

**CREATIVE BREAKTHROUGH EMERGENCE: A CONVERSATIONAL
ACCOMPLISHMENT**

A dissertation submitted

by

Romagne Hoyt Boucher

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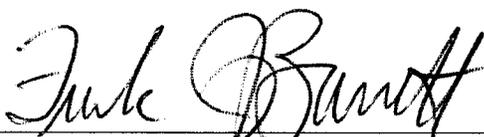
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Abstract

Many people, organizations, institutions, and governments want and need to generate creative breakthroughs and foster creativity, but are not aware of what conversational conditions make their occurrence more likely. The creative collaborative process is dependent upon communication. There have been few studies that have analyzed in situ group creativity with a robust communication theory capable of showing what actual kinds of conversations create new and useful meaning. The purpose of this research was to identify conversational conditions that facilitate creative breakthroughs in collaborative workgroups.

A case study is presented of a 4-month creative collaboration between members of a design consultancy and a senior university design class tasked with designing 21st century communication products for a well-known greeting-card company client. The research design utilized a social constructionist communication theory, the coordinated management of meaning, (CMM). Creative breakthrough moments were identified in three different interactions from questionnaires and videotaped data. Reflective interviews of all the participants also enabled insight into the creative breakthrough moments and the narrative process that developed new meaning. The videotaped conversational patterns that produced those creative breakthrough moments were then recursively examined and analyzed with conversational analysis, CMM research methodology, and figurative language. Six specific conversational conditions were discerned as present in creative breakthrough emergence.

A reflexive pattern of critique, relationship, responsibility, idea generation, and reframing authorship enabled participants to co-evolve design narratives that made new meaning. Creative breakthroughs and new creative meaning emerged from an improvisational structure of six specific conversational conditions. By participating within this improvisational structure, group members utilized critique as a creative springboard for innovation and took fresh perspectives. These findings are counter to the dominant themes in design and sociocultural literature that nonjudgmental conditions, brainstorming, and individuals building on input are the main pathways for creativity.

Key Words: Creative breakthrough, conversational conditions, facilitate, in vivo collaborative workgroups, relational responsibility moves, new meaning-making, improvisational language structure, figurative language, CMM, social constructionist communication theory, creative and generous listening, creative collaboration

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² These names, as all the other names of participants and institutions in this study are pseudonyms to protect their confidentiality.

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Dedication

To the man with the profound heart, whose love and faith enables me daily.

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Table of Contents

Abstract.....ii

Acknowledgements.....v

Dedication.....ix

List of Tables.....xiv

List of Figures.....xv

List of Appendices.....xvi

CHAPTER ONE: THE STUDY.....1

 Introduction.....1

 Background of the Problem.....3

 Statement of the Problem.....11

 Theoretical Framework: The Coordinated Management of Meaning Theory (CMM).....13

 Research Design.....16

 Research Questions.....17

 Key Operational Terms.....17

CHAPTER TWO: LITERATURE REVIEW.....21

 Overview of the Topic.....21

 Theoretical Orientation.....23

 CMM Core Principals.....24

 Key CMM Concepts.....26

 Brief Overview of the Creative Thinking Process.....31

 Historical Logics of Creativity Research.....33

 Collective Creativity in Group Process: Brainstorming.....36

| | |
|---|------------|
| Two Views: Socio-cognitive and Sociocultural Research Traditions..... | 36 |
| Brainstorming Research from the Sociocognitive Tradition..... | 38 |
| Brainstorming Research from the Sociocultural Tradition..... | 44 |
| Sociocultural Literature: Creative Collaboration..... | 46 |
| Key Distinctions of Creative Collaboration..... | 47 |
| Discourse and Dialogic Interaction..... | 51 |
| Improvisation: Conversant Patterns for Creative Emergence..... | 52 |
| Speculative Talk and Listening..... | 63 |
| Metaphor and Analogy..... | 63 |
| Indexicality and Equivocality..... | 72 |
| Creative Listening..... | 74 |
| Design: Creating Shared Meaning That Facilitates Creative Production..... | 77 |
| Historical Logics of Design Thinking..... | 79 |
| Co-Creation and Shared Understanding..... | 84 |
| Specific Communication Patterns Enact Design and Creative Collaboration..... | 92 |
| Summary Core Argument and Research Question..... | 96 |
| CHAPTER THREE: THE RESEARCH PROCESS..... | 101 |
| Characteristics of This Case Study: An In Vivo Creative Collaboration–The Distinctive Greetings Project..... | 102 |
| Background and Rapport Established with Gatekeepers and Organizers of the Project..... | 102 |
| Particular Background Issues of This Case..... | 103 |
| Research Methods and Design..... | 107 |

| | |
|--|------------|
| Research Design and Analysis Basis: Conversational Analysis (CA) and the Coordinated Management of Meaning (CMM) Approach and Heuristics | 109 |
| Participant Selection, Communication, Data Collection, and Management | 112 |
| Participants: Target Population and Participant Selection | 112 |
| Data Collection: Approach and Data Collection Management..... | 114 |
| Data Collection..... | 114 |
| Choice of the Creative Vignettes to Analyze Amongst all the Data..... | 114 |
| Data Management..... | 123 |
| Data Analysis Process..... | 124 |
| First Phase of Data Analysis: A Recursive and Reiterative Process of Conversational Analysis and CMM Descriptive Steps..... | 125 |
| Second Phase of Analysis..... | 134 |
| Third Phase of Analysis..... | 152 |
| Combining Results from the Separate Analyses..... | 153 |
| CHAPTER FOUR: MAJOR FINDINGS..... | 155 |
| Creative Breakthrough Qualifications and Criteria Met..... | 156 |
| Research Methods Used..... | 161 |
| Categories of Conversational Conditions..... | 168 |
| Summary of General Contextual Conditions Found..... | 168 |
| Summary of Specific Conversational Conditions Found-Major Findings..... | 169 |
| Presentation of Findings That Answer the Research Question..... | 173 |
| Finding 1..... | 173 |
| Finding 2..... | 182 |
| Finding 3..... | 187 |

| | |
|--|------------|
| Finding 4..... | 193 |
| Finding 5..... | 197 |
| Finding 6..... | 201 |
| Summary of the Overall Pattern for the Facilitation of Creative Breakthroughs in Collaborative Workgroups..... | 206 |
| CHAPTER FIVE: DISCUSSION AND CONCLUSIONS..... | 210 |
| Overview of the Results of This Case Study..... | 210 |
| Theoretical Proposition: The Creative Collaborative Conversational Model and the Literature Discussion..... | 215 |
| The Cognitive-Social-Affective Dynamic of the Model..... | 221 |
| Reflection Back to the Core Scholarly Conversation..... | 225 |
| Summary of the Core Literary Discussion..... | 249 |
| Reflections on the Method, Its Use, and Qualifications on the Conclusions of the Study..... | 249 |
| Reflections on Methods and Usefulness..... | 249 |
| Qualifications on the Conclusions of the Study..... | 255 |
| Further Research..... | 261 |
| Implications for Practice..... | 266 |
| Designers of Conversations..... | 267 |
| Final Remarks..... | 271 |
| REFERENCES..... | 272 |

List of Tables

| | |
|--|-----|
| Table 1: Range of Improvisation..... | 54 |
| Table 2: Codesign and Cocreation Distinctions | 86 |
| Table 3: Protocol Question and Targeted Dimension of Conversational Conditions..... | 120 |
| Table 4: Meaningful Association Matrix..... | 129 |
| Table 5: Preliminary Analysis Phase and Placeholder Theme Process Per Data Event..... | 133 |
| Table 6: Critical and Practical Concerns of a CMM Analysis..... | 137 |
| Table 7: CMM Eight Research Steps in Four Functions..... | 139 |
| Table 8: Heuristics and Characteristic Questions of CMM Research..... | 143 |
| Table 9: Terms and Heuristics per Methodology Used for Analysis..... | 146 |
| Table 10: Evidence of Creative Breakthrough Criteria from Communication Process..... | 160 |
| Table 11: Summary of the Analysis for Creative Breakthrough Emergence of the Three Vignette Episodes..... | 163 |
| Table 12: Improvisational Conversational Structure for Creative Breakthrough Emergence: An Overview of the Distinctive Patterns That Emerged Using the Improvisational Language Nodes..... | 208 |

List of Figures

| | |
|---|-----|
| Figure 1: Possibility of Contextual Influence for Individuals and A Group in Interaction..... | 30 |
| Figure 2: Overview Visual of Data Analysis and Synthesis Process of Distinctive Greetings Project..... | 125 |
| Figure 3: Example of Conversational Analysis Coding Legend and Partial Transcript..... | 128 |
| Figure 4: Dora’s CMM Simple Conversational Map..... | 131 |
| Figure 5: CMM Flexible Hierarchy Model Showing Social Practices, Resources, and Forces..... | 135 |
| Figure 6: Depiction of Social Force Influence on Meaning (Context) and Action..... | 145 |
| Figure 7: Relational Responsibility Build..... | 189 |
| Figure 8: Relational and Responsibility Moves Facilitated Critique Incorporation and Ownership..... | 191 |
| Figure 9: Creative Collaborative Conversational Model..... | 218 |
| Figure 10: Creative Breakthrough Conversational Patterns and the Interpersonal Human Creative Process..... | 224 |
| Figure 11: Evaluative Criteria for Constructionist Case Study Research, based on (Chen & Pearce, 1995, pp. 140-15)..... | 254 |

List of Appendices

| | |
|--|-----|
| <u>DATA GATHERING AND MANAGEMENT</u> | 299 |
| Appendix A: Email Invitation to Participate..... | 299 |
| Appendix B: Informed Consent..... | 305 |
| Appendix C: Research Staff Confidentiality Agreement..... | 309 |
| Appendix D: A Reflective Questionnaire..... | 310 |
| Appendix E: Interview Protocol–Organizers of the Distinctive Greetings Project..... | 311 |
| Appendix F: Group Educational Session–The Distinctive Greeting Project Active Participants..... | 312 |
| Appendix G: Final Interview Protocol–What Was Learned..... | 315 |
| Appendix H: Copyright Permissions..... | 402 |
| <u>DATA ANALYSIS</u> | 327 |
| Appendix M1a-M1c: CMM Simple Conversational Maps (Serpentine, Hierarchy of Contexts) of Bailey, Dora and Samantha Interactions..... | 317 |
| Bailey..... | 317 |
| Dora..... | 324 |
| Samantha..... | 328 |
| Appendix M2a-M2c: CMM Complex Conversational Maps (The Simple Maps with the Additional Analysis of Bifurcation Points, Logical Force, Creative Breakthrough Moments) of the Bailey, Dora, and Samantha Interactions..... | 334 |
| Bailey..... | 334 |
| Dora..... | 340 |
| Samantha..... | 344 |

| | |
|--|-----|
| Appendix T1: Conversational Analysis Transcript of the Dora Interaction, April 11, 2012..... | 350 |
| Appendix T2: Conversational Analysis Transcript of the Samantha Interaction, April 20, 2012..... | 359 |
| Appendix T3: Conversational Analysis Transcript of the Bailey Interaction, April 27, 2012..... | 371 |
| Appendix CAS: The Cognitive, Affective, Social Discussion..... | 383 |

CHAPTER ONE: THE STUDY

Introduction

On Creative Endeavor: Creativity encompasses the processes leading to the generation of new and valued ideas. (West, 2002, p. 357)

For most people, the word *creative* means something that is encompassed in the dictionary definition; original, novel, imaginative, inventive, or innovative, as well as resourceful and ingenious (Abate, 1999, p. 222). In traditional psychological creativity scholarship, creativity is considered to be about an individual and his or her mind--in other words--special, innate, highly selective, and only of or for the few (Robinson, 2010). For others, being creative is possible only in the context or company of others who by “negotiating and constructing shared understanding in...a fundamentally social and collaborative process...take each other over the edge of what you individually thought you were capable of” (Miell & Littlejohn, 2004, p. 2). Although there are numerous definitions for creativity from creativity scholarship, with various nuances placed within those definitions on person, place, product, or process, there is an agreement that *creative* is distinguishable as something that is novel or original and valuable or useful (Amabile, 1982; Baruah & Paulus, 2009; Csikszentmihalyi, 1996; Paul B. Paulus & Brown, 2003; M.A. Runco, 2008; R. K. Sawyer, 2007; Sternberg, 2009; Woodman, Sawyer, & Griffin, 1993).

Many people, organizations, institutions, and governments want and need to generate creative breakthroughs, but are not aware of what conditions make this dynamic more likely. A common understanding of breakthrough is a departure from the familiar, normal, or expected in an endeavor, line of products, procedure, thinking, or sets of behavior. The concept of creative breakthroughs will be developed and examined throughout this study. According to a social constructivist view, conditions are created reflexively during

interactions amongst people and with their environments through language acts. With increasing regularity, the creative process in many fields is being accomplished through workgroups, not single actors. However, only some collaborative workgroups are effective enough in their communications to allow creative breakthrough moments to occur and achieve both the group's creative challenge and satisfaction in their collaborative practice. What kinds of reflexive conditions and communication patterns facilitate breakthrough moments in creative collaboration? Robert Hargrove (1997) defined creative collaboration as follows:

[an] act of shared creation and/or shared discovery; two or more individuals interacting to create a shared understanding that none had previously possessed or could have come to on their own. Collaboration creates a shared meaning about a process, product or an event. (Hargrove, 1997, p.13)

Greater collaborative and communicative skills are required for three reasons:

1. Worldwide markets are more competitive, changeable, interconnected, and shifting in their social compacts, making the external pressure to be creative and innovative together greater than ever (W.G. Bennis & Biederman, 1997; Warren G. Bennis & O'Toole, 2009).
2. Management and employees are expected to generate novel and useful ideas and solutions in temporary teams instead of stable workgroups who have longevity of purpose and repositories of trust, routine and relationship invested.
3. People need a sense of psychological safety to freely engage, create together, and expand the context for possible solutions, as well as generate creative processes and products that will meet the demands of the pressure to innovate (Amabile, 1996; Anderson & West, 1998; Scardamalia & Bereiter, 2006; Searle, 2004; M. A. West, 2002).

Background of the Problem

Interactive creativity. Teresa Amabile (1982) broke new ground in creativity scholarship and expanded the notion of creativity as a social psychological concern when she questioned how an endeavor, product, or process was assessed to be creative. She said that, “a product or response is creative to the extent that appropriate observers independently agree it is creative” (Amabile, 1982, p. 1001). This took the notion of creativity out of the individual unit of analysis and established an interactive and sociocultural context by stressing that the appropriate observers have to be ones that are familiar with the domain of endeavor (a social space) and are dependent on the same kind of feedback and interaction (a social process of communication). Creativity was performed in a construction of communication because it had interactive elements. The two views of creativity encapsulate one of the main scholarly debates in creativity scholarship: Is creative cognition inherently individualistic within a uniquely gifted person’s mind or is it more a function of socially interactive phenomenon, or more to the point, do social processes inhibit or impede the creation of the new? Critical concerns in the debate address whether the pull for consensus and the unwillingness to voice dissent out of fear of reaction stifles creativity (e.g., group think). The scholarly debate mirrors the inherent tensions of humanity that underlie it; human beings are at once both individual and social, and the phenomenon of creativity resists confinement and happens through expression.

Leonard and Swap (1999) built upon Amabile’s definition: “Creativity is the process of developing and expressing novel ideas that are likely to be useful” (Leonard & Swap, 1999, p. 6). This definition has four distinguishing aspects. First, there is the recognition that creativity requires a divergent thinking process. Second, the often uncomfortable aspects of

letting go of the familiar to experience and perceive differently is important to the generation of novel ideas. Third, there is the idea that letting go includes moving ahead with abductive and inductive perspectives so as to be useful in coming up with many ideas in the early stage of the creative process. Finally, the ideas must be expressed to ensure that they are novel to others and can be refined.

No act of communication is complete until responded to, and even then, it is open to additional management of meaning by further responses. Workgroups and design teams are often involved in assessing the potential usefulness of novel ideas, not just in terms of their own group reactions, but in an imaginative stance as to how other audiences will respond, such as immediate and end-user clients (Bauman, 1995; W. B. Pearce, 2007). Without the proceeding confirmation or disconfirmation, generated ideas could just occur as strange, weird, invisible, or go unnoticed altogether. Interaction and feedback not only sharpens the assessment that a particular idea has something more to offer than others, but also aids in the selection of which ideas to pursue through implementation. Interactive feedback and selection join in a collective convergent thinking dimension so as to choose and commit for implementation. Finally, the selected idea(s) must address the initial problem posed and show that it is a useful solution for that problem.

Why choose small groups? A lot of organizational work gets done in small group interactions, whether the work is for the meta, macro, mezzo, or micro purposes of an organization. I situate my study at the small group level because concerns and decisions about the future of an enterprise (and often individuals) happen there.³ Since small group

³ Large and small decisions that form the future of the enterprise can happen from many kinds of groups in various kinds of communicative settings. There are 'in-tact' groups such as the Board of Directors, senior executive leadership teams, senior teams, and different levels of management teams who may discuss and decide on strategy, future planning, operational progress, project formation, and various forms of development

organizational interaction can happen around a variety of issues, challenges, and opportunities that require action and results, group's ability to cocreate shared meaning, coherence, and coordination is critical. I focus on the heart of these discursive events: a group's ability to share and exchange ideas that could aid a particular problem or opportunity.

Small group collaboratives or collaborations? All kinds of workgroups are collaborating for advances in their specific domains—scientists for the production of knowledge, design teams and workgroups for product and service offerings, managers and leaders for organizational design. Numerous combinations of intra or interorganizational entities get together to generate and design new futures and solutions in an increasingly complex and interconnected environment (Hara, Solomon, Kim, & Sonnenwald, 2003; Kirkman, Mathieu, Cordery, Rosen, & Kukenberger, 2011; Moran & John-Steiner, 2003). These realities underline Sonnenburg's (2004) observation, "Most creative acts occur in a collaborative context" (Sonnenburg, 2004, p. 254).

Walter Swap's (1984) definition of *group* formed the first foundational layer of the notion of a workgroup, as cited in Leonard and Swap (1999): "A group may be thought of as two or more people, existing in an arrangement that permits some degree of interaction and sharing some sense of identity as members" (Leonard & Swap, 1999, p. 8). This means that a group cannot consist of people who may have a common mission but do not interact (e.g., haters of former owner of the LA Dodgers, Frank McCourt) or those who interact but do not have a common mission (e.g., acquaintances at a dinner party). The kind of interaction does

(e.g., product, process, project, or person development), progress assessment, and project or product feasibility (Flores, Letelier, & Spinosa, 2003; Hamel & Prahalad, 1989; Shalley & Zhou, 2009; C. E. Smith, 1994). Increasingly, innovative projects, directions, and projects are being addressed by ad hoc groups who use 'teaming' principles to accomplish previously impossible tasks that in turn shape the future of an enterprise (A. Edmondson, 2012; A. C. Edmondson, 2012).

not make or break the group (e.g., face-to-face, over the Internet, conference call) nor does the duration of the interaction or the size of the group. Not all collaborative groups are engaged in creative process (some exist to make decisions or to resolve conflict or issues), but in this study, the focus will be on collaborative workgroups that have a creative purpose as a basis for their existence.

Just what does *collaborative* mean? For scholars and practitioners, usage of the word can denote so many different variations of working together in a social way. It could refer to processural or active events, such as offering assistance, critique, composition, idea generation, and cooperation with coordination, or it could be the name for the structure of social groupings like partnerships, alliances, teams, bona fide groups, normative groups, and the process of “teaming.”⁴

There is confusion about what *collaboration* means, “Collaboration researchers variously propose that the phenomenon is both a structure for and the process of ways in which organizations and communities work to resolve common problems and explore new ideas” (Keyton, Ford & Smith, 2008, p. 377). I suggest that *collaboration* then refers to structure and a context, whereas *collaborative* refers to interactive processes between what is said and how sociocultural norms and sociocultural contexts are accessed. I direct the reader to an elaboration of structuration theory that supports this suggestion (Howard, 1988).

In this study, the term *collaborative workgroups* has a process connotation, and is defined as two or more persons who have chosen to interact for a common purpose, over time, with a resourceful relationship in a small group (typically less than 12) to produce

⁴ Teaming can include a range of group functions dependent on the organizational and sociocultural norms in use; for instance it can be thought of in categories of action such as forming, storming, norming, and performing; or more simply as the processes by which a team establishes its purposes and requirements for their work, improve processes of action, coordination, and correction so as to better perform and produce desired results.

results that are novel and useful at this point in time. The collaboration in this study refers to the contextual social structure consisting of power, interpretive schemes, and norms as it is reflexively reproduced in practices (Giddens, 1993 ; Howard, 1988).

Characterization of conditions: Around levels of interaction. Group interactive conversational conditions are of a more general descriptive nature, such as group structural conditions and group climate conditions. These are influential in how group members interact in a microcontext with the specific instances of give and take in dialogue that construct creative episodes. For instance, a group with a creative purpose might be exchanging and recombining ideas. Who speaks, when, and about what aspect of an idea or the intention a speaker has to push the idea to its limits may be influenced by how comfortable and free the speaker experiences the group climate before he or she takes a risky “turn” in communication. The group members might be involved in a specific sequence of turn-taking by adding to and recombining elements of a creative idea in a group climate condition of participative safety. The specific sequences of turn-taking may be named an improvisational episode within an overall group climate/conversational condition of participative safety, or appraisal and refinement. Also, the group may evidence different improvisational episodes that could be thought of as patterns of conversational episodes that can constitute the group conversational conditions. This study primarily focused on the group interactional conversational conditions (meso) and the specific conversational conditions of collaborative workgroups (micro).

Creative breakthroughs and innovation. External demands to create and implement degrees and levels of novelty that go beyond incremental improvement may combine in such a way with human development as to create a broader and temporal context

for rising to the occasion. Borrowing from Erikson's concept of generativity, individuals and groups have joint intrinsic and psychosocial needs to contribute to something beyond themselves--productivity--as well as to become intimately connected with work and other people to create something new--creativity (Erikson, 1963). To do that, people need to be able to have more ability to open, connect, disassemble, combine, and re-combine ideas and experiences from diverse knowledge bases so they continually expand the horizon of possibility.

Desktop computers. Land-line telephones. Greeting cards (and the USPS). Celluloid cameras. Each of these once dominant products (and service in the form of the USPS) is now almost anachronistic, shuttled aside by laptops, electronic notebooks, smart-phones, e-Cards, the Internet, and digital cameras respectively (Rouvray, 2011). Chandy and Tellis's (1998) taxonomy of innovation based on technological newness (vertical axis) and customer need fulfillment per dollar (horizontal axis) identified four types of innovation: incremental, market breakthrough, technological breakthrough, and radical innovation.

Not every designed innovation is targeted for breakthrough or radical products or services. When scholars and practitioners⁵ offer new perspectives, processes, theories, or strategies for innovation, they often intend to create new possibilities for use in the future. Market and technological breakthroughs contribute to dissatisfaction with old standards, and in cases of technological breakthroughs, the new standard of satisfaction is assessed as essential to the user. An example of this would be "just in time" inventory control processes

⁵ Practitioners in this study will refer to the design professions, design consultancies and organizational consultancies and consultants that use concepts from design thinking as part of their repertoire. Scholar-practitioners refer to those professionals who centralize their focus on both the production of new knowledge and the practical applications of evidence-based, or research, approaches.

and distribution.⁶ Radical innovations open a new reality of possibilities for thinking and action that many people, not just users or customers, have to deal with to survive and be successful in the work world. The adoption of the automobile, telephone, television, and computer all created new economic and professional realities as well as social and emotional realities, which are characterized by increasing openness and multiplicity of ideas flowing, connecting, and colliding in unregulated channels (Johnson, 2010).

A view of creative breakthroughs. In organizational and innovation literature, there has been more research on breakthrough creativity than from the sociocognitivists. This is primarily because creativity has been considered and measured as a unitary construct in the sociocognitivist literature, whereas socioculturalists recognize that the creative moment and breakthroughs may be associated with more than just the cognitive dimension (Gilson, Lim, D'Innocenzo, & Moye, 2012). Unsworth (2001) questioned whether various work processes and antecedents facilitate or hinder radical idea generation while others engender only incremental improvement ideas, as the type of creativity (radical or incremental) may have different drivers. Sternberg (1999) argued that creative contributions move in terms of magnitude move (level) and direction from existing knowledge (type), and identified seven different forms associated with it in the case a field moves in an already existing direction or is redirected (Sternberg, 1999). Gilson et al. (2012) defined radical creativity as

[P]redicated upon the generation of new ideas that are revolutionary to a field, are risk taking in nature, and focus on experimentation and paradigm shifts...and incremental creativity is focused on finding new applications for existing methods, processes, or products, and adapting what is currently done. (p.171)

⁶ “Just in time” inventory controls and processes allowed retail outlets and manufacturing and distribution units of supplying organizations to so closely coordinate supply and demand of products that retail outlets no longer had to stockpile inventory, thus enabling better cash-flow management, physical space requirements, and personnel scheduling for both suppliers and retailers.

Creativity requires conditions for divergent thought and interaction. Yet the identification of creative breakthroughs by a group is more a convergent phenomenon than a divergent one. Group members converge when they see that the particular idea, alternative, or possibility under group consideration is a likely candidate for implementation because of its novelty and value. “Breakthrough” then could be thought of an energetic transition or integration, perhaps both of divergent conceptualizations as well as a convergence of group process. Despite all the attention creative idea generation has received and from a variety of great thinkers,⁷ there is not a single commonly accepted definition for *breakthrough* by scholars in cognitive studies, psychology, social psychology, or organizational creativity. However, eureka moments, which can be construed as breakthroughs are most associated with the creative insights and understood to be the observance or report of a transition from a former conceptualization to some other more appropriate interpretation in a sudden flash or opening that yields a novel, useful, and somewhat surprising idea (Cross, 1997, 2001a).

A moment or interactive episode is characterized as a breakthrough not because it has proven or will prove to alter the domain or field for which it is intended. Rather, a group begins to see the shimmer of a breakthrough in the shared creative and interactive moments that have yielded emergent possibilities such that group members begin to say, “this is beyond where we have thought before, and this could work!” Those kinds of insights could be available in idea sharing, generation, and refinement (which may involve critique, challenge, feedback, and recombination) as well as in a convergence of thought or realization that a certain idea or conceptualization is a candidate for selection that could lead to implementation.

⁷Some of the great thinkers include Coleridge on recollections drawing together beneath the surface, Einstein on combinatorial play and Poincaré on colliding ideas (Mednick, 1962, p. 220).

Singh and Fleming (2010) said that “breakthroughs are more a social phenomenon [than cognitive]...” (p. 47), and this view is also shared by other scholars (Baer, 2010; Fleming, Mingo, & Chen, 2007). Scholars from psychology, organization theory, anthropology, and linguistics hold the view that thinking, cognition, and its products (e.g., knowledge and creative outputs) are social processes whose genesis is in partnerships and group collaborations (Bruner, 1991; Cole, 1991; Gray, 1989; Vera John-Steiner, 2000; Levine & Moreland, 1991; Levine, Resnick, & Higgins, 1993).

One of the primary ways both creativity and collaboration are enacted is with language and conversations. Therefore, inquiring about the facilitation of creative breakthroughs in group situations involves the study of how conversational language shapes the breakthrough moments. These moments result in a creative breakthrough idea that could be made or implemented as a product, service, or process. It is not my purpose in this study to link the facilitative conversational conditions with the levels of creative output, which would require third party verification, however, creative work studied in this tradition is epistemologically grounded in a sociocultural context of persons, group, domain, and field (Csikszentmihalyi, 1988).

Statement of the Problem

Taking a communication perspective on the creative collaborative process.

Tacitly and explicitly, scholars agree that the creative collaborative process is dependent upon communication in the forms of inquiry, dialogue, and discourse (Burr, 1995; Carpenter, 2006; John-Steiner, 2000; Pearce, 2007; Pearce & Carpenter, 2007; Sawyer, 2004a, 2004b, 2007, 2002). There is agreement amongst communication scholars that the research in that field is undertheorized and underdeveloped (Keyton, Ford, & Smith, 2008; Miell & Littlejohn, 2004). Mattessich et al. (2001) even highlighted communication as constitutive of

coordination and cooperation, whereas Pearce and colleagues have shown that taking a communication perspective and dialogic practice unites personal change, coordination, cooperation, conflict, coherence, mystery, compassion, and learning (Barge & Pearce, 2004; Cronen, Pearce, & Tomm, 1985; Mattessich, Murray-Close, Monsey, & Foundation, 2001; Pearce & Pearce, 2000). Group creativity (psychology) scholars do not treat the communication practices as anything but vehicles for message content. Few creative collaboration or design scholars have offered in vivo studies that address the need for increased creative collaborative acuity in the workplace from a constructivist communication perspective, and instead have treated communication in the dominant paradigm as a transmission medium or modality of cognitive process.

There has not been a single study that has analyzed group creativity or creative collaboration with a robust communication theory that is capable both of providing access into action as well as the simultaneous narrative creation.

Purpose and significance of study. The overall purpose of this study is to discover and contribute knowledge about the actual conversational practices (what people actually say and do) in the social world of creative collaboration—specifically--what communicative, contextual, and interpretative conditions are present when a design process is engaged, and what creative breakthroughs occur and are then built upon by a collaborative workgroup.

Communication scholars note that there is a paucity of research on collaboration from observation of collaboration in naturalistic settings (Lewis, 2006). Although I will draw upon the wisdom of in vivo studies conducted by previous scholars (Dunbar, 1997b; K. Sawyer, 2007; Sawyer, 2004a; Sutton & Hargadon, 1996), there is a lack of in vivo studies of group creativity in the field of organizational creativity that take a social constructionist

perspective, and none that link a robust communication theory, like the coordinated management of meaning theory (CMM), and group creativity.

For practitioners like consultants, coaches, managers, project managers, and educators, further understanding of what it takes for a stressed workgroup to effectively shift to a discrete set of creative communication practices could create better overall conditions for successful outcomes. Furthermore, there is a lack of communication models for replicable communication collaborative processes in general, and none for creative breakthrough generation. While each workgroup and creative situation is unique, both scholarship and practice would be enriched from a better understanding of how communication can facilitate creative breakthroughs.

Theoretical Framework: The Coordinated Management of Meaning Theory (CMM)

Research on group creativity, creative collaborations, and innovation pays lip service to the centrality and importance of communication. In the process of creative collaboration, people are engaged in generating and expressing ideas, building upon ideas, and critiquing ideas. They then choose, refine, and shape them into a plan for implementation.

Communication and its characteristics are elemental not only to those meaningful processes but also to the intended outcomes. It is surprising then that the research does not actually draw upon any sophisticated communication theories to analyze these creative collaborative processes. In order to study the complexity of the creative collaboration process, a robust communication theory with the ability to capture its complexity is needed—a communication theory that places equal emphasis on coordinated action and meaning making in the process of creation. For this, I recommend and utilize the coordinated management of meaning communication theory (CMM).

CMM is a social constructionist, practical theory developed in the late 1970s by Barnett Pearce and Vernon Cronen. It examines how communication makes or creates social reality, which is congruent with this study on the creative collaboration process and creative breakthroughs (Giddens, 1979; W. Pearce, B., 2009). CMM describes communication as a double-helix process of coordinating actions and making and managing meaning. As in a helix, the double strands are inseparable but distinct. Coordinating action occurs in the world of events, while making and managing meaning occurs in the realm of stories.

CMM differs from other theories that highlight the linguistic turn by its emphasis, first by discerning the what, who, and how of coordinating actions from the world of events, and then looking at the stories that illuminate, interpret, and inform those actions (W. B. Pearce, 2006). CMM's communicative perspective is about looking at, rather than through, communication. Communication acts (spoken words, gestures, images) are real and constitute experience of social worlds. Communication is not simply a representational instance, where words and phrases are used "about" something, rather, words, phrases, and utterances are things, and they are speech acts that *do* something (Hosking & McNamee, 2007; Winograd & Flores, 1987). Communication is not only a way of expression –it is a doing, a making, a creating. The overarching questions from the CMM communication perspective are the following: (a) what are we making; (b) how are we making it; (c) are we becoming better in the process; and (d) how can we make better social worlds? This communication theory, with its developed heuristics⁸ for investigating the narratives that

⁸ Pearce offers interpretative frameworks to aid persons discovering the social constructions of meaning that are engaged while in conversational dialogue, and calls them heuristics (Pearce, 2007). Amabile uses the term heuristic to indicate an interpretative framework set that is broken when creativity emerges in a range (Amabile, 1996).

constitute our social reality, is more explicative of “what we are making” both in structure and in meaning (Ferreira & Santos, 2011; Hymes, 1964; Johnstone & Marcellino, 2010).

By taking a communication perspective on what is actually said and done in the analysis of a design workgroup, collaborative interaction could be understood more effectively from two viewpoints. The structure of the coordinations and how they reference various contexts and meanings would be better understood. The structural understanding would also then enable an awareness and understanding of the kind of social world the process that the structural world in turn creates. With awareness of the meanings that are made and managed within that collaboration associated with the specific patterns of saying and doing, CMM research can better document, describe, and point to the shifts in the taken-for-granted notions of what is possible and what hinders the social world of design collaboration. In creative workgroup interaction, often two or more intrapersonal logics of meaning and action are communicated, and therefore new (intrapersonal) logic can emerge (Giddens, 1984). CMM better enables investigation of the conversational conditions that facilitate both the generation of creative breakthroughs as well as provides a way to understand how they could be implemented in the social action of collaborative workgroups, where great ideas typically get bogged down.

CMM theory and research have been used to investigate collaborative practice in a hospital unit (Raboin, 2010), in a multi-agency collaboration for child and mental health services (Salmon & Faris, 2006), as decision-making in consumer research (Sonnentag & Volmer, 2009), and in fulfilling the learning and development potential in an interprofessional education curriculum of an acute care hospital (Burleson, 2005). In each of these studies, communication was seen as a cocreative process in which people create,

manage, and transform the social reality in which they live. Cocreation is increasingly becoming a fundamental principle of innovation and design practice, not only amongst multidisciplinary design team members, but also with clients and essential parties to the design (Eneberg, 2011; Mattelmäki & Visser, 2011). CMM can therefore produce a more insightful understanding of the structure and process of creative breakthroughs by placing those instances within the broader context of a design workgroup's social reality as well as provide a more complex understanding of the creative power of communication.

Research Design

Unlike the literature on breakthroughs addressing products of creative collaboration, as elaborated by Chandy and Tellis (1998), or the big eureka moments of individual genius creators, this study focused more on a group's ability to see differently or recognize new information and generate ideas based in possibility. The process of recognition, possibility generation, and recombination offered the group more resource conditions for creative breakthroughs, new pathways for action, and new social worlds. My curiosity was around the process of translating ideas and possibility into reality, and the interactions that made that happen. As my research design focused on what is said and done in conversations to facilitate creative breakthroughs and collaboration, the question as to what particular conversational conditions facilitate creative breakthroughs was answered.

This was a case study designed to investigate the conversational patterns that facilitated creative breakthroughs and creative collaboration in a narrative analysis that utilizes CMM theory and research methodology, as each are uniquely suited to explicate discourses and process. The narrative analysis was conducted on the data collected from the

recorded sessions between members of a design consultancy, C4, and senior design students in a New York state university, Levenger, over the course of a semester.

The project between C4 and the Levenger senior design class was for the Creative Director of an established creative greeting card corporation (over 100 years in existence), the Distinctive Greetings Company. The design brief was not an explicit request for a breakthrough product, yet the context of this project could imply a technological breakthrough in a new kind of narrative for the greeting card business. Greeting cards as tangible tokens of relationship and meaning are an endangered species and may not be the future of this particular greeting card corporation. The design brief called for personal mementoes of a relationship bridged or mended that will go beyond greeting cards for the 21st century (exact wording of design brief available in Chapter 3).

Research Questions

Given the background, significance, and conceptual rationale in this research study, I conducted a narrative analysis of selected segments of a workgroup's design sessions and to answer these questions, with the first as primary to my inquiry:

1. What conversational conditions facilitate creative breakthroughs in collaborative workgroups?
2. What do people say and do that facilitate creative acts and creative episodes? What patterns emerge?

Key Operational Terms

The following key terms ground this study in a conversational analysis and conceptual metaphor theory context within social constructionist traditions.

- **Communication:** A process in which people collectively create and manage social reality. "Talk" includes verbal and nonverbal gestures, indications,

utterances, body language, tonalities, and cadences. Communication is uniquely human in that language use gives flexibility and creativity, relational in that meaning is a shared social interdependence, creative in that naming causes existence, and managed and regulatory in that we can act on the world with communication (Trenholm & Jensen, 2013, pp. 5-8).

- **Conversational Condition(s):** In the particular, a condition has been defined as a stipulation(s) – something upon the fulfillment of which something else depends, and something that is essential to the working or functionality of something else (Abate, 1999). Conditions can be thought of as the contextual resources that shape actions and meanings and are explained as “stories, images, symbols, and institutions that persons use to make their world meaningful” (W. B. Pearce, 1994, p. 23). As explained earlier, in this study, conversational conditions are characterized on two levels:
 1. One level indicates a more general interactional condition that describes or names the whole of a group interaction or contributes to it, such as a group structural condition or a group climate condition. Examples of general group interactive conditions could be thought of as conflict and its variations, disagreement, withdrawal, tension, diversity, social cohesion, psychological safety, moods, anger, dissent, or debate.
 2. The other level, specific conversational conditions, refers to the immediate and specific language acts and episodes that comprise an interaction that show a give and take of what is said and what is heard and then said. Specific interactive conditions refer to the pattern of communicative action (speech acts and episodes) that is propelled by meaning. An example of a condition might be clarifying questions about the design brief and the minimal requirements for satisfying the client, speech acts not only designed to clarify meaning but also from certain levels of understanding.
- **Facilitate:** To make something more easily achieved; to help, aid, or advance.
- **Creative Breakthrough:** A set-breaking heuristic through an obstacle, way of thinking, being, acting, or pattern of action or interaction for accomplishment. In this study, a creative breakthrough is not simply a sole individual occurrence. It

could characterize an episode or pattern of “mini-eureka” moments where a workgroup recognizes and remarks upon the group’s shift towards something novel and useful, accompanied by a new opening for being or acting that involves choice (Cross, 1997, 2001a). This is similar to those critical moments that Pearce describes as bifurcation points where an individual or a group have the opportunity to choose their action and meanings made in the next communicative act he, she, or they make (W. B. Pearce, 2007).

- Collaborative Workgroup: Three to eight persons engaged in a set of communicative processes who choose to work interdependently to address problems or accomplish goals that are outside the reach of individuals or groups working alone. The results of these processes have the potential to help or hinder the parties (and others) related to project (Keyton, Ford, & Smith, 2008).
- Collaboration: A relationship chosen by two or more parties that is entered into for mutual benefits to achieve common goals with a jointly developed structure and a shared responsibility for success, sharing, and rewards (Mattessich, Murray-Close, & Monsey, 2001).
- Creative: An idea or response that is novel or original, useful or functional, and non-obvious or surprising, requiring heuristic generativity (Sonnenwald, 1995).
- Figurative Language and Speculative Talk: To speculate means to form a theory, concept, idea, or conjecture without firm factual basis. Speculative talk means to combine or recombine ideas or conceptual constructs, guess, put together concepts or ideas from disparate domains, question, challenge, or wonder in speech (acts, episodes and patterns). In design, speculative talk and figurative language use also includes physical forms that accompany speech (such as drawings, models or prototypes). An example of figurative language is an analogy, metaphor, or purposeful juxtaposing of seemingly oppositional ideas for the purpose of generating a new heuristic, such as “an air pump shoe,” which a design consultancy once proposed to Reebok (Lehrer, 2012) to enable a basketball player to “fly” from a shoe’s support (something grounded).
- Creative Listening: An appreciative form of listening and attentiveness given by one person to another so as to validate, add, or advance the essential

characteristics of an idea that is articulated to support action upon the idea. In this study, examples of creative listening would be deliberate use of “yes...and”, an improvisation principle, as well as “plus-ing”, which is to purposively add to an idea/concept or ‘building’ on something with associated descriptors in the seeking to construct further meaning and action. Creative listening does not have to be positive—the essential characteristic is to further, extend, expand, or build upon the ideas of another. If a group senses or has seen patterns of creative listening, they are more apt to challenge, venture, and propose ideas (R. K. Sawyer, 2007).

CHAPTER TWO: LITERATURE REVIEW

Overview of the Topic

The focus of my study is collaborative workgroup creativity and what conditions combine within a group to facilitate the emergence of breakthrough moments, followed by the alignment of the group to endorse a particular idea in creative group process. Workgroup creativity is essential to organizational innovation, and groups often face enormous communicative and contextual challenges. Because of the complexity of the business climate and public life, idea generation and implementation for complex and interconnected problems is most often accomplished by diverse workgroups in organizations. Innovation has been defined as the “successful implementation of creative ideas within an organization” (Amabile, Conti, Coon, Lazenby, & Herron, 1996, p.1155). The conditions for idea generation as well as the ability to implement creativity have been studied within organization creativity and innovation scholarship (Craft, 2005; Mumford, Hester, & Robledo, 2012; Shalley & Zhou, 2009; Sternberg & Lubart, 2009). However, the conditions for collaborative group breakthrough idea generation and alignment for implementation have been little studied.

These workgroups increasingly have to perform through multiple levels of interaction in cross-boundary constructs. In present day, workgroups represent more diverse backgrounds and knowledge bases than workgroups that were studied in creativity research in the first half of the 20th century (Johnson, 2010). Amabile (1996) pointed out that creativity is a necessary but insufficient condition for innovation, and innovation depends upon teams, units, or organizations to translate the creative ideas into reality. In order to be able to successfully implement creative ideas, the group must converge in commitment to particular concept crystallization of creative ideas. The ideas must add novelty and value

beyond what is customary. Idea development and communication need further refinement so that the implemented idea is successful. These refinements, developments, and communication strategies are organizational implementation investments. Therefore, the power and effectiveness of groups for effective creative and innovative endeavor, and the importance of breakthrough moments and ideas, are not to be undervalued (Leonard & Swap, 1999). The majority of the creativity scholarship has focused on an individual's cognitive processes and divergent thinking for creative outputs. Convergent thinking as a group creativity process (and not a decision making process) has been little studied (Mark A. Runco & Sakamoto, 1999; Ryhammar & Brolin, 1999).

Creative breakthroughs have been associated with three group processes known for spurring creativity: brainstorming, creative collaborations (as in improvisational performance or the creation of new scientific knowledge), and in creative fields that depend on a regular production of new ideas, such as design--specifically new product development for organizational innovation. In this chapter, I will discuss salient studies on group ideation, taken from those three areas from the disciplines of psychology and social psychology: small group communication research, innovation and organizational behavior, and design practice literatures. More than 150 sources of research have been surveyed.

After a brief general discussion of the theoretical orientation of this chapter and the creative thinking process, the literature review will be organized into four subsections consistent with group, interactional creativity: (a) a discussion of collective creativity as viewed by social psychology literature (a focus on brainstorming), (b) a discussion of the conditions necessary for the creation and sustenance of creative collaborative group process from a multidisciplinary literature (the creative collaboration literature), (c) a discussion of

the kinds of speculative listening and talking that has been noted to facilitate creativity (e.g., metaphors, analogies), and (d) conditions that shed light on how groups create shared meaning in language practices used in design (design literature).

The specific conversational conditions and group interactional conditions could be thought of as the micro features of group interactions. Burr (2003) distinguished two forms of social constructionist theory and called discourse analysis of a conversational condition or interaction micro social constructionism. She contrasted microsocial constructionism to macrosocial constructionism, as macro social constructionism concerns itself with macro linguistic and social structures as the predominant contexts that frame and imbue meaning for social and psychological life (Burr, 2003, p. 20).

Microfeatures of group interactions have a reflexive relationship with the macro conditions for creativity and innovation based in structuration theory and social construction (Berger & Luckmann, 1967; Burr, 2003; Giddens, 1984). Because the general context of business today is greatly shaped by the same conditions that stimulate creativity and innovation, namely turbulence in technological development, market demand, and in commercial and social environments (Mumford et al., 2012, location 480), I think a more granular study is timely, appropriate, and warranted.

Theoretical Orientation

The discernment of contextual influence in various aspects of the creative process has been problematic for scholars, as group creativity is a multidimensional and contextual phenomenon. As mentioned in Chapter 1, I offer the coordinated management of meaning (CMM) as a robust communication theory for analysis of the collaborative processes that constitute creative collaborations and the design process. By taking the communication

perspective of CMM, we acknowledge communication as a creative process. One of the central motivating questions of this theory is "What are we making?", a question that opens the door to looking at patterns of communication. This question provokes people to simultaneously examine the process of their communication and reflect on what experience and social reality they make in the creation of it. For example, people could make relationships and enhance the emergence of self, an organizational culture (or a subset of an organizational culture), or a creative collaboration. When people are able to look at the process of what they are making together, they can also identify those moments when an invitation to act other than was customary— a bifurcating moment—occurs and thus create something new for themselves and others.

CMM Core Principles

From the communication perspective in CMM theory, human action is purposive and consistent with three core principles:

1. Social units such as workgroups, families, organizations, persons, and nations "are deeply textured clusters of persons-in-conversation" (Pearce, 2007, p. 6). To look at communication and not through it, one examines the texture; who talks, who orchestrates the conversation, where does the conversation happen about whom and what, and how do people act towards each other in their conversational engagement? For instance, managers, administrators, and faculty can be seen as orchestrating certain conversations rather than by embodying only information or power. All kinds of matters (efficiency, productivity, morale, strategy, conflict, collaboration, etc.) can be handled by paying attention to what conversations occur, with whom, where, in what type of language, and about what topics.

2. The second principle is that communication is substantial and its properties have consequences and future implications. Through attention to the forms of communication, the turn-by-turn speech acts and episodes that have been made, people can name what they made (i.e., collaboration, conflict, understanding, etc.) and have greater choice about what gets made by their speaking and listening in the next moment. By focusing on the form of the communication with a principled disinterest in the topic and the positions about the topic, significant changes can be made in the perspectives and social worlds of the participants (Spano, 2001 as quoted in Pearce & Pearce, 2003).
3. The third principle is that social structures are constituted in patterns of reciprocated communicative action. Communicative action can be thought of as a circular process of coordinating action and making and managing meaning. Beliefs, personalities, attitudes, power relationships, social, and economic structures are made in the process of communication (Howard, 1988; W. B. Pearce, 1989, pp. 3-31).

Our communicative interactions are comprised of listening and speaking. We have the ability to reflect, create, alter, and choose how we listen and speak. As a practical theory, CMM offers core principles (above), key concepts (below) as language models, and heuristic distinction-tools that allow us to see and reflect upon what reality is made in our turn-by-turn communication acts of listening and speaking with others. In conjunction with the three key concepts of coordinated action, coherence, and mystery, the CMM heuristics are conceptual tools and models that assist actors, researchers, and practitioners in explicating the

communication perspective and intervening in social worlds. The heuristics both provoke and answer different questions in the examination of communicative action.

Key CMM Concepts

Coordination, coherence, and mystery have significance in the creative collaboration process. In this study, however, I focus on two, coordination and coherence. Coordinated action is not separate from the worlds of meaning making, nor is meaning making the only salient feature of communication. Coordinating action takes up the questions that concern the actual what is said by whom, and then what is said in a descriptive way, devoid of the topic of conversation. The coordinating action heuristics of the serpentine, conversational triplet, and episodes help either researchers or participants see the sequential timeline of speech acts, and perhaps patterns of interaction. The sequential timelines (also known in CMM theory as “serpentes”) are surrounded by stories and meaning, so by examining the sequence and stories together, one is able to see how the stories may change the action or the meaning in subsequent conversation. Patterns cannot be accessed or assessed without both an accounting of what is actually said and done, as well as what meaning is made or is in the making with each speech act and sequences of speech acts.

CMM recognizes coherence as the need of persons to make meaning and narrate their lives or happenings in stories so as to add clarity and make sense of events, thoughts, feelings, interactions, sequences, and aspects of lived experience. People do this ceaselessly, sometimes with awareness of what meaning they are making or will make by an action, but often reactively with little awareness, choice, or ability to intervene. They do this both singly and with others in conversation. Our stories are not necessarily about experiential “truth,” but

rather constitute the events and ephemera they reflect upon. As Denzin (2000) noted, “narratives are reflections on – not of – the world as it is known” (Denzin, 2000, p.xiii).

Social worlds are inherently meaningful, and there are many layers of meaning within each speech act and episode. Mindful application of CMM theory takes into account the layers of stories that contribute to the meaning with every speech act. These stories could include: configurations of oughtness that compel participants to act in certain ways; untold, untellable, unheard, or unknown stories; awareness of other similar conversations or related people; or embedded loops of meaning and action that compel “particular ways of thinking about relationships among stories” (Pearce, 2006, p. 14). The making and managing meaning heuristics⁹ aid in the discernment of what stories are in play or have been made along with the sequence of communication events. The communication events are in a sequential pattern, such as in the language action heuristics of the conversational triplet, episode and serpentine.

By using the theoretical lenses of the communication perspective—specifically, coordinated action and coherence, and the CMM heuristics that helps us see those concepts dynamically, patterns are discerned. Discerned patterns can then either be assessed as nonfacilitative to creative breakthroughs and unwanted (unwanted repetitive patterns or URP’s), or virtuous and inviting either intervention or replication. The serpentine heuristic invites us to actually see the pattern being produced, and while the first intervention could be said to be the awareness of the pattern (Marrs, 2007, 2011), in conjunction with one or several meaning making and managing heuristics, greater awareness and more choices for intentional and desired action can occur. Becoming aware of the patterns also enables a

⁹ Some of the meaning-making heuristics are the hierarchy of contexts, daisy, LUUUUTT models and concepts of logical force, communicative afterlife and charmed and strange loops. Further definitions of these heuristics are in Chapter 3, on pp. 145-149.

greater awareness of the bifurcation points, or moments when people can generate differently and choose to act wisely into the next moment, more in accordance with their creative intentions (W. B. Pearce, 2007). CMM's concept of bifurcation points is similar to a creative breakthrough in that both indicate an opening to a cognitive reappraisal and a new point of choice and action for the participants.

Creative collaboration and design involve recombinations of meaning. CMM emphasizes discourse as a process of reflexive construction and mutual coordination, and how communication practices and contextual resources influence meaning making. Pearce (1994) explained how reflexive construction occurs, "Practices and resources are co-evolutionary," he said, and resources are "stories, images, symbols, and institutions that persons use to make their world meaningful" (Pearce, 1994, pp. 23-24). Burr's (2003) description of discourse aligns with Pearce and further illuminates the process of meaning making:

A discourse refers to a set of meanings, metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of events...there may be a variety of different discourses, each with a different story to tell about the object in question. (Burr, 2003, p. 64)

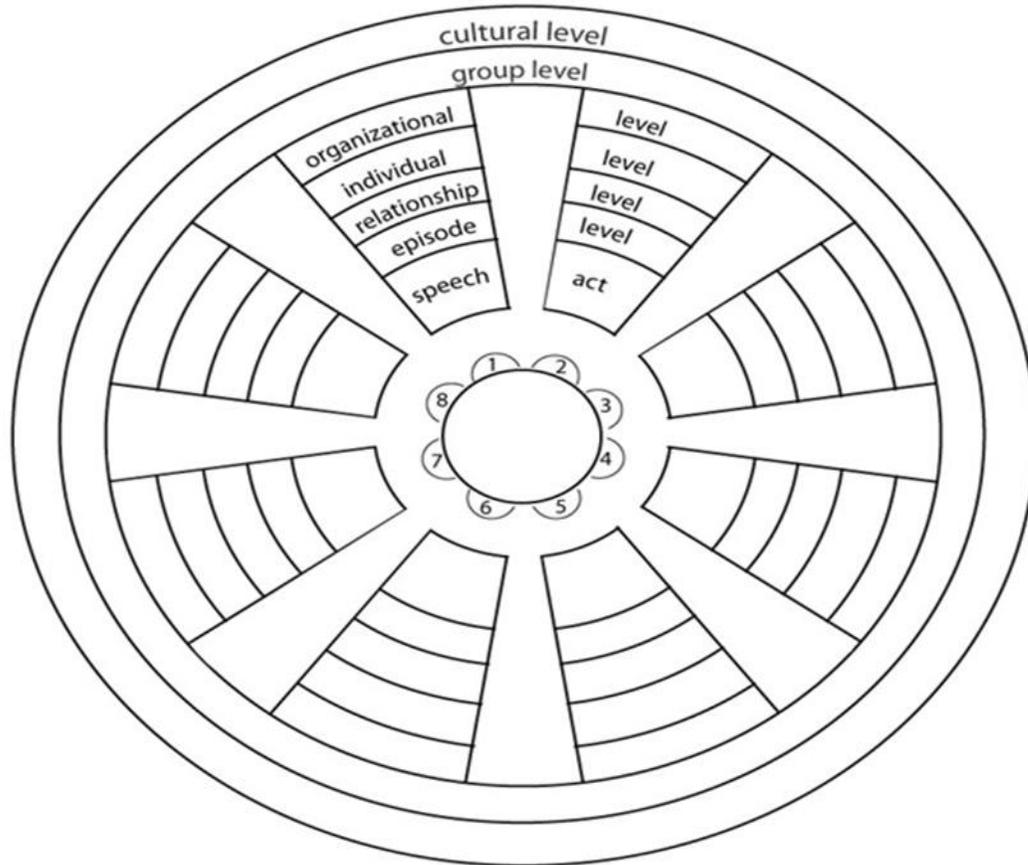
Contextual resources then could be analogous to different discourses, and the views on a particular interaction could be taken from various layers of context such as the speech act, the episode, relationship(s), individual, group, organizational, and cultural levels to illuminate sense-making.

Various scholars since the Greek rhetoricians have recognized context as essential to communication and fruitful interaction (Hayakawa & Hayakawa, 1991; W. B. Pearce, 2007; W. B. Pearce & Cronen, 1980) and as a reflexive process between language use and social

contexts (M. Bateson, 2005; Giddens, 1984; Oliver, 2005; Watzlawick, Beavin, & Jackson, 2007). Oliver (2005) called this the “constructionist principle” in that

- Communication is action.
- Context constructs communication and communication constructs context.
- Person position is an element of a story.
- Stories express a moral force. (Oliver, 2005, p. 8)

A specific conversational condition infers a pattern of social interaction and meaning making that is constructed by participants who are, in turn, affected by various and multiple contextual stories, situations, and events. Briefly stated, what people say and do is reflective of context in use. CMM offers a heuristic model, the hierarchy model of meanings that assists the researcher or the practitioner to identify the contexts in play within any interaction. Groups often communicate together to produce action or eventual action for specific results or progress. Jensen and Chilberg (1991) argued that from a microperspective, a group’s communication activity could be observed, heard, and felt with both verbal and nonverbal messages. Each message is interpreted uniquely and multiply with different levels of context by each group participant as well as the group (Jensen & Chilberg, 1991, p. 42).



*Figure 1: Possibility of contextual influence for individuals and a group in interaction. This figure builds on *A Model of the Small Group Interaction Process*, Jensen & Chilberg, 1991, Figure 2.1, reprinted from *Small Group Communication: Theory and Application*, p. 43. Belmont, CA: Copyright by Wadsworth, a division of Cengage Learning. Reprinted with permission.*

A depiction of how this might reflect the groups under study here is in Figure 1, which adds the organizational level to Jensen & Chilberg (1991): “model of the same group communication process”. Figure 1 shows an eight-person “group” in interactive dialogue at the center of the concentric circles. Each person has access to the “fan” of contexts behind

him or her, labeled with the various contexts he or she could draw upon to perceive, interpret, and act upon what is being said and done in the interaction (Jensen & Chilberg, 1991, p. 43). All members of the group can draw upon the “group” and cultural contexts of the group, indicated by the unbroken boundaries for all group members at the outer edges, but the other “fans” of context (speech act, episode, relationship, individual, and organizational layers of context) are particular to each individual.

Understood not only as a CMM practical tool of interpretation, the hierarchy of contexts model can also provide a way to understand social interaction generally. Any utterance, interpretation, episode, situation, identity, relationship, group process, historical context, or cultural pattern is a nested and nesting phenomenon. CMM theory offers that contexts are in a flexible hierarchy as one level holds or serves as context for another level of context, usually the one “below” it. The hierarchy is malleable and varies with each person or group. The hierarchy of contexts provides a way to understand the relationship between the layers of context mentioned above as well as “invite[s] us to invoke any other context that might be meaningful in a particular situation...” (Oliver, 2005, p. 9).

Brief Overview of the Creative Thinking Process

Mednick’s (1962) definition of the creative thinking process as the formation of associative elements into new combinations highlighted the usefulness and fruitfulness of remote elements brought together in new combinations. Koestler’s bisociative theory and hermeneutic treatment of creation¹⁰ as a cognitive leap whereby (at least) two unrelated thought patterns combine to make something new and startling stressed awareness—that it is in the ability to see things differently as well as recognize new information that facilitates the

¹⁰ Koestler did a comprehensive review of scientists and artists from the pre-Socratic era to the present era to argue his theory, and did not do social science or scientific research per se so his “findings” are not replicable without his commentary.

connectivity between unrelated thoughts (Koestler, 1964, 1967). Mumford and fellow researchers identified the skills necessary for creative problem solving, namely problem finding, problem construction, generation of alternatives, and idea evaluation (Mumford, Baughman, Maher, Costanza, & Supinski, 1997; Reiter-Palmon, Mumford, Boes, & Runco, 1997).

The work of Mednick, Koestler, and Mumford (and others) affirmed that creativity involves the processes of unconcealing, letting go of habitual thought or what is known, exploring unknown ideas, and connecting ideas from multiple sources. These processes often happen in recursive, reiterative, reflective activities to seek and find problems to implement novel solutions (Csikszentmihalyi, 1996). Mednick's associative theory distinguished the difference between originality and creativity by asserting that ideas that are creative have use as well as originality, even though the potential usefulness of an idea in any domain might be difficult to measure or prove. Mednick (1962) said that "the more mutually remote the elements of a new combination are, the more creative the process or solution" (p. 220). The achievement of creative solutions depends on the ideational contiguity of the necessary elements, and that achievement can happen through serendipity (e.g., the discovery of penicillin, X-ray machines), similarity (e.g., creative writing as an example of how certain elements like alliteration, rhyming, or rhythm provokes other associations), and mediation (e.g., inserting possible other variables that will increase likelihoods of contiguous associates). Anything that brings remote ideas together is facilitative of creative solutions,

and anything that keeps remote ideas from contiguous association will hinder creative solutions.¹¹

Historical Logics of Creativity Research

Until 1996, most creativity researchers emphasized personality studies of creative individuals, such as Guilford (1950), who contextualized psychology's focus on the creative personality and the process of creative thinking and the cognitive skills necessary for it (Amabile, 1996). Most sociocognitivist models for creativity are componential in nature, with Teresa Amabile's (1983) being most notable since it simultaneously addressed the inter-subjective dimensions and the intrinsic dimensions of group creativity (Glăveanu, 2011; Shalley & Zhou, 2009).

While Amabile's (1983) three-componential model¹² still focused on the individual, she widened creativity understanding to the social and environmental through her emphasis on the creative intersection of the component–domain relevant skills (background knowledge), creativity skills (a willingness to take risks and experiment, brainstorming), and task motivation. She and other scholars maintained that this framework was also applicable to groups (Amabile, 1983, 1996; Sternberg, 2005). While products and observable responses must simultaneously be adjudged novel and valuable (and appropriate or useful), in order for

¹¹ Mednick also developed one of the most used psychometric associations test that may have predictive value for creativity, the Remote Associations Test (RAT). While I am aware of the psychometric attempts to quantify creativity and predict it in individuals, I consider it beyond the scope and not wholly relevant to brainstorming.

¹²The three components are (a) domain relevant skills also include factual knowledge and expertise, and are affected by education, training, informal and formal learning situations as well as a person's perceptual, motor and cognitive capacities; (b) creativity relevant skills (now creativity-relevant processes) includes styles and strategies for using tacit and explicit knowledge for idea generation, previous experience in creative activities and some personality aspects are likely to positively influence creativity-relevant process; and last (c) task motivation which includes intrinsic and extrinsic sources and perceptions of one's own motivation towards a challenge or task. Amabile states that without intrinsic motivation, creativity cannot happen (Amabile, 1983). If extrinsic motivators do not undermine intrinsic factors, motivational synergy results (Amabile et al., 1996; Shalley & Zhou, 2009).

“creativity” to be present, the task must also demand a heuristic cognitive approach (no clear pathway towards a solution-algorithms must be invented) rather than an algorithmic one (path to solution clear and straightforward) (Amabile, 1983, p. 360). Creativity and the creative breakthrough moments in interactions could then be plotted on a continuum ranging from the creative expressions in everyday life all the way through radical innovations that have changed the way we live our lives, as the determining line between algorithmic and heuristic depends on the knowledge, goals, and tasks of the group engaged. In various group-centered research, Amabile also found that for high levels of creativity, the three-component framework was relevant to the group’s ability to make a difference in creative idea generation (Amabile, 1996; Amabile et al., 1996; Amabile & Grysiewicz, 1989; Amabile & Grysiewicz, 1987).

The intrinsic perspective has been one of Amabile’s largest contributions to creativity study. She also found that for high levels of creativity, individuals must be well matched with their chosen domains of endeavor (e.g., chess, musical composition, writing); innate talent and education are essential – one without the other seems insufficient; and diligent work and deep involvement with the work (which includes playfulness and freedom from external constraints) must be present (Amabile, 1983, pp. 361-366).

Other work that focuses on cognitive skills has a more common-sense and practical emphasis on the process such as Osborn's (1963) work on brainstorming. Osborn's work and set of simple rules for brainstorming made the creative process and the possibility for creative solutions more accessible to common situations, people and across contexts. People no longer had to possess innate talent, a creative personality, or specialized training to participate creatively.

Most psychology creativity studies have focused on (a) the creative person and not creative situations, (b) internal determinants to the exclusion of external determinants, and (c) with regard to internal determinants, more attention to genetic factors, such as intelligence, rather than learning and interaction with the social environment (Amabile, 1996). These focuses have significant impacts on how we think about creativity today. First, much of traditional psychology creativity scholarship has been on the careers and development of eminent creators, so we tend to think of creativity as special, unitary, only for the few, and inherent in “great” men who have changed domains or whole fields of intellectual or artistic pursuit, thus leaving out “everyday” situations or normal people.

Another impact is that while these studies have contributed to our increased understanding about the intellectual (cognitive) processes that are engaged during creative endeavor, their narrow focus has not increased the access or expansion of creativity as practicable. Psychology research on group creativity has primarily focused on the creative outputs of brainstorming activity. Research from the sociocultural perspective takes a multi-dimensional look at collective creativity that enriches our understanding of the combinatory process within brainstorming and access to facilitating creativity in groups. Although brainstorming is not the only method for group creativity, and the term may be conflated with other creativity practices (Smith, 1998),¹³ it is the most researched group creativity process and therefore needs to be examined in this review. Two dissimilar perspectives of brainstorming within social psychology literature illustrate the conditions necessary for group

¹³ Smith (1998) identified 172 idea generation methods and techniques from his multiple hermeneutic research of the creativity literature, (brainstorming as only one of the group techniques noted), which he “adapted from a methodology proposed by Glaser and Strauss 1967; Strauss, 1987” (Smith, 1998, p. 111) and organized into a formulary. Technique is defined broadly as “a plausibly effective prescription expressing more than common knowledge...” (Smith, 1998, p. 111) and ranges from a simple question such as “What if...” to a system of methodologies such as Synectics.

creativity: the sociocognitive and the socio-cultural. The sociocognitive perspective is more influenced by psychology research, and the socio-cultural is more influenced by sociological and organizational perspectives.

Collective Creativity in Group Process: Brainstorming

What is known about group creativity initially arose in psychology research on individuals in brainstorming processes. Brainstorming is one of the most studied and most contested group creative process methods across scholarly literature. First developed and promoted by Osborn (1963) for his advertising agency to ensure an increase in the quantity and quality of ideas, a “successful” brainstorm process is a face-to-face group process where people offer ideas for consideration as a solution to some problem and success is reliant on four rules: (a) Don’t criticize; (b) the more ideas the better; (c) combine and improve on ideas already suggested in session; and (d) share all the ideas that come to mind, no matter how wild (Osborn, 1963; Sutton & Hargadon, 1996). The core creative activities in group processes are parallel to a brainstorming group’s: to share ideas, listen to others’ ideas, and build upon them through dialogue.

Two Views: Sociocognitive and Sociocultural Research Traditions

Sociocognitive literature includes two streams of research: the cognitive studies from psychology on individual and group creativity and the team innovation studies of group creativity (Glăveanu, 2011). Sociocognitivists make the analogous assumption that the factors that facilitate individual creativity also facilitate group creativity, such as the cognitive factors of exposure to a large number of ideas as well as diverse ideas, awareness of and access to unique categories of knowledge in long-term memory, and working memory and attentiveness to creative task (Paul B. Paulus & Dzindolet, 2008; S. M. Smith, Gerken, Shah, & Vargas-Hernandez, 2006). The social is considered external to the primary locus of

creativity, that being the individual mind. This is most often the underlying sociocognitive epistemological position, which contrasts with the sociocultural position that the social is intrinsic to creativity since creativity is located “out here,” embedded within an interaction.¹⁴ Because this epistemological stance is about how the individual mind engages creatively, the research methods are designed to isolate cause and effect relationships.

The standard scientific method most accepted and used in socio-cognitive brainstorming research involves empirically controlled experiments with short-term tasks for interacting and nominal groups¹⁵ whose results are then analyzed with quantitative measures. The focus of this research method is primarily on the cognitive dimensions of the process and the levels of creativity of the outcome in a comparison between individual and group performance. Socioculturists often use qualitative methods, field studies, case studies, and longitudinal research with conversational and interaction analysis. But it is the different purposes of the research that most distinguishes socio-cognitive from sociocultural treatments of brainstorming. The sociocognitive research is designed to understand the cognitive mechanisms that would optimize “group creativity summatively” (their term for collective creativity), but sociocultural research is designed to understand, describe, and promote creative collaboration, with the emphasis on the multidimensional influences of collaboration (Glăveanu, 2011).

Socioculturists criticize sociocognitive research methodology and analysis for its often narrow or irrelevant creative task challenge that limits the range of idea retrieval and

¹⁴ Paulus and colleagues are amongst the leading socio-cognitivist researchers although Paulus has attempted to synthesize brainstorming literatures across three research traditions: temporary groups in controlled experiments, work teams in organizations, and long-term collaborative groups in real world settings (P. B. Paulus & Coskun, 2013).

¹⁵ Nominal groups are noninteracting control groups where the individuals results are summatively considered as the control “group” result.

causes a lack of ecological validity due to the controlled, artificial conditions of laboratory research. It would be desirable to conduct controlled experiments in naturalistic settings, for those types of experiments might increase ecological validity while determining cause and effect, but they are difficult to conceptualize and carry out due to the many and varied real-world factors that may impinge, and are probably slow and expensive to carry out (Paul B. Paulus, Dzindolet, & Kohn, 2012; S. M. Smith et al., 2006).

Brainstorming Research from the Sociocognitive Tradition

Stimulants and inhibitors to group creativity. As a complete review of the brainstorming research from this tradition is beyond the scope of this paper, I shall give a limited summary of the stimulating and inhibiting factors of group creative production. Sociocognitive literature on brainstorming has interpreted creative production as the fluency, originality, and flexibility of ideas (Paulus, 2009). One of the most common assumptions of face-to-face brainstorms has been that participants' sharing of ideas stimulates a synergistic condition that increases idea production. Another assumption of brainstorming is that the synergistic condition also stimulates idea exchange and recombination, since group participants are encouraged to share more unique ideas and build with one another's ideas. Yet, until recently, the examination of the idea combination process has never been explored by controlled experiments. I will end this section with a brief discussion of the recent 2011 study and contrast it with the socio-cultural studies that focus similarly, but without the same aims or methodologies.

The sociocognitivist evidence concluded that the brainstorming process in groups had been detrimental for creativity because it was less productive than other individual creative methods as fewer ideas were generated per person and fewer good ideas are generated when

a group was face to face (Diehl & Stroebe, 1987, 1991; Nijstad, Diehl, & Stroebe, 2003). The cognitive and social inhibitors outweigh the stimulants.

Scholar-practitioners who have used brainstorming methodology may validate the research that Paulus (2012) summarized as well as recognize these social causes for production loss during brainstorming as (a) concern over what others in the group might think of one's ideas (social anxiety), (b) free-riding or letting others carry the group conversation (Karau & Williams, 1993), (c) aggrandizing one's contribution compared to other participants (P.B. Paulus, Larey, & Ortega, 1995), (d) convergence of ideas over the duration of the brainstorming period in that they become less distinctive and slow down (Camacho & Paulus, 1995), and (e) downward matching comparisons with other participants (Festinger, 1954). Conversely, social comparisons can significantly stimulate creative performance: a sense of competition and accountability (Leggett Dugosh & Paulus, 2005), upward comparisons with other participants (P.B. Paulus & Dzindolet, 1993), and goals and efficacy in brainstorming (P.B. Paulus et al., 1995).

Cognitive stimulation in brainstorming that facilitates creativity includes the priming of categories to stimulate novel associations (Leggett Dugosh & Paulus, 2005). Category priming can be done well from a facilitator. In contrast, it can also be done well within the group if the group uses their heterogeneity and complementarity of sharing by deliberate attention, focusing conflicts over the ideas (and not personal conflicts), and appreciates and utilizes divergent styles and incubation time (Nemeth & Ormiston, 2007; Nemeth, Personnaz, Personnaz, & Goncalo, 2004; Putman & Paulus, 2009).

The most significant inhibitor to group creativity, however, is construed as a social one to the cognitive process, produced by a blocking of the expression of ideas caused by

waiting one's turn to speak, which then also blocks memory, idea association, and retrieval (Diehl & Stroebe, 1987; P. Paulus, 2000; P.B. Paulus & Dzindolet, 1993). "Waiting your turn" is a social developmental dilemma, not just a collective creativity one. According to Nijstad and Stroebe (2006), this effect was not due to distractions caused by overhearing others' ideas, nor due to time restrictions for speaking, but was more closely linked to participants' need to express ideas when they choose to (Diehl & Stroebe, 1991). However, Nijstad and Stroebe (2006) concluded that it is not clear why turn-taking has such a negative impact, even though access to others' ideas can stimulate creativity if participants are instructed to attend to others' ideas. But this presents a paradox for research from the socio-cognitive tradition, since attending to others' ideas has been shown to contribute to production blocking, yet the contributions from the group are needed to stimulate more categories for idea generation. To fully explore the concept of attending to other's ideas and the recombinations that could stimulate more novel and useful ideas, the sociocognitivists would need to design research that did not overemphasize the cognitive dimensions. What is needed is an approach that incorporates the social, cognitive, and motivational dimensions as well.

There is still little research in this tradition that deals with all of Osborn's instructions,¹⁶ and Litchfield contended that no study directly compares the impact of all four of Osborn's subgoals (e.g., generate as many ideas as possible, don't criticize, say what comes to mind, and build on each other's ideas (Litchfield, 2008). This is ironic, as the most compelling argument for a brainstorming process is that the diversity of knowledge sharing helps the creation of unique ideas and novel and useful combinations.

¹⁶ Sociocognitivists use the term 'goals' often to describe Osborn's instructions for brainstorming, whereas Osborn did not.

A study that varied from socio-cognitive tradition. Kohn, Paulus, and Choi (2011) performed the first sociocognitive study on the combination process in brainstorming. The purpose of their study was to find out how effectively people can generate combinations, which ideas people will use to create the combinations, and how the type of the ideas affect the combinations made. They designed two experiments that had two phases for interactive and nominal groups with over 100 undergraduate participants. In the first, people were to generate ideas either as individuals (nominal group) or in a group of three online and could then combine the brainstormed ideas as individuals (nominal group) or in groups of three face-to-face. In the second, participants considered common or novel ideas (from the researchers) and had the task of combining these into new ideas in groups of three or individually (nominal group). Before groups or individuals were asked to combine ideas, they were presented with the same list of all brainstormed ideas.

In the first experiment, participants were gathered in a laboratory room and assigned to one of the four condition¹⁷ groups, in groups of three. Each participant was given a computer, instructions on how to use AIM (a messenger tool), and the four brainstorming rules before they had to generate ideas for 10 minutes on how to improve their university. The nominal participants' responses went to the experimenter's terminal, and not to other participants. Interactive group participants exchanged ideas with each other through AIM's group chat feature, and each idea was displayed with the computer it came from so participants could see the total array of ideas generated. The instructions for the next combination phase were that participants could combine two previously generated ideas, combine an existing idea with a new idea, or come up with a new idea. These options the researchers gave the participants "emphasized the importance of participants synthesizing

¹⁷ The four conditions are: nominal-nominal; nominal-interactive; interactive-nominal; interactive-interactive.

concepts found in ideas and not simply joining the phrases found in existing ideas” (Kohn, Paulus, & Choi, 2011, p. 3).

Contrary to expectations, the researchers found that group interaction was not detrimental to making combinations. The researchers found that group interactions could aid combinations through computer and electronic means, the complexity of the task, and the mutual stimulation. Although nominal groups generated more combinations than interactive groups, interactive groups generated combinations of more utility. They also found that fewer combinations were made, but with more novelty later in the combination process, also consistent with other research that novelty increases over time when engaged in the group process. This result is similar to other research demonstrating that when people can individually brainstorm and then gather as a group for idea selection, better ideas are selected as a group than before group brainstorming (Putman & Paulus, 2009).

Experiment 2 was designed to investigate combinations that could occur from already generated ideas from another source (they were given a list of unique and common ideas), as this often occurs in real-world conditions. The experiment was designed and conducted similarly to Experiment 1 in phases and the four conditions, but differs from Experiment 1 in that participants did not choose between their own ideas and others’ ideas for combinations. Rather, they tested the variation in the type of ideas (common vs. unique) using a modified, “paper and pass” modified brainstorming procedure called brainwriting for interactive combination from a list of 40 ideas. Participants were asked to write down new combinations made with a notation of the sources for the new ideas. Other research has shown that common ideas may activate more associations since they are closely associated with the semantic networks of participants (Leggett Dugosh & Paulus, 2005). Hence, common ideas

should lead to more combinations. Common ideas should also lead to more feasible ideas and impactful combinations from the interacting groups. The researchers reasoned that unique ideas should lead to the exploration of categories and ideas that would not have been thought of without priming, resulting in more novel combinations, especially in groups.

Experiment 2's findings showed that the modified brain-writing procedure reduced the number of combinations (as expected); however, it helped participants consider how ideas were connected, affecting the kinds of combinations made. As expected, the interactive groups generated more novel combinations with rare ideas and combinations of more impact with common ideas. The most surprising result was that rare ideas also led to more feasible combinations from the interacting groups, as novelty and feasibility were strongly correlated from these combinations in this study, which isn't always the case in real-world settings.

Kohn et al.'s (2011) study is important to sociocognitive research in several ways that depart from a purely cognitive orientation. As the first study to investigate the idea combination process in this research tradition, the results from Experiments 1 and 2 are interpreted positively for interacting groups.¹⁸ Interactive groups can generate more useful ideas and combinations, and they can come up with more novel and feasible combinations with rare ideas. Additionally, this is one of the few studies in this research tradition that has found positive benefits to the social dimension of interactive groups in brainstorming. Unsurprisingly, the number of ideas and combinations from interactive groups confirm prior literature that individual generation is more productive in the quantity of ideas and combinations. Yet, Kohn et al.'s (2011) research design showed more nuance than most of the prior socio-cognitivists since it included the initial generation of ideas, the attending to

¹⁸ This contrasts significantly with the bulk of sociocognitivist research from the mid-1990s onward as mentioned herein on page 10.

ideas, and the combination of ideas. These aspects of the research design more closely mimics real-world brainstorming conditions and shows the limitation of looking at brainstorming in a one-dimensional way (quantity of ideas only).

Brainstorming Research from the Sociocultural Tradition

Sutton and Hargadon's (1996) ethnographic, in vivo study on the use of brainstorming in a product development firm (IDEO) for 18 months was a seminal study in the innovation and design literatures, and one that deeply refuted findings from sociocognitive literature previously conducted. Sutton and Hargadon (1996) questioned whether idea generation should be the primary effectiveness criterion for brainstorming face-to-face in groups, especially in groups who create together routinely and have a future in doing so. These researchers organized their study around the question, "How does IDEO innovate routinely?" and gathered evidence from observed brainstorming in the first stages of the creative process (a subset of the innovation process), as well as other various instruments, and analyzed the results as themes from hunches they gathered in the data and from the literature.

IDEO altered Osborn's guidelines.¹⁹ Though the topics could range from broad to narrow design problems, the brainstorming would be conducted in a frequent, playful manner. Two to four brainstorming sessions would occur in the first few weeks of a project to help generate possibilities and possible design concepts. The rooms would be stocked with refreshments, with rules displayed and similar products dispersed around to "play with" to spark further ideas as the conversation progressed. Building on the ideas of others was emphasized and criticism discouraged, rather than the Osborn injunction of "the more ideas the better."

¹⁹ The IDEO brainstorming rules are (a) defer judgment, (b) build on the ideas of others, (c) one conversation at a time, (d) stay focused on the topic, and (e) encourage wild ideas (Sutton & Hargadon, 1996, p. 693).

The findings showed that routine uses of brainstorm²⁰ at IDEO were effective for the individual participants, the group creativity process of problem assessment, idea generation, and concept refinement. Instead of just one brainstorm to generate ideas, brainstorm^s would be called and used whenever more ideas or a refinement of an idea was needed. Designers learned a wide array of technical knowledge and could also show off their technical skills to each other (and sometimes to clients) by how they could recall old ideas, reframe them, blend and refine ideas with others' ideas, sketch new designs, and share crude prototypes. In short, brainstorm^s enabled the designers to create a strong network of professional support, a virtuous spiral of knowledge sharing, and a network of conversation for competency development and camaraderie (Krippendorff, 2008).

Sociocognitivist literature maintained that turn-taking and the need to attend to too many ideas at once by group members during group interaction contributed to production blocking, one of the main cognitive inhibitors. Contrary to sociocognitivist literature, findings from the Sutton and Hargadon (1996) study pointed to new group interactive conditions that facilitated reliable, leading-edge innovation performance. At IDEO, the turn-taking methods in their brainstorm practice and norms reflexively engendered more of the behaviors that constituted the practice and supported the emergence of an attitude and pattern of wisdom (Giddens, 1984), rather than a pattern of frustration from waiting one's turn and an inability to attend to too many ideas at once. Sutton and Hargadon (1996) characterized wisdom as "acting with knowledge while doubting what one knows" (Sutton & Hargadon, 1996, p. 702). This ability shows more cognitive flexibility and may indicate that the cognitive dissonance enhanced creativity. The designers thought their opportunities to brainstorm were their chances to cause their own ideas to change, or to undergo cognitive

²⁰ At IDEO, the brainstorming processes are termed "*brainstorms*."

reappraisals by their willingness to question their own knowledge and be simultaneously open to another's interpretations.

Most of the group creativity literature has focused on the conditions that facilitate the fluidity of idea generation (quantity of ideas): exposure to a great number of diverse ideas, awareness of and access to categories of knowledge for memory retrieval, and intrinsic involvement with the creative task. These two studies have shown that brainstorming with modification or a larger contextual focus can help the richness of creative production. Attending to others' ideas and combining ideas with a group, namely as a group interactive process, enhances how ideas can be combined with computer-aided modalities (without production blocking). Group interactive process also has been shown to improve cognitive flexibility as cognitive reappraisals are pursued for problem assessment, idea generation, and concept refinements.

Sociocultural Literature: Creative Collaboration

[C]reativity is never an individual phenomenon as it always involves social interaction be it for stimulation, collaboration, or evaluation. (Glunk, 2004)

Although the sociocognitive tradition of creativity research primarily focuses on the outward manifestations of an internal cognitive process and mainly draws from the psychology and social psychology disciplines, the sociocultural tradition investigates the social and environmental influences for creativity and significant innovation. The more socio-cultural perspective includes and crosses several disciplines such as sociology, social psychology, organization innovation, communication/linguistics, education, management and business, economic theory, design disciplines, and traditions of research.

The literature reviewed in this section will come from several of those disciplines, but is not comprehensive or exhaustive. According to Anderson and West's (1998)

organizational and technological innovation literature, there were between 2,400 and 4,000 publications respectively on the topic. Anderson and West cited West and Farr's (1989) definition of innovation as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society" (p. 239). Not only is the breadth of interested disciplines represented in the socio-cultural literatures, but a span of contexts is also covered with a unit of analysis from a macro context (cultural, broadly social, or organizational) to meso contexts (the group or groups) and finally to micro contexts (the interaction within a group or between a dyad as well as the interaction itself). Finally, the sociocultural literature includes treatments of the inter and intrasubjective processes of the social, motivational, emotional, and cognitive dimensions in creative collaboration.

My review of the sociocultural literature focuses on four sub-themes: (1) key distinctions of creative collaboration, (2) dialogic interaction, (3) improvisation as the conversant patterns for creative emergence, and (4) speculative talk as the kind of listening and talk that nurture and sustain both collaborative and creativity in group process.

Key Distinctions of Creative Collaboration

Both creativity and collaboration imply a crossing of borders. Creativity infers a going beyond what is known, and collaboration requires permeable boundaries for the mutual exchange of energy, purpose, interpretation, and perspectives between the people engaged in it (Moran & John-Steiner, 2004, p.12). Creative collaboration scholarship focuses on the conditions and factors that stimulate and help a group engage and participate fully in the kind of back-and-forth dynamic of sharing, challenging, and reshaping of ideas or outputs,

demonstrating that the interdependence was necessary for a transcendent collective result as well as transformation of identity in the process (F. J. Barrett, 1998; Benedict-Nelson, 2012; Littleton & Miell, 2004; Sawyer, 2004b). Creative collaboration scholarship does not view the creative process as mainly a cognitive one, nor its success measured in the quantity of ideas. Instead, they see the collaborative dimensions of creative work as central, and those dimensions include the socioemotional, interpersonal, and cultural aspects that facilitate creative collaboration.

The researchers from this tradition recognized that creating collaboratively is often an emotionally charged process that has inter-subjective dimensions, as people construct meaning and relationships as they generate ideas and make products or services (Littleton & Miell, 2004). Collaboration is distinguished from social interaction (two people in communicative exchange), from cooperation (working together with shared purpose), and working together (coordination of actions) by an “intricate blending of skills temperaments, effort and sometimes personalities to realize a shared vision of something new and useful” (Moran & John-Steiner, 2004, p. 11).

In her review of 80 studies on collaboration from a communication perspective, Lewis (2006) distinguished collaboration’s five characteristics:

- Features action and doing rather than having or being;
- Collaboration cannot happen until a specific kind of relationship exists amongst members;
- Equalization of power and status;
- The temporal dimensions of beginning, middle, and end are present; and
- The process is emergent, informal, and volitional amongst the participants.

Although not a mirror image of these characteristics, the creative collaboration literature emphasizes four essential group interactive conditions, which not only echo Lewis's (2006) conclusions, but are also essential to the creation and sustenance of collaborative group processes that facilitate high levels of creativity: dialogic interaction, complementarity of sharing, the presence of tensions, and trust in the emergence of creative outcomes.

Dialogic interaction means that it is essentially mutual, relational, and egalitarian, and honors the social dimension as intrinsic to creativity (Glăveanu, 2011; Moran & John-Steiner, 2004; Sawyer, 2006b, 2006c; R. K. Sawyer, 2007). Members in a creative collaboration are focused on mutual learning and understanding each other's work--but not confined to only dialogic interaction (V. John-Steiner, Weber, & Minnis, 1998).

Complementarity of sharing includes the willingness to act interdependently and to honor and share difference: concepts, expertise, perspectives, working styles, temperaments, resources, needs, and talents as well as the willingness to accept those aspects from others, challenging the self and others and being changed in the process (F. J. Barrett, 1998; V. John-Steiner et al., 1998; Moran & John-Steiner, 2004). Complementarity also involves a sharing of vision, and a grace about the co-evolving developmental processes that are simultaneously and individually engaged in partnerships and creative collaborative work. Complementarity of sharing requires divergent and convergent thought, and is not segregated neatly into a "creative" or an "implementation" phase, but rather throughout the whole of the innovative process (Dahl & Moreau, 2002; van der Heijden, 2011).

Tensions are necessary for fruitful creative collaboration, while politeness and consensus are its death knell. Tensions may include the intersubjective experiences of

vulnerability and security, jumping in and holding back, and personal differences leveraged and taken advantage of for bringing out opportunities to the matter under concern (Moran & John-Steiner, 2004 p. 12). This is especially evident when the task is complex and open-ended and requires inventiveness (Grossen, 2008).

Emergent outcomes that could not be predicted nor summed at the outset of a group project are indicative of successful collaborations (Sawyer, 2003a). Interdependence grows amongst the participants across the stages of the creative process. Over the lifespan of the collaborative relationship, altering relationships amongst group members can be observed in the creative process stages—in the preparation or problem finding stage, in the insight and incubation stages (which indicate problem-solving activity), and in the elaboration stage (which includes refinements made to the idea or design through implementation). This means that both the collaborative relationship and the outcome can qualitatively shift over time.

Collaboration is a highly social process. Cognition is a highly subjective process. Both processes affect each other, yet how they do is a question still being explored. The research methods used to assess creative collaboration are usually qualitative²¹ without facilitative creative formulas as outputs. Communication, languaging, and the construction of new meaning are central to the joint construction of subjectivities, social worlds, and outcomes. Therefore, this section will emphasize communication and conversational conditions that most impact collaboratively creating breakthroughs in a creative process.

²¹ Qualitative studies usually include experimental/observational studies as well as case studies, as Moran and John-Steiner (2004) pointed out. The experimental studies have utilized short-session groupings to solve a problem, improvise or generate ideas and have used children or adults (Amabile, 1996; Montuori & Purser, 1999). Case studies of long term collaborators have helped reveal the background cognitive processes that were engaged in the collaboration, but are also limited by selective retrospective reflection (F. J. Barrett, 1998; Vera John-Steiner, 2000).

Discourse and Dialogic Interaction

Various creative collaboration scholars have proposed that the dialogical perspective and interactive discourse are what enable people to formulate new knowledge, new ideas, and new solutions, with the most creative situations as those embodying both complementarities from the participants' conversations as well as the mutual utilization of another's view (Etelapelto & Lahti, 2008; Vera John-Steiner, 2000; Sawyer & DeZutter, 2009; Seddon, 2004). It is dialogic in that whatever is said has at least two levels of meaning in the utterance –the speaker's own meaning and the memory of the utterance's usage and meaning from the past (Bakhtin, 1986; Sawyer, 2006c). John-Steiner (2000) characterized creative collaboration as a form of dialogic thinking, defining it as “thinking that is fashioned, refined, and elaborated in the course of intense exchanges,” for which Niels Bohr's geometric, verbal, and visual theory constructions with junior and contemporary scientists served as an example, as it was constant and always an invitation for contradiction to make it better (Vera John-Steiner, 2000, p.45). Wegerif (2005) proposed that the dialogic approach is a teaching method for creativity skills because he maintained that the centrality of creativity is to reason and the ability of learning to learn more generally, and in online environments specifically (Wegerif, 2005, 2007). Wegerif (2005) argued that dialogical models of reason have two necessary features, “an account of fundamental inter-subjective orientations and an account of social ground rules followed in an interaction” (Wegerif, 2005, p. 6).

Amhag and Jakobsson (2009) took a sociocultural perspective to collaborative learning. They said that the development of knowledge and learning was based on an interdependent, socially interactive, and collective process where those that listen are as

important as those that speak for the collaborative creation of meaning (Amhag & Jakobsson, 2009, p. 661). This makes learning and knowledge creation a collective process, impossible to study through the sole lens of the individual. Therefore, the most observable way to analyze this process is through the study of the interactive conversations where the interdependency can be tracked and understood. As Amhag and Jakobson (2009) noted, “language is the link to the outer dialogue through communication with others and...develops into an inner dialogue or thought process that can change our understanding of the world” or objects (Amhag & Jakobson, 2009, p. 5). Since Post et al. (2009) found that teams who reported more collaborative learning also engaged in more collaborative behavior and produced more radical innovation (Post, De Lia, DiTomaso, Tirpak, & Borwankar, 2009, p.17), research on the interactive processes involved with collaborative learning shed light on the conversational conditions that are conducive to creativity and creative breakthroughs.

Improvisation: Conversant Patterns for Creative Emergence

Jazz improvisation. One of the critical distinctions for creative breakthrough is the generation of a set-breaking heuristic. But one of the central paradoxes in the in vivo research of creative breakthroughs is that breakthroughs are unpredictable. Improvisational research, whether in the domains of education, music, theatre, or organization theory, provides insights into what conversational conditions may facilitate setbreaking, as “[i]mprovisation involves exploring, continual experimenting, tinkering with possibilities without knowing where one’s queries will lead or how action will unfold” (F. J. Barrett, 1998, p.606).

Jazz improvisation and improv comedy performance offer opportunities to study setbreaking, because it occurs more frequently in those creative venues. In Weick’s (1998) orienting essay about organizational improvisation in the *Organization Science* issue devoted

to it (Vol.9, Issue 5), he noted that jazz improvisation was used as the central analogy and model for organizing at the beginning of this millennium in an ever complex, uncertain, and interconnected world. Weick cited Berliner's definition: "Improvisation involves reworking precomposed material and designs in relation to unanticipated ideas conceived shaped, and transformed under the special conditions of performance, thereby adding unique features to every creation (Berliner, 1994, p. 241)."

Although *breakthrough* means new, it rarely means something made completely out of nothing. More frequently, a radical innovation has components of ideas or experiments previously tried in another context, time frame, or with different elements either used in the process or composition of the product (Amabile, 2001; Hargadon & Douglas, 2001; Vera John-Steiner, 2000; Robinson, 2010). Setbreaking also may imply a lack of constraints, but indeed, some researchers have found that constraints may inspire novelty (Stokes, 2009). Successful improvisation relies on players' competency, collaboration, risktaking, and ability to take what emerges and build upon it for something new.

Like Amabile (1983), who postulated a creative performance range continuum from the reliance on the familiar and ordinary algorithms on one dimension to set-breaking heuristics on another dimension, Weick (1998) devised a range of improvisation. He creatively combined Konitz's ²² range of improvisational distinctions of "interpretation," "embellishment," "variation," and "improvisation" with Miner et al.'s (1996) descriptions of organizational improvisation in new product development, and the verbs used to note the degrees of improvisation that fit Konitz's range, as I have arranged in Table 1 below.

²² Weick cites Lee Konitz in Berliner 1994, pp.66-71 and Weick uses Konitz's distinctions (Weick, 1998, p. 544).

Table 1

Range of Improvisation (Based on Weick, 1998)

| <u>Kinds of Improvised Performance (Lee Konitz in Berliner, 1994, pp.66-71)</u> | | | |
|---|--|---|--|
| <u>Interpretation</u> | <u>Embellishment</u> | <u>Variation</u> | <u>Improvisation</u> |
| <ul style="list-style-type: none"> • Paraphrase • Perform basically what is written • Minor liberties taken with the melody or novel accents or dynamics | <ul style="list-style-type: none"> • Ornament • Modify • Greater use of imagination with whole phrases in the original work, rephrasing beyond the original | <ul style="list-style-type: none"> • Insertions of note clusters not in original melody that bear little resemblance to the original; • Using alternative models as a basis for inventing new phrases | <ul style="list-style-type: none"> • Radically alter portions of melody or wholly replace segments with new creations |
| <u>Verb Indicators of Degree of Improvisation (Miner et al. 1996, pp.9-14)</u> | | | |
| Shift | Switch | Alter | Create |
| | Add | Revise | Discover |

Weick's (1998) conceptualization could guide the interpretation and analysis of the creative, collaborative conversations of a workgroup for breakthrough moments in the conversational turns group members make while enacting improvisational performance. Noticing the verbs in use while a collaborative workgroup is in the process of creating gives insight as to the specific conversational conditions that could be present for breakthrough moments, as the verbs indicate degrees of adaptation or transformation of an idea.

Sawyer (2006) stated that the dialogues of improvisational performance, whether musical or theatrical, demonstrate the three essential characteristics of group creativity: (a)

improvisation, in that creativity happens in the encounter itself and is not representational; (b) collaboration, in that all members contribute in the interactional dynamic, without one or two leading or dominating; and (c) the performance or product is emergent, in that the whole is greater than the sum of the individual parts and is unpredictable, contingent, and difficult to attribute to any of the diverse components (Sawyer, 2006c, p. 148). The dialogues of improvisation are of combinational unpredictability in that there are many openings for various responses, in timing and pacing, from any one action.

By shifting the frame of creative investigation from brainstorming practice to improvisation, we can see that group creativity may be more like improvisation than the spigot approach to “turning on” or “turning off” creative moves, as seen in brainstorming. In improvisation, the creation of the phrase, the frame, or the story is contingent moment to moment, as it is in any group with a creative task. In jazz, the variety and creativity of responses are dependent on the musicians knowing the “language” well, as Weick (1998), Barrett (1998), Seddon (2005), and Sawyer (1999, 2000, 2003) maintained.

Seddon (2005) found six modes of communication in jazz performance arranged from two main categories (verbal and nonverbal). Seddon identified each category containing three modes of communication: instruction, cooperation, and collaboration (Seddon, 2005, pp.52-53). The most creative and collaborative were noted as nonverbal empathetic attunement (collaboration), where musicians are playing and taking creative risks. To be able to be spontaneous and creative appropriately in the moment requires levels of competence and preparation.

Improvised dialogue in comedy groups requires that the actors are familiar with conventions and practices of spontaneous storytelling, relational attunement, and character

building. Novel and appropriate responses in jazz and improv comedy demand that the performers are capable of performing material (song, phrases, notes, bits, licks, comps, or minimal structures of a song, skit, or situation) with each other in one moment while holding possibility for the emergence of something new in the present moment, and in a give-and-take series of actions with one another as the song or skit unfolds. As either the musical dialogue (in jazz) or the actors' dialogue emerges, sense of "what just happened" is made retrospectively and is observable in the following action(s). As the players do not have predetermined outcomes and must create them, they bring a faith in their ability to find the linkages amongst each other from "what just happened" with the emergence of something worthwhile (F. J. Barrett, 1998; Sawyer, 1999; Weick, 1998b).

Improvisation requires dialogical acuity in terms of owning the background discipline (the past) as well as an ability to create with others for the future in the present moment. Yet, competency can also become a trap as musicians and actors may fall into habits, routines, and safe formulas doing what worked before. To avoid those comfortable urges, deliberate efforts are made by the very best performers to disrupt the known, move into the unknown, and make incremental re-orientations as they listen and then try out recombined material (Barrett, 1998, p. 609). Barrett called these efforts a development of provocative competence, or a practice of interrupting habit patterns, in his 1998 review of how jazz improvisation could exemplify how an organization could maximize learning and innovation and serve as a model for management (Barrett, 1998).

Barrett discussed seven characteristics²³ that must be present for successful jazz performance. The aim of all jazz performance is to accomplish "a groove", where the flow of

²³ The seven characteristics for successful jazz performance are (a) provocative competence-interrupting habit patterns, (b) embracing errors as a source of learning, (c) co-ordinating action with minimal structures so as to

the jazz conversation amongst the musicians has departed from the standards and each musician is playing improvisationally. Striking “a groove” could be likened to a collection of breakthrough moments, but if strived for too much, proves elusive. His discussion of each of the seven characteristics lend themselves to an analysis of the features of the listening and speaking that are present in the give and take for successful jazz performance. While I will not discuss all seven characteristics from this perspective here, two characteristics seem central to creative breakthroughs and suggest an emergence of a replicable conversational pattern: how jazz improvisers appreciatively listen and try-out moves with the errors that are inevitably made during performance, and how they take turns soloing and supporting.

Because jazz is a highly expressive and risky endeavor, errors are inevitable. Unlike more general organizational performance where people seek to avoid mistakes or cover them up, or in collaborative workgroup performance in healthcare or other high reliability organizations where errors must be minimized, jazz performers are predisposed to accept and incorporate errors into their performance as part of the overall context that honest jazz is public exploration (Barrett, 1998, p. 610). Not only do they accept and incorporate mistakes, but Barrett implied that the very best of jazz musicians (Jarrett, Davis, Hancock, Friedman, Little) listen for errors as their opportunities to explore, discover, and re-define the song’s context, and create a new pattern of music. They do this in various ways, but the essential element is they play with and highlight the error. The value is intrinsic to the situation, set, players, song, time, and audience.

As sources of tension, errors become “seeds for activating and arousing imagination...as a prompt...[to be] played with the notes, embellishing them, using them as

maintain minimal consensus and disclosure, (d) distributed task-negotiation toward dynamic synchronization, (e) reliance on retrospective sense making as form,(f) hanging out in communities of practice, and (g) alternating between soloing and supporting (Barrett, 1998, p. 606).

a creative departure for a different melody....[or a chance] to shape [a] solo...” (Barrett, 1998, p. 610). Errors, mistakes, and breakdowns are seen and adjusted so the playing can continue in an “aesthetic of imperfection,²⁴” in recognition that the whole expansive performance produced both the beautiful and courageous moments as well as the breakdowns. The conversational pattern that could be seen here with errors and mistakes are then the ways in which the musicians respond to a mistake—what gets embellished, and in what ways? What is reframed and redirected as what is “said” next, not only from speech acts in the subsequent turns, but also in what meaning is being re-made from an appraisal of the whole episode or segment? The conversational patterns of collaborative workgroups could then be discerned and mapped from the actions, meanings, and creative departures taken from mistakes or breakdowns.

Barrett (1998) featured a unique aspect of jazz performance that could also illustrate a conversational pattern for creative collaboration and creative breakthroughs, namely the practices of musicians’ alternations between soloing and supporting each other during a song. Solos are intended to feature a particular player’s improvisation during a song. Barrett said that jazz musicians alternate leading a performance by taking turns soloing and then featuring another performer’s solo with the provision of rhythm and harmony for the background. This accompaniment (called “comping” in jazz language) is not passive; it is an active condition for the creative turn in the ways in which the background players can set up the soloist as well as sustain and embellish an improvisation afterwards. The soloist needs the accompaniment, just as collaborative workgroups of diverse members need the supportive participation of each member to arrive at a novel and valuable design, proposal, product,

²⁴ Barrett cited Weick’s discussion of critic Ted Gioia’s call for a different standard of evaluation for performance, ‘aesthetic of imperfection’ (Weick, K. 1990. *Managing as improvisation: Lessons from the world of jazz*. Aubrey Fisher Memorial Lecture, University of Utah, October 18) (Barrett, 1998, p. 611).

procedure, or outcome. The positive orientation towards errors and affirmative, attentive, appreciative, and creative listening is central to this turn-taking and to creating a collaborative condition of mutuality and participation.

Jazz accompaniment could function as a metaphor for creative listening, as Barrett outlined three steps that are present in it:

1. Each player surrenders his or her own virtuosity to enable another player to solo and improvise;
 2. To help the soloist to excel and organize the course of the solo, each collaborator attentively listens to what the soloist is doing in order to interpret the playing, help all anticipate the future direction, and make quick decisions for the convergent rhythmic and harmonic progression of the song; and
 3. Each player appreciates the soloist's vision, and is sensitive to how he or she might see beyond the current expression of the soloist's vision to extend and expand it with a provocative chord or accent that helps the soloist move in another direction
- (Barrett, 1998, p. 617). Although in accompaniment, the players are actively creating along with the soloist, Barrett argued that such listening enables excellent soloist performance, and the suggested metaphorical pattern of accompaniment could aid the analysis of the conversations to better feature the emergence of a creative breakthrough.

Comedic improvisation and the interactional mechanisms in group distributed creativity. Distributed creativity applies to collaborative groups who are in task situations where they must generate a shared creative product in conditions that range from predictable and constrained to unpredictable and unconstrained, which can happen in single or multiple

encounters (Sawyer & DeZutter, 2009, p. 82). Sawyer and DeZutter's (2009) study was more focused on the unpredictable and unconstrained creative process.

Although Sawyer was not focused on creative breakthroughs, the essential frame of his work on collaborative creativity has three foundational assertions that could give insight into the conversational conditions for breakthrough generation:

1. The first unit of analysis for group creativity is the collective social phenomena of the group;
2. the most central feature of group creativity is communicative and symbolic interaction; and
3. the improvisational nature of the collaborative creative process results in collaborative emergence, or unexpected creativity (Sawyer, 2003a, 2003b, 2003c, 2004c, 2006b; R. K. Sawyer, 2007; Sawyer & DeZutter, 2009; St. John, 2007). This concept of collaborative emergence in the context of distributed creativity amongst a group is similar to the collection of breakthrough moments for a novel and appropriate design, idea, or product that could be termed a breakthrough.

Sawyer et al. (2009) argued that collaborative emergence is unlikely in routine or ritualized situations, such as business meetings controlled by a single manager. As a group proceeds to interactively align itself with the following four emergence characteristics, collaborative emergence is more enabled:

1. The production of an unpredictable outcome that is not known at the outset;
2. the way of arriving at the outcome is by moment-to-moment contingency as any one action is dependent on the one before and the next moment is also unknown;

3. any one action or effect can be changed by the subsequent actions of others in the group; and
4. the process is collaborative, and participants can contribute equally (Sawyer, 2009, p. 82).

Sawyer and DeZutter (2009) asserted that interactional analysis was the most suitable research method for the study of distributed creativity (e.g., a focus on the observable actions of people with each other and objects, including talk, nonverbal gestures, and movements, and how people use objects) to ascertain the dimensions of collaborative emergence. The purpose of interactional analysis in their study was to understand more deeply how creative products emerge from collaboration and to empirically ground the behavioral patterns that result in collaborative emergence (Sawyer & DeZutter, 2009, p. 90).

Over the course of 6 months, Sawyer et al. (2009) conducted an interactional analysis of a teen nonprofit theater troupe's 12 rehearsals and five performances of an intensely improvisational show. The show, *Squids Will Be Squids*, was adapted from a book with the same name.²⁵ The show consisted of several 5-min scenes, each based from a single page in the book and each with a bizarre twist or parody of an Aesop fable. The director chose not to script the scenes; instead, he had the actors collaborate and improvise to develop the scenes in the rehearsals within a larger plot structure. The scenes were never fixed, improvisation was encouraged in every performance (no two performances ever matched), and the actors rotated parts with each performance.

Although initially guided by the book version of the one page stories, the researchers found that the participants' collaborations resulted in a collectively created overall narrative

²⁵ Scieszka and Smith's (1998) *Squids Will Be Squids: Fresh morals, beastly fables*. Penguin Putnam, New York.

that emerged from two types of dramatic structure that the adolescent participants enacted: (a) three elements of narrative –character, relationship, and plot were developed from the improvisations, and (b) “bits,” or short segments of dialogue and action, emerged and were kept of subsequent performances (Sawyer & DeZutter, 2009, p.86). The “Rock, Paper, Scissors” was suggested as a storyline, with original characters, relationship development between characters and bits, and conflict in different plot events. New ideas about the characters (e.g., a teacher obsessed with rocks) would get layered in a two-phase way during rehearsals. For instance, the teacher being obsessed with rocks idea would emerge at first, and then later, another actor would elaborate on that idea. Sawyer and DeKutter (2009) implied that multi layered interpretation is characteristic of collaborative emergence, for although development occurs from the linear time sequence, it also emerges from a newly unfolding improvisation with different actors within the scene (Sawyer & DeZutter, 2009, p. 87). From the transcription of scene examples the researchers gave and the brief story from the book on “Rock, Paper, Scissors,” these went significantly beyond the book’s theater adaptation as well as the book. In addition to these embellishments, the actors also developed short interactional routines that highlighted plot points and are called “bits.” These creations combined to form a collective narrative arch that was at once relatively stable, but kept emerging over the five performances, as “the scenes in Squid changed every time they were performed” (Sawyer & DeZutter, 2009, p. 90).

Sawyer and DeKutter’s (2009) findings showed that interactional analysis and collaboration both contributed to a deeper understanding of distributed creativity in collaborative workgroups, and that this is observable and empirically based in language and interaction. If creative breakthroughs were to emerge from collaborative workgroups then

they would emerge in what is said and done. Seddon (2005) provided a rubric of the most creatively collaborative communication, while Barrett (1998) stressed the give and take within jazz performance, and Weick (1998) aided the analysis of set-breaking heuristic with a range of improvisation model with verb usage. These scholars established that it is the conversational interactions that constitute creativity and the sustaining conditions of collaborative group process. What could be better understood are the sequential patterns of the kinds of talk that contribute to the occurrence of breakthrough moments in improvisational situations.

Speculative Talk and Listening

Although the specific kinds of talk for creative breakthroughs within collaborative groups have not been studied per se, the kinds of talk that scholars have noted as being more facilitative for group creative performance are highly indexical and context sensitive, namely indirect speech, metaphor, and analogy, and equivocal utterances or episodes. More important, these kinds of talk are highly dependent on the kind of listening that is provided within group interaction. This helps define the levels of creativity achieved, and creative listening and empathetic attunement will be discussed further as enabling companions to facilitative speech. I categorize these forms of speaking and listening as speculative talk, for its performance invites participation in the sharing of ideas, attending to levels of meaning and the recombination of perspectives and ideas for something new. These forms of talk will be explored below.

Metaphor and Analogy

Metaphors and analogies are a form of indirect speaking that provoke new and more connections both for creative production as well as for the growth and development of a

creative collaborative workgroup (Srivastva & Barrett, 1988). As the process of creation is highly associative, context dependent, and dynamic, the use of metaphors and analogies reveal group members' access to different categories of tacit knowledge as well as enrich the creative interaction as they can contain ambiguity, paradox, and multivocal meaning.

Generative metaphor, a term coined by Donald Schon, is a kind of frame restructuring, or an immersion in the process of resetting, re-naming, or regrouping a problem and adding new features to the problem or opportunity. Metaphors can make new frames that enable people to perceive and interpret in new ways, provide a safe way for a group to align around an idea or interpretation, and deal with difficult or complex topics indirectly. Srivastva and Barrett (1988) found that a group's use of generative metaphor was indicative of its growth overtime, from highly individualized and adversarial to helpful

Other scholars have noted how the use of metaphors and analogies have facilitated idea generation and improvisation and reframed problems so solutions were more available (F. J. Barrett, 1998; Dahl & Moreau, 2002; Dunbar, 2001a; Gassmann & Zeschky, 2008; Gentner, Bowdle, Wolff, & Boronat, 2001; Green, Cohen, Kim, & Gray, 2012; Sawyer, 2006b; Weick, 1998b). Likewise, product designers in idea generation have borrowed the jazz metaphor to talk about the fast, reciprocal building of ideas that can happen in groups. I overheard product designers say to each other after a work session, "I love it when we riff an idea and it then turns into something else." By looking at how a group uses language, especially the indirect language of analogy and metaphor, we can trace how a group bestows meaning and makes creative turns.

Scholars have noted how metaphors and analogies, and even language itself, conceals as well as constructs perception, selection, expression, and experience (F.J. Barrett &

Cooperrider, 1990; Lakoff & Johnson, 1980; Morgan, 2006). Language dissects and limits experience by giving an a priori lens of meaning and pre-coding of experience, as well as opens experience by provoking new associations and understanding through comparisons. Dunbar (2001a) saw analogy as a key component of human mental life and inimical to creativity. His work has focused on leading scientists' use of analogical thinking in conducting their research. He contended that scientists' cognition, specifically through analogy use in in vivo settings, provides an ideal situation through which to better understand creative cognition more generally because

1. a scientists' work is creative by adding new knowledge;
2. like jazz and improv theater, there is a depth of knowledge from particular domains that scientists may access;
3. scientists usually work in groups in contemporary science with varying levels of expertise and different backgrounds represented; and d) that relatively little is known about how groups think and reason (Dunbar, 1997, p. 2).

The basic composition of an analogy is the target or focus that a reasoner is trying to understand (e.g., problem, challenge, issue) and the source or base that is the familiar aspect of information (or construct) used in the understanding attempt. For instance, *internet* could be the target and *highways* the source material. Similarities enable the reasoner to make associations between the source and the target, which can lead to more questioning, more associations, and then understanding of the target situation. Dunbar and Blanchette (2001) asserted that, "Good analogies are those where the source and the target have similar underlying structures" (p. 334), meaning the structures that show high interconnections and "deep chains of higher order relations" (Genter et al., 1997, p. 418). They implied that

breakthroughs are more facilitated by structural analogies than superficial ones since structural analogies are comprised of symbolic descriptions that have structural implications and “include objects, relations between objects, and higher order relations among whole propositions” (Genter et al., 1997, p.417). Breakthrough, or a conceptual change, is based upon the discovery of new features of the target, in larger and deeper alignments than just superficial similarities. Powerful analogies are made when the analogy maker can see structural similarities even though superficial characteristics are different. Dunbar provided an example of how the structural type can breakthrough existing understanding into new discovery with the analogy Rutherford was rumored to have made when trying to understand the structure of an atom: he made an analogy to the solar system (the source or base) and mapped the idea to atomic structure that electrons traveled around the nucleus (Dunbar, 1997, p. 6). However, superficial characteristics are recalled more often than the structural aspects.

Dunbar has extensively studied scientists’ cognition and reasoning from in vivo settings (e.g., naturalistic laboratory meetings) and in vitro settings (e.g., experimental methods usually done in a psychological laboratory) and presented a forceful argument that could be extended to support the assertions by the socioculturalists that the emergence of creative moments is best studied in naturalistic settings (Dunbar, 1997b, 2001a, 2001b; Dunbar & Blanchette, 2001). Dunbar has also combined in vivo and in vitro and maintained that a combined approach can lead to new insight about the components of analogical reasoning (Dunbar & Blanchette, 2001). Referring to the research on ecological psychology and situated cognition,²⁶ Dunbar and Blanchette (2001) built the case that both disciplines

²⁶ Dunbar cited the work of J.J. Gibson (1979), L. Suchman (1987), E. Brunswick (1943), J. Lave and E. Wegner (1991), and C. Hutchins (1996) in Box 1 (Dunbar & Blanchette, 2001, p. 335).

assume that the central component of cognition are not representations in people's minds, but rather in the process of interacting with the environment, in particular contexts. Complex cognitive tasks such as mathematical thought and navigation were enhanced by the environment (Dunbar & Blanchette, 2001, p. 335).

Dunbar's (1997) study was the most explicative of how the kind of talk, sequence, and cognitive combinations show conversational conditions that facilitate creative breakthroughs in the creative collaboration literature for three reasons:

1. He chose to investigate the domain of molecular biology because that domain was one of the most critical, and leading edge domains of contemporary science, undergoing "an immense period of scientific discovery and breakthroughs" (p. 3) and attracted the most creative and brightest scientists. He also chose four leading scientists (and their teams) whose work could discover new biological fundamentals.²⁷ He actually captured a breakthrough occurrence that changed the field;
2. his study was in vivo, and over time, thus capturing real, invested interactions toward a purpose and goals where the group's intrinsic motivation was high; and
3. his "anatomy of conceptual change," the emergence of breakthrough, showed an interplay of more than one cognitive process, as well as social and emotional processes in a series of episodes, which may suggest a pattern for breakthrough moments (p. 14).

²⁷ In one of the laboratories Dunbar (1997) studied, two out of four research projects were so successful they led to scientific discoveries and Dunbar was fortunate to have been present before, during, and after the discoveries were made. One researcher discovered how a new gene guides cell differentiation and the other discovery was how certain cells proliferate in different bodily regions, and this discovery was made in a meeting that Dunbar has labeled "the anatomy of conceptual change" so Dunbar has the actual moment on videotape (Dunbar, 1997, p. 5).

The purpose of Dunbar's study was to determine the moments where innovative scientific thinking occurred from lab meetings in video and audio recording and then analyze the thinking processes involved by looking at analogy use at 16 laboratory meetings from four laboratories. Because he relied on video and audio-recorded data and analyzed utterances and statements, he could capture moments of scientific discovery (or breakthroughs) in vivo, if they happened in one of the four labs.

One of Dunbar's first findings from this study was that lab meetings were a source of creative thinking for the scientists because they tried out new ideas and concepts. This implies that creativity could happen in the regular course of work and not be signaled out as a special idea-generation event. These were not brainstorming meetings per se, but rather had the tenor of presenting, challenging, refining, and generating new perspectives. The format of the meetings involved the scientist first presenting his or her latest research with the senior scientist running the laboratory. The other lab members would ask questions and suggest other experimental approaches, hypotheses, or interpretations. Dunbar (1997) said these interactions were some of the most creative as the presenting scientist was often forced to re-conceptualize his or her initial idea. In one-hour laboratory meetings, scientists used between three to 15 analogies.

Dunbar (1997) identified over 99 analogies, almost all of them (97) biological or within domain. This result was surprising, as Koestler (1964) had hypothesized distant domain analogies as being the richest associative vein for set-breaking or breakthrough ideas. The analogy type was tied to the goals sought (e.g., design experiments, generate experiment hypothesis, explain experiments, and fix experiments). The tasks of experiment design and hypothesis generation are more central to the creation of new knowledge, while the tasks of

explain experiments and fix experiments accompanied the core knowledge tasks. Analogies made from other organisms (e.g., target: a gene in malaria–base: a similar gene in clams) were most often used in generating hypotheses, for the functions of one gene could be mapped over to the target gene. Contrary to most previous analogy research in psychology literature, distant analogies were not used for breakthrough discovery, and from Dunbar’s closer examination of prior literature, the use of distant analogies previously were used to explain experiments, not hypothesize or design experiments (Dunbar, 1997, p. 9). Dunbar inferred therefore that within domain or within organism analogy use could be more associated with breakthrough generation. One of the most striking results from this study is that “analogy is not the only mechanism that comprises conceptual change” (Dunbar, 1997, p. 10).

Dunbar found that in addition to analogy, reasoning about unexpected findings and distributed reasoning within group dialogue and discussion led to more new ideas, inductions, and deductions by biologists. Dunbar noted that there was substantial literature in psychology and the philosophy of science that scientists have reasoning biases similar to confirmation bias when confronted with unexpected findings. Significantly, Dunbar challenged the generality of confirmation bias and noted that in the psychological research, “no actual scientific knowledge [was] involved in the psychological tasks; the to-be-discovered concepts are arbitrary, and the links between hypothesis, experiment and data are straightforward” (Dunbar, 1997a, p. 478). In contrast, another scientific view on unexpected findings is to welcome them and seek their causes, thereby sharpening their focus rather than ignoring it, as confirmation bias research would have us believe. In real scientific environments, Dunbar found that

1. unexpected findings are common by interviewing scientists before and after an experiment to determine if a finding was unexpected, expected, or exploratory,
2. scientists were more likely to engage in theory building with an unexpected finding than ignore it, and
3. the more a scientist has encountered unexpected findings, the more likely the scientist has developed strategies or heuristics for engaging with them.

“Distributed reasoning” can be defined as different group members reasoning about topics such as hypothesis, experiment, methodology, or interpretation of a result and, in the process, adding new inductive and deductive elements to the topic. Dunbar was interested in whether this group reasoning process would help individual scientists generate alternative inductions from data and avoid making limited inductions. Dunbar found that distributed reasoning not only helped scientists make more inductions, but that the passed information to other members of the group then becomes the basis for more cognitive operations. In contrast, brainstorming research emphasized how groups did not creatively perform as well (in terms of quantity of ideas) as individuals. Dunbar’s findings showed how distributed reasoning in groups does generate new ideas, theories, and conceptual change. One of the major differences in Dunbar’s research is that the group members share similar values, knowledge bases, professional standards, and common practices and intentions. The second difference is that the members of the scientific group had a diversity of knowledge that could be applied to the problems.

The interplay of these cognitive mechanisms is observable in his rendition of the anatomy of conceptual change. Dunbar wrote, “Conceptual change has been defined as changes in scientific theories that occur when new concepts are proposed and old concepts

must be radically changed or replaced to accommodate the new concepts” (Dunbar, 1997b, p.485). Kepler’s three laws of planetary motion were an example of a conceptual change--going from the Ptolemaic system (i.e., heavenly bodies orbit in perfect circles around the earth) to what is described as the mechanistic system, (that the earth and other planets in our solar system orbit in ellipses around the sun) that we understand today (Genter, et al., 1997, p. 407). This conceptual change was of great magnitude, and Genter et al. (1997) described magnitudes of knowledge change as “degrees of alteration in the existing structure” (Genter et al. (1997), p. 445). A change in the facts believed is a belief revision, a theory change is a change in the global understanding, and a conceptual change is drastic in that it involves concept shifts that were previously nonalignable or incommensurable beliefs, thus shifting the fundamental concepts that make up the belief structure (Genter et al. (1997), p.445).

Dunbar’s anatomy of conceptual change catalogued the creation of a breakthrough in developmental biology and represented unexpected finding reasoning, distributed reasoning, and the use of analogies that were within one domain and either referred to the same organism or other organisms, not distant analogies. In subsequent interviews made 1 week, 1 month, 3 months and 9 months afterwards, the scientists could not remember the analogies used in the moments of discovery—which meant that after the concept was in place, there was little cognitive need for the analogy again.

The three cognitive mechanisms used substantiates that there could be more than one cognitive mechanism occurring and in combination, and not only one cognitive mechanism is sufficient in the creation of a conceptual change or a breakthrough. In addition to the specific cognitive process findings of Dunbar’s (1997) study, I see a discernible episodic conversational pattern of creative breakthrough with several other emergent factors from the

data he presented. First, in conjunction with the three cognitive mechanisms in a real group invested in their task, it seemed as if the group members felt participative safety to not only challenge and question, but also to reveal not knowing and to show their emotions in the first episode 1 and in the episode prior to conclusion (showing surprise and shouting excitement, as Dunbar described it). I think it is notable that these emotional notations kick off and help to conclude the sequence, showing deep intrinsic motivation and emotional validation. Second, the conceptual change/new heuristic became evident in several linked episodes—when the group challenged their previous assumptions about a unitary construct and expanded to a paradigm shift with a double use of analogy in conjunction with idea generation and group distributed reasoning in the episode prior to conclusion. Conceptual validation is present in the conclusion of their discussion through the use of analogy in Dunbar's study. Last, because Dunbar's (1997) study was in vivo, he recommended using interactional analysis of group cognitive and social processes, and the expansion of this type of research into other contexts to further verify his assertion that the results here are generalizable. I am committed to joining this conversation and further building a model of conversational conditions for creative collaboration in collaborative workgroups. Although Dunbar's report enabled the episodic outline above, and further identified the concrete sequencing, CMM theory could uncover other contextual and narrative interpretations made in the sequence of events, giving more insight into the group generation of creative breakthroughs.

Indexicality and Equivocality

Sawyer (2007) argued that the most creative kinds of talk are indexical and equivocal because those forms offer a more compelling invitation to the listener to participate and

engage. Levi and Pisoni (2007) explained that when people perceive speech, they perceive not only the content of the message but also information about the person who produced the message (Levi & Pisoni, 2007, p. 203) and the contextual resources accessed. These “extra linguistic” forms of information that are bound together in someone’s conversation can be thought of as the medium of the message, and often convey other dimensions or functions that can seem more important than the content of the message itself (Abercrombie, 1967; Levi & Pisoni, 2007; W. B. Pearce, 2007). Indexical speech indicates or refers to and functions as interpretative clues to the symbolic content of an utterance. Non-referential indexicality indicate that in association with one or more contextual variables, there could be several layers of pragmatic meaning present, such as group or social class membership (e.g., taken from dialectal, regional, or social aspects of speech, or indications of deference, hypercorrection), individual characteristics (e.g., age, gender) or the affective states or changing states of the speaker (e.g., excitement, tonality, fatigue, anger, amusement, suspicion, speaking rate, lexical processes such as synecdoche and metonymy, interjections, and inflectional morphology). These various indices shade, color, and shape the meaning of the linguistic message and influence how something is interpreted and then acted upon. Sawyer (2007) pointed out that Hargadon (1998) uncovered an organizational instance of where indexical interaction was preferred and more valuable than straightforward communication access.

Hargadon (1998) studied eight innovative companies for three years and noted that the knowledge brokering activities of all of the companies used indexical communication strategies and fostered equivocal knowledge for innovation. Firms that span industries, as consultancies do, seek to set up situations where their consultants can maximize the wealth of

diverse knowledge bases by increasing access, learning situations, linking one industry's problem or solution to another industry, and combining innovative ideas in implementation (e.g., IDEO, Design Continuum, Anderson Consulting, and McKinsey & Company). Access, learning, linking, and implementation are also important facets of knowledge brokering for multi-divisional companies, and they use various communication strategies to bridge the communication gaps between divisions that typically exist in large firms (e.g., Hewlett-Packard's Strategic Processes and Modeling Group, Boeing's BCAG's Operations Center, Edison & Co.'s Menlo Park Laboratory and Elmer Sperry).

Hargadon found that all eight companies had tried to access and link knowledge with libraries or databases for all of the projects, in a straightforward attempt to cause linkage. However, in each company, their employees did not access or use the database or library for such creative purpose. The engineers, designers, and consultants found the databases useless because their innovation depended on unique ways to contextually reframe and define the problem, as well as the previous solution. Databases, libraries, and previous project collections were made to access something known already, not something that could open the mind to the unknown. Hargadon (1998) found that when ideas were left open to multiple interpretations, and the employees could roll-around with various possibilities, innovation was much more likely, as indirect association catalyzes analogical thinking.

Creative Listening

Moran and John-Steiner (2003; 2004) argued that creativity is in a dialectical relationship with development—not only intellectual, but also social, emotional, and cultural. They based their argument on Vygotsky's theory that creative work is inherently social and “[a]rt is the social technique of emotion, a tool of society which brings the most intimate and

personal aspects of our being into the circle of social life” (2003, p. 61). Development could be conceptualized as an internal process, and from Vygotsky’s theory, emotion animates “imagination, meaning making and the understanding and use of signs...” (2003, p.72). The use of signs, symbols, and delivery of creative product is the externalization of an individual and social process. Because creative production can be emotionally demanding, in creative collaboration, emotional intensity must be negotiated well to continually develop the shared meanings that advance both the creative work and the collaboration. The sensitive attunement and ability to listen to these various dimensions could provide a facilitative condition for creative collaboration (Moran & John-Steiner, 2004; Seddon, 2004, 2005). John-Steiner (2000) found that the most creative collaborations were long-term, voluntary, based in connection and trust. The collaborators also showed appropriation of each other’s work and thinking, complementarity, and had a mutual emotional and professional scaffolding (Moran & John-Steiner, 2003). Creative collaboration is demanding on one’s capacity to offer empathy, support, understanding, trust, and constructive criticism as well as to receive the same, and to do all of this in the face of self-doubt, vulnerability, and possible rejection (John-Steiner, 2000, p. 190). When creative collaboration is enacted, whether in a jazz session, improv skit, scientific group session, or artistic endeavor, in order to achieve originality and risk what has been known, participants often lower the traditional boundaries of the self to bond and explore with the other(s). This deliberate lowering of boundaries, combined with an intention to maximize the advantages of the complementarity within partnerships or collaborative groups, requires an attunement and awareness to the other that enables co-creation.

According to John-Steiner (2000), partners who inferred that people do this well have learned how to employ a kind of listening sourced in joint purpose so each may listen on behalf of the other and the joint project. They also hear each other's words with refined attentiveness and are able to co-construct ideas more ably than if done alone, as John-Steiner pointed out about the Curie partnership and collaborative practices of Niels Bohr (John-Steiner, 2000). Sawyer (2007) also described this listening as creative listening and saw it as an aspect of indirect speech episode, which is highly indexical (context dependent). When a speaker and a listener are engaged in indirect speaking and creative listening, the moments can be most creative for both participants are sharing many possible interpretations and constructions of meaning, which then can result in more of a collaborative creation of the shared narrative. Creative listening is activated if the response of an interlocutor is reflective of a "yes...and..." orientation.

Recent neuroscience research supports the concept of creative listening: Creative listening could also be understood by brain-to-brain research. The central concept of brain-to-brain neural coupling means that the perceptual system of one brain is linked to the motor system of another. The cognitive neuroscience that has begun to focus on what happens between brains reinforces the findings of creative collaboration theorists. In a recent fMRI storytelling experiment between English listeners to either a Russian speaker or an English speaker, researchers found that successful communication involves speaker-listener neural coupling (Stephens, Silbert, & Hasson, 2010). First, Stephens et al. (2010) recorded the brain activity of a person telling an unrehearsed story and then measured the brain activity of a person listening to the recorded audio of the story so the speaker-listener neural dynamics could be time-bound, captured, and compared. At the conclusion of the experiment, a

detailed questionnaire was given to the listeners so that comprehension could be assessed both for the Russian articulation of the story as well as for the English rendition. In a spatial-temporal intersubject correlation analysis, the researchers found widespread coupling during communication amongst brain areas unless the story was told in a language unknown to the listener.

Listeners' brain activity showed two results that are indicative of how central listener participation is to successful communication. The first result was that the listener's brain mirrors the speaker's information flow with slight delays in a matching brain pattern, which reasonably implies that the speaker's processes shaped the listener's neural responses. But the second result highlighted how active and anticipatory the listener can function in successful communication, for a pattern of listener brain activation was noted before the speaker spoke.

The specific conversational usage of speculative talk (metaphor, analogy, indexical speech, indirect speaking, and equivocality) and creative listening reviewed above verify that interactional analysis of the actual speech act interchanges of group members can indicate the creative turns and developments of breakthrough ideas and breakthrough moments in improvisational performance. Dunbar's (1997) study suggested a pattern of episodes (made up of speech act interchanges), marked by three cognitive processes: contiguous and not distant analogy as well as informed inductive and deductive reasoning about unexpected factors and distributed reasoning in group dialogue. I would like to further explore the possibility of modeling a conversational pattern, which extends the work of Dunbar by his notation of three cognitive processes inherent in the creation of a breakthrough from group process in various combinations. Given the importance of language use, as well as language

pattern, I would like to account for the sequential pattern, additional socio-emotive factors involved, and the contextual resources accessed in creation of breakthrough moments.

Design: Creating Shared Meaning that Facilitates Creative Production

Design capability is central to innovation for it brings new futures into existence, primarily through the “human-made world of artifacts” (Cross, 2001b, p.5), as well as the recognition that design is a powerful strategic resource (Verganti, 2003) and has the potential of shifting and creating new meanings socio-culturally (Chandy & Tellis, 1998; Fleming, 2007; Norman & Verganti, 2012; Verganti, 2003, 2008). Design is not simply a matter of “integrated innovation of function and form” (Verganti, 2003, p. 35), or a matter of appearance and style. Rather, design could be defined as how all of those elements combine to give a product or service a message and meaning.

Design research is most often done in a social context and focuses on the reflexive give and take between the practical realities of a situation (product or service) and “that-which-is-not-yet-but might be” (Badke-Schaub, 2007; Lockwood, 2009). The stream of research focused on creativity in design is within a branch of design research termed “the science of design” (Cross, 2001b) and centers upon “changing existing situations into preferred ones” (Liikkanen, Laakso & Bjorklund, 2011, p. 2) through the systematic study of design process and its adaptations and applications of the principles, procedures, and practices that are engaged when designers work and think (Cross, 2001b; Simon, 1996). The practical implications of this creative stage in the whole of the innovation process makes this creative stage important, for it accounts for 75-85% of the eventual costs for manufacturing and marketing support (Dahl & Moreau, 2002).

The cognitive, social, emotional, and conversational dynamics for high levels of creativity in the creative collaboration literature reviewed above are echoed in the design literature. The process of designing is very similar to new-knowledge creation processes from the Dunbar (1997) study.²⁸ Both processes utilize a sequence of steps that follow problem assessment, generate ideas, present, challenge, refine, and generate new perspectives. First, I will discuss the historical logics of design thinking, as it has been similarly equated with breakthrough thinking like brainstorming processes. Second, I will discuss the importance of codesign, cocreation, and the generation of shared understanding as one of the most salient and unique contributions of creative group interactive conditions that the design literature offers. Last, I will discuss how design language has been shown to enact design, which is central to my interest of how specific conversational conditions could engender creative breakthroughs.

I will end this literature review with a summary critique of the core conversation, namely the gaps in the specific conversational conditions or episodic patterns of workgroup creative collaboration taken from the brainstorming, creative collaboration, and design literatures.

Historical Logics of Design Thinking

In order to better appreciate what specific design practices can offer for successful creative collaborations and creative breakthroughs, it is important to clarify some sociocultural aspects of the research on design. Design and design thinking have been

²⁸ Rapid prototyping, or actually building models and trying them out, is a method of refinement most often used in new product design (Brown, 2008). The design steps have also been termed *design thinking* and could be summarized as: (a) understanding the design challenge; (b) qualitative learning about the consumer (client ethnography); (c) reframing analysis; (d) ideation, which includes prototype testing and concept refinements; (e) deployment – achieving the “go” from the client and moving into planning and strategy; (f) design the product further- research the market, generate specific design concepts, make prototypes; (g) Implement with resources assessments; and then (h) manufacturing.

popularized for at least a decade, and the practices of design have been studied and applied to other professional and scholarly domains, such as organization theory, organization change, and managerial discourse (Richard J. Boland Jr & Collopy, 2004 ; Buchanan, 2004; Orlikowski, 2004; Weick, 2004). It is not my purpose here to discuss the transfer of design concepts into these other domains, or to sequester the term *design* for only one professional concern. However, it is my purpose to make some distinctions so as to introduce more rigors into the scholarly conversation. Furthermore, it is important to understand a current debate within the design research literature about the two design traditions (technologically focused design and human-centered design) most likely to produce radical innovation and creative breakthroughs since the transfer of design practices from one of them, human-centered design, have been appropriated as examples of a design approach.

Design thinking research. As a field, professional design is expanding, becoming more complex, influential, and re-imagined as the language, practices, approaches, and knowledge of historical design seep into new contexts such as strategy, health care, policing, disadvantaged families, business schools, and managerial discourse as *design thinking* (Johansson, Holm, & Lojaco, 2009; L. Kimbell, 2011)²⁹. *Design thinking* is the term used for the cognitive activities that come from design-specific actions applied in the process of designing (Badke-Schaub, Roozenburg, & Cardoso, 2010).

Designers are thought of as cultural interpreters. They have created or shifted meanings in the culture with cultural forms: William Morris with the arts and crafts movement in reaction to pervasive mechanization in the beginning of the 20th century, Mies van de Rohe and Le Corbusier as architectural heralders of the possibilities of technology and

²⁹ Those designers who have evolved from a design studio: product design, architects, engineers, as well as designers who graduate from design schools: industrial designers, fabric, interior and graphic designers.

modernism from the Bauhaus tradition, and today, the architect Frank Gehry, who has demonstrated that forms can be playful and not necessarily only follow function. The company Alessi also demonstrated this with their "Family Follows Fiction" project by further investigating what motivates people to buy new products. They attempted to create a new meaning about kitchenware by having people see kitchenware as objects that they want for emotional, playful, and symbolic components in addition to functional use (Norman & Verganti, 2012). Being able to influence and shape the future with breakthrough-designed artifacts is an intoxicating idea. Therefore, design and its entailments have been almost blindly sought and copied under the confusing term of "design thinking." It is important to clarify "design thinking," as it has been used as a model of application to business, public issues, or social problems because it "is meant to encompass everything good about designerly practices" (Kimbell, 2011, p. 289). In this study, my discussions of thinking and design need to be understood in the appropriate contexts and will not start from the premise that because something is a designerly practice, it is therefore good.

Design thinking is a concept that appears often in the popular press, different professional journals, and even academic journals without orientation. Clarification is needed so that this study and its possible contributions to knowledge and practice will be regarded with the appropriate and attendant contexts, and not lumped into a "design thinking" rubric.³⁰ According to Kimbell, Brown, and Nussbaum, design thinking is a descriptor for cognitive processes and associated with the following bolded words (Brown, 2008; L. Kimbell, 2011;

³⁰It is not my purpose here to fully explain design thinking, only to caution the reader in distinctions as well as similarities of the concept to design orientations and practices. For a fuller discussion of the historical development of "design-thinking" within the field of design and its migration into organizational literatures, please see Lucy Kimbell's 2011 article "Rethinking Design Thinking: Part I" in *Design and Culture*, Volume 3, Issue 3, pp. 285-306. I concur with Lucy Kimbell's inferences that any transfer of design practice between the world of design to the world of business needs to be made with the appropriate acknowledgment to the particular design profession, the situated context, and the possibility intended.

Nussbaum, 2011). Yet designing behavior is affected by cognitive, emotional, social, and motivational processes, although those have not been researched (Badke-Schaub et al., 2010). I have bolded the words to indicate the themes or aspects of design thinking that would need further explication in order to successfully transfer one aspect of the design field to another field:

Having a human-centered approach to problem solving, in contrast to being technology- or organization-centered...using an iterative process that moves from generating insights about end users, to idea-generation and testing, to implementation. Their visual artifacts and prototypes help multidisciplinary teams work together. They ask ‘what if?’ questions to imagine future scenarios rather than accepting the way that things are done now. With their creative ways of solving problems, the argument goes, designers can turn their hands to nearly anything. (L. Kimbell, 2011, p. 287)

My discussion here will touch upon the bolded words above as they represent recurrent orientations or practices within the field of design. But unlike some design-thinking accounts, I will not assume that just because those outside of the design world may have a general understanding of those words that they can replicate the designer’s knowledge base in solving a problem that might require a plan or a design.

In their theoretical paper on the foundations for studying creative design practices and review of design thinking literature, Liikkanen, Laakso, and Bjorklund (2011) stated that design thinking research is centered on design cognition, and referred to the seminal contributions of Simon, Lawson, Rowe, and Cross (Cross, 1982, 2001b; Lawson, 2006; Liikkanen, Laakso, & Bjorklund, 2011; Rowe, 1987; Simon, 1996). Liikkanen, Laakso, and Bjorklund (2011) further described that design thinking research divides into two theoretical streams, one characterized by an emphasis on analytics and reflection, of which Schon (1988) helped develop (D.A. Schon, 1988), and the other more influenced by cognitive psychology and problem-solving of individual designers. They also referred to a great deal

of empirical literature that focuses on the tools and methods that are intended to support creativity in the design process, primarily idea generation techniques and methods. The benefits and limitations of this research and idea generation methods for creative breakthrough will be discussed more thoroughly further in this section.

Designers, like professionals in other fields whose characteristics have been borrowed and generalized,³¹ still must attend to and develop themselves in accordance with the standards, practices, expectations, and historical developments of their chosen profession to achieve the designation, *professional*. As Kimbell (2011) argued, design thinking in design practice is situated and embodied. The “thinking” and “doing” of design is not regarded or practiced in a dualistic, separated way. Also, the standards and customs of different design subcategories are not unitary. There are important differences in how particular design professions and institutions have evolved (e.g., engineers, architects, industrial product design, interior design, communication design, market design, etc.).

Last, although design thinking accounts may pay lip service to user-centered design, “they emphasize designers as the main agents of design” (Kimbell, 2011, p. 301). If designers’ orientations and approaches are to continue to contribute to the world, then their framing needs to give acknowledgment to the contexts, processes, and activities from which it is derived rather as a unitary, disembodied orientation or practice. Therefore, when design thinking is invoked, it is more useful to conceive of the influencing variables in the design process and take into account the different design situations (e.g., ways in which experienced and novice designers work and approach designing, project context, or other contingencies) (Badke-Schaub et al., 2010, p. 45).

³¹ Perspectives and practices have been borrowed from social work, psychology (both academic and practitioner versions) and economics into either subcategories or wholly other fields.

Cocreation and Shared Understanding

Codesign and cocreation with clients. In traditional product development research, customers were involved primarily through focus groups. More recently, product development shifted from a “needs-product” relationship to a “client world-designed experience” relationship (Lockwood, 2010; Norman & Verganti, 2012; Verganti, 2003, 2008). Although the designers might retain an expert stance (L. Kimbell, 2011), designers’ clients participation entered into a codesign or a cocreate dynamic particularly after the advent of user-focused design. Design practice research has been increasingly associated with those processes that could also be called codesign and cocreation in that they include any investigations into the users’ or stakeholders’ experience.³² The fuzzy front end of the creative process in design refers to problem assessment, idea generation, and idea refinement activities. The fuzzy front end would then be expanded if the design team or designers seek to codesign with the end-users of the design project.

Research on codesign and the investigations under that title are based on the approaches and evolutions of empathetic and user-centered design, or human-centered design, which can be expressed in four directions (a) enabling the user’s voice to be heard in the design process, (b) giving users methods and tools to share their experiences and design ideas to inspire design concepts, (c) collaborating between designers and users where ideas are exchanged and both participate in a co-created envisioning process, and d) including other stakeholders along with the users in the envisioning process (Mattelmäki & Visser, 2011, pp. 4-5). Although Mattelmäki and Visser (2011) acknowledged that cocreation

³² It is important to distinguish here design practice research from academic research on design. Design practice research is what designers do with and for users and the design concept’s veracity. Academic research on design investigates all aspects of the design process, the designer’s, the success or failure of the designed artifact, etc.

outside design practice research is a larger trend that is signified by openness, collaboration, and partnership, within the context of design processes, cocreation is an important subset of the design practice research process. The degrees and ways that designers can or do involve clients in codesign were discussed by Mattelmäki and Visser, shown in Table 2 below (Mattelmäki & Visser, 2011, pp. 6-7). They mainly concern, and are valuable, in the creative “fuzzy front-end stage”.

Table 2

Codesign and Cocreation Distinctions from (Mattelmaki & Visser, pp.6-7)

| Codesign | Cocreation in Design | Cocreation's Meaning Beyond Design |
|--|---|--|
| <ul style="list-style-type: none"> • Used in a design context as design concept exploration, envisioning (generation) and solution development • An empowering mindset to give voice and tools to those not usually part of design process • Engagement of potential users as well as stakeholder collaboration • Process and tools of collaborative interactions such as sessions, workshops, events for learning and exploration, assessment | <ul style="list-style-type: none"> • Creative mood, mindset, and methods in a co-design process • Sharing of ideas, experiences and expertise • Temporary • Specific to various parts of the design process | <ul style="list-style-type: none"> • Collective creativity as a mindset for collaborative activities • Discussion for openness and exchange • Networking • Crowd-sourcing • Process for creating new values • Service co-creation refers to the moment when delivery of service connects with user • Service co-creation can also be a sharing of responsibilities between user and designers when creating and offering services |

In each of the five cases Mattelmaki and Visser studied, despite the level of engagement of the designers in coexperiencing the content of the “designed” process with the users or stakeholders, the designers retained their expert position. Mattelmaki and Visser said, “Designers facilitate and enhance the creativity of others, learn with and are inspired from other co-designers” (Mattelmaki & Visser, 2011, p. 11). Even in the case of Aalto

University's collaborative envisioning of the activities and spatial solutions of their "Design Factory," where the designers organized and facilitated three workshops and would be end users of the space, the final choices for the respective designs that would be in use were the designers' choices and not the users' or stakeholders'.³³ There is no dispute about the mutual contribution of the collective creativity evident between the designers and the users/stakeholders in the explication of these five cases. The participants valued the learning, exploration, and idea exchange, and the designers valued the users' and stakeholders' insights from their experience and expertise and were inspired by them as codesigners. Codesign and cocreation are mutually contributory and valuable and have been shown to impact the level of creativeness in the design concept (Dahl & Moreau, 2002) as design team cohesiveness in successful design outcomes (Dong, 2004b; Dong, Hill, & Agogino, 2004), but the direct relationship between those processes and approaches have not been explicitly made to creative breakthroughs in the process of designing.

Shared understanding in the collaborative workgroup. Verganti saw design's unique contribution to innovation in terms of "making sense of things", and there are several constituencies across a system that must align in sense making before an idea is implemented (Norman and Verganti, 2012, p. 4). Design could be interpreted as a sociocultural cognitive system that explains how design outcomes happen. If design were only to be described as a cognitive system, the accounting for the critical social aspects of the design process would be missing. The cognitive aspects of design teams depend on their social organization, namely how the communication happens over time and how the team negotiates the development of the artifact congruently within the appropriate cultural

³³ It is unclear how much the process of the three workshops influenced the final design and the plan that was utilized for the DF at Aalto University from the data presented in the case.

contexts. As a system, design has four linked variable groupings that are in a “zone of proximity for social processes” (A. Dong, 2004, p. 3): the design stages, the design activities, the technical tools and methods that enact the activities in drawing and language,³⁴ and the social processes (naming, creating vocabulary, coordinating action, negotiating, testing) participants enact to produce successful design outcomes (A. Dong, 2004, pp. 2-5). Without the eventual shared understanding of a design team, it is unlikely that the resultant artifact or service will meet the initial requirements of the design situation, much less the commitment necessary to launch the artifact into manufacture.

From a 15-week design-period study of the terminological patterns in design text,³⁵ Dong, Hill, and Agoino (2004) found that creating shared understanding and a high level of cohesiveness amongst the design team members was critical to successful design outcomes (Dong et al., 2004). Shared understanding means that the team members see and share a congruent thinking about the function, behavior, and structure of the product, as well as an awareness of how others could interpret the function, behavior, and structure of the product and are able to make similarity and difference comparisons with the team members’ interpretations (A. Dong, 2004, p. 3).

Shared understanding is a necessary process accomplishment so that the technical tools and methods can be employed successfully to produce the design. Without the social processes of shared understanding, the designers’ idea processes and separate object worlds cannot be recombined successfully with the client’s stated requirements and perhaps unknown desires to produce satisfaction. Furthermore, the combination of cognitive and

³⁴ The technical tools and methods are specific to each of subcategory of design practice; for example, the technical tool of CAD is specific to mechanical engineering (Dong, 2004, p. 2).

cultural processes is not observable as a system until it is manifested socially through communication, which is constituted in the iterations of feedback (e.g., design alternatives, analyses, refinements, evaluations) that the team enacts together, with the design challenge as well as with the clients or customers.

Cocreation with the language of the situation. At the heart of design is a reflexive conversation between the situation and the designer. If a designer “gets it right” in the spirit of codesign and cocreation with the design situation, the resultant design or representation will integrate the aspects of the situation uniquely into a new possibility or artifact for a particular design challenge. Cocreation with the situation includes the designer’s willingness to be poised with creative mood, mindset, and methods in an exchange of experiences with the situation (Mattelmäki & Visser, 2011). No matter what specific flavor of design profession, Schon suggested that design analysis and creation shares a generic process that he called “a reflective conversation with the materials of the situation” (Schon, 1991, p.79) so that things could be made (Dong, 2007; D.A. Schon, 1991, pp. 76-104).

Schon viewed design as a complex process of a back and forth conversation between the designer and the situation. As a designer or design team shapes the design with the situation, the situation “talks back,” to which the designer responds in the process of shaping (Schon, 1991, p. 79). For Schon, this was reflectivity. Reflectivity is in all the phases of the conversation: in the understanding of the challenge, the construction of the problem, the different actions the designer takes, and the different representations that the designer makes. Schon defined the language of design as a parallel process of verbal and non-verbal dialogue that encapsulates a congruency of action and meaning in three dimensions, “the domains of

language³⁶ in which the designer describes and appreciates the consequences of his moves, the implications he discovers and follows and his changing stance toward the situation with which he converses” (Schon, 1991, p. 95). Furthermore, by placing this relationship in a conversational frame, Schon made it possible for others to be invited into the conversation or limited in the conversation, according to the designer.

Verganti (2003) took the communication with the situation or the object into a symbolic, cultural, and emotional dimension with his explanation of design-driven innovation. As a beginning recognition, design driven innovation could be thought of as an exploitation of the observation that people have relationships with objects; as an example, talk to anyone about their new car, the tea kettle, their favorite chair, or preference for pens. The strength of the relationship is not simply based in functionality, or form, or even appearance, of the object but implications associated with the meanings that the users ascribe. The meanings ascribed to the object either makes possible what was not possible before or enhances something for the user that is difficult to express.

In his theoretical article offering a meta-model and research agenda for the strategy of design driven innovation, Verganti (2008) asserted that it is the ability to access the potential emotional and symbolic content of products (i.e., their meanings and languages) that distinguishes radical innovation and creative breakthroughs. Verganti’s argument was based on his analysis of three leading and award winning Italian manufacturers’ innovative processes, Alessi, Artemide, and Kartell,³⁷ as well as his and Norman’s observations that other firms who are leaders in their industries for innovation and design are also not user

³⁶ Schon outlined 12 domains and are specific to the clustering or categorization of “elements, features, relations, actions, and norms used to evaluate problems, consequences and implications... that perform descriptive, constructive and normative functions” (1991, pp. 95-96).

³⁷ The industries that these manufacturers represent are kitchenware, light, and furniture, respectively (Verganti, 2008, p. 437).

centered, like Apple or Bang & Olufsen (Norman & Verganti, 2012). The contribution of these firms is that they “developed superior capability to propose innovations that radically redefine what a product means to a customer” (Verganti, 2008, p.437). This has launched a current debate in design management and research. Some scholars and practitioners would say that it is the user-centered design approaches (codesign, cocreation), processes, and ethnographic techniques made popular by IDEO and Design Continuum in the concept generation phase that facilitate creative breakthroughs. These approaches enable the access to latent and tacit meanings that customers value and have led to leading edge innovations (Lojacono & Zaccai, 2004; Sutton & Hargadon, 1996; H. West, 2011).

Instead of focusing on concept generation and the deep immersions into users’ needs and experience as the primary source of knowledge access for creative breakthroughs, Verganti (2003) asserted that there are three types of knowledge essential for innovation processes: user needs as well as “knowledge about technological opportunities and knowledge about product languages” (Verganti, 2003, p. 37). Product language knowledge includes awareness of signs and symbols that deliver particular messages as well as the semantic context available from the socio-cultural context that a user might access to ascribe meaning to the product. By increasing language innovation through messages and radical performance improvement to new functions, breakthrough innovation is achieved. Verganti shifted the usual ancillary role of product language to the center of concern. From his study of these three Italian product firms, he determined that design driven innovation depends on the capabilities of firms to “understand, anticipate, and influence the emergence of new product meanings” (Verganti, 2003, p. 38). He assessed that designers are uniquely suited to

perform the role of knowledge brokers about product languages, and refined and extended the Hargadon proposal that firms are knowledge brokers (Hargadon, 1998).

In contrast to sociologists, whose focuses are on sociocultural models, Verganti described designers as uniquely suited to look into and beneath sociocultural models and language to discern the new, unexpressed emotional needs of users. To do that successfully, they need to have various channels to access the signs, symbols, and tacit knowledge that are emergent and perhaps not fully visible so they can apply them to products. Therefore, their research expands from research on technologies and opportunities to research on languages and layers of meanings that are fluid and move across contexts and domains (Verganti, 2003, p.40). Design driven innovation is intimately linked to an intense research process that involves interacting with the top executives of the client firms as well as across a broader context. Research between designers and others is needed, for instance, with suppliers, other manufacturers, other consultants, to discern messages from the widely dispersed, but inter-dependent and continuous design discourse and dialogue. From what is desired and foreseen across industries and contexts, designers can further discern the various messages that stand-out as potential innovative concepts.

Specific Communication Patterns Enact Design and Creative Collaboration

Hargadon and Bechky (2006) were interested in finding out more about the collective phenomenon of “when creative insights emerge” (Hargadon & Bechky, 2006, p. 484). Prior studies looked at the phenomenon of collective creative generation in either an individual context (psychologybased, sociocognitive literature) or the collective process with an organizational context that favors ongoing conditions (organization innovation literature), but the moments of flashing creative insight were not traditionally studied.

Hargadon and Bechky (2006) grounded this study in observations of work (meetings and brainstorms), interviews, informal conversations, and the archived data from their other field studies, namely those of professional service organizations that are the foundation for Sutton and Hargadon (1996, 1997). The firms³⁸ chosen for their study represent a theoretical and not random sample as the groups studied within these firms delivered creative products regularly (A.B. Hargadon & Bechky, 2006, p. 487).

Although Hargadon and Bechky (2006) did not classify the level of creativity, they defined the collective creativity as a series of intermittent moments of creative leaps or bridges of insight from social interactions between people and found four interactional activities that help group and organizational creativity. The activities were (a) help seeking, (b) help giving, (c) reflective reframing influence each other and reflect, and (d) reinforcing behaviors that are influenced by an organization's values, behaviors, and structures that support individuals as they engage in the three other activities.

The researchers reported that the data showed fluid patterns of help seeking from others to meet challenges or solve problems in routine, regular, and informal methods to get help, versus prior studies where help seeking behaviors were characterized as fixed (Weick & Roberts, 1993). Yet the researchers did not show these fluid patterns and how they came about. While they stated that appreciation was shown for tough problems in these organizations, which encouraged asking for help, for greater understanding and practice it would be most useful if the "appreciative ways" were explicitly demonstrated. Help giving is the willing contribution of time and energy by people to the work of others, and was observable through the responsive and timely attention that was paid when an informal or

³⁸ Accenture, McKinsey, Hewlett-Packard Strategic Processes and Modeling Group, Boeing Company's BCAG's Operations Technology Center, IDEO Product Development, and Design Continuum.

formal request was made. Reflective reframing is the nexus of creative insight and listening, and the behaviors of adding ideas, comments, and suggestions of all participants with an intention to build on the comments and actions of others were the ones observed that helped reflective reframing. Creative insight could also be described as shifted awareness that makes new sense of what is already known or creates new questions around a problem or opportunity.

Although the identification of these activities and their interactions are described and have shed more light on how creative moments emerge, they fall short in their description of the patterns that could be most conducive to collective creativity. For instance, it would be helpful to more fully understand, as well as replicate, the reflective reframing patterns of interaction and what conversational conditions lead up to and constitute those actions. Creative actions shift contextual perceptions, and although Hargadon and Bechky's (2006) study inferred these shifts, it was not clear how they happened.

The most specific and relevant research to my concern of the conversational conditions that facilitate creative breakthroughs in design teams is the scholarship of Andy Dong (Dong, 2004a, 2005, 2006, 2007; Kleinsmann & Dong, 2007; Wang & Dong, 2006), who used latent semantic analysis (LSA) methodology to study how language enacts design. I refer the reader to his full description of that computational method in the paper that was awarded the Design Studies prize in 2005. Briefly, LSA takes text and computes co-occurrence of vocabulary, coherence of thought, and the socially held representations of an artifact. Dong showed in his 2005 study that LSA can provide an empirical scaffolding that demonstrates that language and the meaning of words "is a facilitator to bridge gaps of knowledge between what individual team members know and the larger body of experience

held by the team” (Dong, 2005, p. 447). Dong constructed a communication theory of design from these various studies.

Dong asserted that language and communication is not merely representational (like Pearce, 2007), or merely descriptive of design, but rather the language use of designers has consequences in that “[the semantic and grammatical forms used] reflect the meaning potential of the designed work that is intended by the designer and stakeholders, a meaning which eventually becomes inscribed in the designed work” (Dong, 2007, p. 6). In this review article of his own work (Dong, 2007), Dong theorized on the performativity of the language of design, proposed a communication theory of design, and claimed that language enacts design through three main functions: (a) aggregation or the blending of ideas and concepts; (b) accumulation, or the scaffolding of ideas and concepts; and (c) appraisal, which evaluates ideas and concepts (Dong, 2007, p. 6). Dong’s theory of the performativity of design language was based on Austin’s (1962) speech act theory and Butler’s (1993) performativity theory of gender. Dong saw that the performativity of language was a matter of the social system of meanings more than agency and that “the historicity of discourse, and, in particular, the historicity of norms constitutes the power of discourse to enact what it names” (Butler, 1993, p.187 as cited in Dong, 2007, p. 9).

Dong’s findings from his LSA studies on the 1994 Delft Protocols Workshop (Dong, 2004, p. 525) and the Bamberg Study (Stemple & Badke-Schaub, 2002) of design thinking in teams based in their communication showed that the performativity design language theory contributed ways to see domain specificity and coherence, and affected interplays in design team communication. He proposed a coding scheme that could be applied to designers’ interactional text to show how the underlying function of design language impacted the

social functioning of design using the assessment categories of aggregating, accumulating, or appraising. The corresponding sets of determinants within each signified how the message in language also regulated the carried design and proposed plus (+) or minus (-) signs to indicate positive or negative assessment (Ag+/Ag-/Ac+/Ac-/Ap+/Ap-). In his comparison of MIT's Mechanical Engineering mission statement and Harvard's Graduate School of Design and Architecture (Dong, 2007, pp.16-17), Dong showed that MIT's Mechanical Engineering commitments were strongly accumulating (strong relationships to established practices) and aggregating (well-defined boundaries and not open to other fields) though weakly appraising (only technical rationality appeals). In contrast, Harvard's School of Architecture was strongly accumulating and appraising but weakly aggregating in that it is inclusive of other fields.

Dong's descriptions of aggregating, accumulating, and appraising contributed significantly in that mapping of what occurs in design practice and how language enacts design. Although this MIT and Harvard analysis confirms common knowledge, the value of the example is how the theory of the performative nature of design language can reveal ideologies behind the "design is" statements of the different professional branches. Dong has not yet used his theory to assess what conversational conditions facilitate creative breakthroughs, nor is his theory of the performativity of design language complex enough to expose the various contextual elements at play in the combinatory contextual narratives used by designers as they think and work.

Summary Core Argument and Research Question

Collective creativity in collaborative practice is related to how members (and their stakeholders) can access and recombine knowledge to produce novel and appropriate

products or designs through free association and knowledge sharing, knowledge re-use, combination and building, feedback and challenge, and cocreation and shared understanding. Each sub-section of literature reviewed contributes to an understanding of what happens in collective creativity. However, the previous research addressed in each sub-section has also left something out that is critical to the discernment of the interplay of sociocultural, cognitive, social, and emotional processes involved in the production of creative breakthroughs.

Sociocognitive research has significantly helped the understanding of cognitive setbreaking and cognitive reappraisals, the core of new heuristics, but the research has lacked in situ studies and been too focused on internal processing. One of the main complaints that sociocognitivists have about the study of brainstorming and collective creativity in real-world settings is that it is too difficult to control variables and to track them because many influences occur simultaneously in the group creative process. The Hargadon studies discussed above focused on the intersection of collective creativity and mindful interrelating as an example of collective mind (Weick & Roberts, 1993). Hargadon and Bechky (2006) even noted that the creation of new meaning can reach back in time and reframe thinking and action when they said,

When one person's action or comments, when considered by others, shapes theirs, which in turn (when heeded) shapes the next. A focus on the collective aspects of these interactions recognize that one person's past thinking and action take on new meanings—to everyone involved—in the evolving context of subsequent thinking and action, (Hargadon & Bechky, 2006, p. 486)

It is this tradition and this specific core conversation that I would like to join. In this study, as well as in Kohn, Paulus, and Choi's (2011) study above, a combining process is described. In the Hargadon and Bechky (2006) study, a description of linking gave more

insight into how this happens, but still treats communication as the medium in which it happens instead of considering that the communication acts and patterns are constitutive of it. Socioculturists are sensitive to context as the above Hargadon studies showed, but do not demonstrate how and in what form various actions are taken. I think that CMM could help us understand the collective creativity process better by providing a lens with which to view those different influences. In addition to helping the patterns of creative actions and meaning making in groups with episodes and the serpentine model mentioned above, CMM could also allow researchers to develop a richer contextual understanding of collective creativity.

One of the most important contributions of the creative collaboration literature is the validity of interactional analysis to the study of collective creativity, which has shown that the more collaborative the behavior is, the more collaborative the learning is that leads to more radical innovation and creative breakthroughs (Post, 2012). The creative collaboration literature has given the greatest insights into the importance of how the social process of communication and interaction shape the inter and intra-subjectivities involved in the production of highly creative moments in the improvisational literature (F. J. Barrett, 1998; Sawyer & DeZutter, 2009; Seddon, 2004, 2005), research on creative partnerships and collectives (Vera John-Steiner, 2000; Moran & John-Steiner, 2004), and specific language use (analogy, indexicality, equivocality, and creative listening) with cognitive processes (Amhag & Jakobsson, 2009; Dunbar, 1997b, 2001a; Hargadon, 1998; Hasson, Ghazanfar, Galantucci, Garrod, & Keysers, 2012; Stephens et al., 2010). What is missing, however, are conversational practice models that stimulate creative breakthroughs.

The conversational interactions of design project groups and teams have been studied, empirically and with some in situ design projects, though it is more difficult to control for

variables (Cross, 2001a). Verbal protocol analysis (VPA) and other semantic analytic approaches (latent semantic analysis, LSA) have often been used to investigate how design groups interact and solve authentic design challenges, both in experimental studies as well as in situ (Christensen & Yaşar, 2007; Dong, 2005; Dong, Davies, & McInnes, 2005). However, they have treated the communication as representational rather than as the essential constructive medium of what is possible. Those who have treated language as the constitutive medium for design (Dong, 2007; Hargadon & Bechky, 2006) did not fully explicate how action and meaning combine to produce particularly creative solutions or creative breakthroughs. Those who recognized the power of design language and the creative process for causing breakthroughs or radical innovation (Verganti, 2003; Norman & Verganti, 2012; Mascitelli, 2000; Sutton & Hargadon, 1997) added depth to our understanding of the ability of designers to act as protean brokers for tacit and experiential knowledge sharing, but stopped short of providing clarity on the conversational practices, conditions, and patterns within a group that lead to breakthrough innovation.

I argue that the essential shift for creative breakthrough involves leaps, shifts, or changes in meaning around what could be possible, and this happens through communication practices that reflect various layers of context: sociocultural, organizational, group and episodic interactions, as well with interpersonal interactions between actors in the process of creating or designing. If breakthrough generation then turns on meaning making and management with coordinated actions, then what is needed is a way to discern the subtleties of what actors say and do in the essential communicative process of creative collaboration. The literature lacks in situ studies that reflect the specific conversational practices that are engaged as collaborative groups make creative breakthroughs. The literature also lacks a

robust communication theoretical treatment that would further add nuanced understanding about the contextual interplay of meanings and actions that result in creative breakthrough generation. As knowledge brokers or facilitators of creative breakthrough and increasing creative production, designers may need greater awareness and competencies to expand facility with interpretations so that people do not become mired in their own particular object-worlds,³⁹ limiting not only shared mutual understanding but the generation of new meanings for a product or service (Bucciarelli, 1988; L. Kimbell, 2009; Kleinsmann & Valkenburg, 2005). This is ironic because design is often represented as a language or a brokering of languages and serves rich examples of shared understanding and meaning-making, co-creation, co-design, and collaborative work (Dong et al., 2004; Hargadon, 1998; Kleinsmann & Dong, 2007; Mattelmäki & Visser, 2011; Verganti, 2003).

Research was conducted on the question, “What conversational conditions facilitate creative breakthroughs in collaborative workgroups?” that built upon the core conversations of Dunbar, Sawyer, Barrett, Dong, Verganti, Hargadon, Cross, and others, and the scholarship discussed herein. The following Methods chapter describes the methods used in relation to this question to gain further understanding of the specific communicative acts and the companion multiplicity of meanings that are present in creative breakthrough moments.

³⁹ An object world is composed of individual beliefs, knowledge, preferences, interests, and experiences particularized to an individual. During collaborative processes, participants representing different backgrounds, experience, and expertise sets and knowledge bases tend to communicate as if his or her object world is the only “lived” world and communicate on various levels and from various contexts. This can block or hamper cooperation, collaboration, and shared mutual understanding (Kleinsmann & Valkenburg, 2005, p. 147).

CHAPTER THREE: THE RESEARCH PROCESS

The previous chapter reviewed some of the theoretical concepts and research that have shaped this study. Although meaning making has been acknowledged as essential to creativity and creative collaboration, the explicit ways in which meaning is made through the communicative, contextual, and interpretative conditions in group conversational practices (what people actually say and do) have not been studied. I have chosen to study the case of the Distinctive Greetings Project, a product design collaboration between a senior design class at Levenger University and a design consultancy, C4 Innovation, in their over-the-web semester's collaboration for the client, Distinctive Greetings, Inc.⁴⁰

This chapter discusses the research methods used to answer the research question, What conversational conditions facilitate creative breakthroughs in collaborative workgroups? Sawyer, John-Steiner, Dunbar, and Dong strongly propose that the sociocultural phenomenon of creative group interaction is best studied by qualitative, interactional methods. For this dissertation research, my methodological approach was a qualitative, constructionist case study that integrated discursive conversation analysis (CA) (Buttny & Jensen, 2002), CMM communication theory and methodology (V. E. Cronen, Pearce, & Snavely, 1979; W. B. Pearce, 1989, 2007; W. B. Pearce, Cronen, Johnson, Jones, & Raymond, 1980), and figurative language and improvisational principles taken from organizational theory (F. J. Barrett, 1998; Weick, 1998a).

Below, I provide a description of the case and its context, participants, and the research design and methods used for data collection and analysis.

⁴⁰ The names of the institutions are pseudonyms.

Characteristics of this Case Study: An In Vivo Creative Collaboration–The Distinctive Greetings Project

Background and Rapport Established With Gatekeepers and Organizers of the Project

I centered my research interest on a product design collaboration because I thought that it best mimicked the conditions of many organizational collaborative workgroups, where participants need to formulate and produce something creative in a collaborative way under short timeframes. In November of 2011, while on a site visit to the Design Department of Levens University, Professor Ned Robinson invited me to consider focusing my research on a possible collaboration experiment between an elective, independent-study, fifth year product design class (LS or Levens students) and the Boston office of C4 Innovation, a design consultancy(C4) for Distinctive Greetings, Inc. At the time, he hoped that the collaboration would involve frequent participation among all organizational entities. Depending on further institutional approvals, the collaboration was scheduled to happen weekly during the following spring semester, over the web through Adobe Connect. Adobe Connect would allow for each session to be videotaped and recorded, as well as allow participants to view drawings, PowerPoints, each other and, subsequently, retrieve anything from the sessions asynchronously.

Professor Robinson's offer seemed like a unique and unobtrusive way to capture the in vivo conversations that might possibly inspire breakthroughs in the creative process. Recorded sessions could allow for the continual review needed for in vivo conversational analysis and place the researcher in the background. This particular collaboration provided added complexity and dimensionality by being interorganizational, between highly regarded design institutions.

The 2-hr sessions were on an open-ended design brief over a 4-month sequential period, weekly, with C4 (and Distinctive Greetings as often as possible) between January and May 2012. The students and Professor Robinson would also meet in another session (without C4 or using the Adobe Connect recording capability) weekly, to review and further the design process. To further establish rapport with the project's sponsors, after meeting with Professor Robinson, I made a trip to Boston in November of 2011 and met with two envisioners, Tulip and Jack, to learn about their process and for them to interview me about my research purpose and feasibility with their interests. Based on their recommendations, Violet Rogers, the manager of the Envisioners and the proposed C4 organizer of this project, agreed to incorporate these research interests.

Particular Background Issues of This Case⁴¹

As Cronen, Pearce, and Snavely (1979) noted, the history of a relationship provides a context that shapes communication. Therefore, the prior relationships inherent in this collaboration need to be noted. This collaboration had its genesis between George Zaffron, the alumni supporter of Levenson and founder of C4 Innovation, and Professor Robinson, a senior Co-lab Fellow of the design department at Levenson University. Additionally, three of the four C4 participants, Violet Rogers, Wendy, and Wayne from C4 were also former students of Professor Robinson and alumni of Levenson University. Professor Robinson and Ms. Rogers were the key organizers and managers of this project.

Institutional intentions and goals in collaborations also shape action and communication. Robinson reported that the founder's intention for this project was mutual benefit for design education and design consultancies. Both Robinson and Rogers were

⁴¹ The background issues discussed here are all based on the data obtained from the Organizer Interviews of Violet Rogers, Professor Robinson and Joe Smith.

committed to the expansion of collaborative relationships between their institutions as well as the production of unique and excellent creative design. Both were also committed to the experiment of a university and design consultancy producing design solutions deemed valuable by the client while simultaneously developing design and collaboration competency for the students. Robinson's more specific goals were to increase graduating student employment with either Distinctive Greetings or C4 and have Levens University become more known as an institutional connector between industry and design consultancies. Rogers saw that if the students generated interesting ideas and new tweaks on different mechanisms for collaboration, they could be used more widely and presented at conferences or sales proposals that would then benefit C4's current spot leadership effort. The C4 founder did not have daily operational accountability for the management of the design consultancy, and was not involved in the implementation or the review of this project.

Joe Smith, the Collaboratory Manager of Distinctive Greetings, was interested in finding ways to appeal to and attract a younger demographic to Distinctive Greetings' products and services. Distinctive Greetings was clearly losing market share to the Internet and needed to secure other and younger revenue streams for long-term viability. Yet, aside from these broad purposes, none of the participants' specific goals, nor the founder's specific purposes, nor the particular organizational outcomes, were used to align and course correct the project as it unfolded and encountered challenging issues. These contributed to the contextual group conditions for this collaboration.

Structural challenges to this multi-party collaboration. This project encapsulated many structural challenges to a multi-party collaboration: namely, inconsistent client participation (and various team participants), the difficulty of staying in communication both

within interactions and in project management, and role confusion between C4 and the university participants, exacerbated by the lack of clarity for final outcomes with an open design brief. In addition, at the onset of this collaboration, intellectual property disagreements among the institutions foreclosed Distinctive Greetings' occasional participation in the weekly sessions as the client, which changed the course of collaboration in late February, approximately 6 weeks into the collaboration. However, Distinctive Greetings did find a way to nominally participate as a client by their the open design brief they provided the students. They asked that the students design a communication product that was focused on a a fractured relationship situation that would need interactive communication to resolve. This shaped the parameters of the creative efforts and asked participants

To start with a scenario that depicts an inflection point in the life of a single individual. As a reaction to this moment in time, they must communicate to friends and family their inner thoughts and emotions. This could be the loss of a loved one, the celebration of a marriage, or simply feelings that might go unexpressed. Therefore, the brief or starting point will begin with storytelling and scenario-based character development. Throughout the semester, we will work with XY to generate a series of physical and digital artifacts that evolve (based on the characters) and the story throughout the semester.

The end-of-semester deliverable from this effort will be the creation of personalized mementos. If we are successful, these might be valued by the family as archival items that are shared and passed on to others. (Class Communication from Professor Robinson to students, 2011)

Due to unforeseen roadblocks with intellectual property claims amongst the three sponsoring institutions, Distinctive Greetings' Head of the Collaboratory unit, Joe Smith, participated only in a final critique at the close of the semester in May. However, as the potential client, he wanted to provide some insight as to what Distinctive Greetings' was concerned about. To assist the participants in capturing the mood of fractured relationship

conditions and to spark ideas for the students' potential designs, Distinctive Greetings suggested that the students watch a documentary about the Sherman Brothers. Although they had a long-standing, successful collaboration creating music and songs for Disney for 20 years, the Sherman Brothers had less and less of a personal relationship as their collaboration went on. Their relationship ended in the two brothers not speaking, and dropping all familial communication. The challenge, therefore, included taking a difficult communication life pattern, such as the kind of falling-out the Sherman Brothers experienced, and altering it through a product or message associated with Distinctive Greetings.

Additionally, due to a change in C4's operational management, this project received less attention and dedicated personnel resources from C4 than originally intended. Violet Rogers' promotion to head the strategy division of C4 limited her participation due to an increase in duties and adjustments to her new role as a leader of the group. Only one C4 envisionser, Tulip, was consistently present for each and every session, from beginning to end. Sessions were held on Friday afternoons, during C4 lunch hours, so the design professionals could multitask by eating their lunch while working with students, maximizing billable time. Furthermore, the only meeting between the two groups was held over the Internet. C4 wanted an in-person session with the students early or by midterm in Boston to meet, brainstorm, and have a prototype day to work in the shop and build various models, but due to other fifth year student projects and other constraints, this did not materialize.

A change of collaborative focus due to the design brief. By the second or third session between the Levenser students and C4, more guided structure was needed because the client was not likely to participate directly, and it was increasingly difficult to generate spontaneous conversation around ideas and concepts across the internet divide. Additionally,

the design professionals reported that such an open-ended design brief demanded more client-focused design skills than the students possessed, and more guidance and coaching than they could provide given their own situation at C4. Therefore, they suggested that each student use the overall open-ended design brief as a challenge, and further refine it by designing a more specific design problem brief that they would individually solve with the help of C4 and the group(s).

The initial goal of C4 and the design students was for them to work on one or two designs for Distinctive Greetings together in more of a co-equal partnership. This then shifted to become each individual student working to generate a specific design problem and design solutions for a final design concept that would be further refined by C4 critique and group(s) participation. For any observer of the recording, the modality that would describe the overall pattern would be “present and critique,” rather than a mutual dialogic creative collaboration.

Research Methods and Design

Research questions. The research design and methods selected were chosen to answer the primary questions: What conversational conditions facilitate creative breakthroughs in collaborative workgroups? What do people say and do that facilitate creative acts and creative episodes? What patterns emerge?

This single, instrumental, bounded case study was well suited to this atypical project, since the design brief was so open, focused on a communication challenge that if successful could produce a breakthrough by bridging a gap in a relationship. It also had the advantage of offering multiple situations involving conversational conditions of the creative process to study, because the class spanned the length of a semester and involved participants from two different organizations. Although this was not a multiple case study design that could utilize the logics of replication (Yin, 2003), this case does offer multiple perspectives of the specific

conversational conditions of participant-selected creative segments that are analyzed in this case study, due to the variety of in-depth sources of data on each creative segment chosen. Creswell (2007) cited Yin (2003) and argued that the mark of a good case study is that the researcher uses at least six different sources of information (e.g., observation, interviews, audiovisual materials, documents, reports, artifacts, etc., (Creswell, 2007). This study included seven forms of data collection as described in the following section under Data Collection.

Participants chose three creative subepisodes of promising creative segments from their weekly sessions. Captured in vivo through videotape recording, these are the data analyzed in this study. From each of these creative vignettes (the Bailey, Dora and Samantha vignettes), further subepisodes were discerned for the presence of creative breakthroughs according to the above description and five further criteria (explained in Chapter 4). Specific and general conversational conditions present during creative breakthroughs were determined from data collected in April 2012; only specific conversational conditions were shown to facilitate creative breakthroughs. The phenomenon under study is captured in text as conversational analysis that shows the variety of technological occurrences which affected how the visual designs could be seen or understood, talking, paralinguistic factors, and other communicative acts made with the body, voice, tonality, cadence and affect during a conversation. These data are analyzed according to the three methods and discussed as supporting evidence to the vignette themes and findings presented in Chapter 4.

Detailed descriptions of the data collection and analysis phases are presented further in this chapter. Next is a description of the research design and approach, which also

informed my construction of the protocol instruments used in the data collection and analysis of the data.

Research Design and Analysis Basis: Conversational Analysis (CA) and the Coordinated Management of Meaning (CMM) Approach and Heuristics

Researchers who use both conversational analysis (CA) and coordinated management of meaning (CMM) share an inductive analysis of sequential speech acts in turn-taking order to discern patterns of how talking action makes things happen (Buttny & Jensen, 2002; V. E. Cronen et al., 1979). Conversational analysis relies on the careful transcription and interpretation of turns, made up of vocalizations, body gestures, communication modalities, and emotional valences of the participants by the researcher using audio or video recordings.

Yet, even with many hours of painstaking transcription, all of the data is an approximate rendering, as scholars note that the recordings contain more information about the conversational conditions than a transcription ever would since the transcription process is primarily linear, and more information is given than can be notated in text. Textual transcription of CA has two parts: the actual words and utterances spoken, and the way speakers use their words are also part of the data set in conversational analysis using elongations, pauses (in various lengths), emphasis, interruptions, overlaps, laughter, inflections, pitch rises and falls, drawls, intakes of breath, and other variations are all part of the CA coding schema (Antaki, 2002; Buttny & Jensen, 2002). Some of these particular examples of timing, emphasis, and overlapping, and other forms of communication such as laughter are indications of meaning-making as well as the content of the words and the structure in which they are arranged. Notations of facial expressions, hand gestures, and other body movements were also made, but with less precision than with what was said, even though I attempted to make those descriptions as neutral as possible.

Conversational analysis and CMM privilege what the participants in the situation see and hear, as both approaches trust that participants in an interaction are engaging to be understood and to have their coordinated actions mean something (Schegloff, Koshik, Jacoby, & Olsher, 2002). Both methodologies show how interaction is multiply contingent. Their use aids the researcher to observe what is noticed or not and the kinds of responses hoped for, given, or not, as well as the relational moves within interactions; for example, teasing, joking, and attempts at greater connection (Harvey Sacks, 1992; H. Sacks, Schegloff, & Jefferson, 1974).

Consistent with the principles of taking a communication perspective and using the communication concepts and heuristic models of CMM as a research methodology (W. B. Pearce, 2006), the interview construction and subsequent analysis were informed by existing theory on creative breakthroughs and creative collaboration (Dunbar, 1997b; Hargadon, 2003; Hargadon & Bechky, 2006; Hargadon & Douglas, 2001; K. Sawyer, 2007; Sawyer, 2004b; Sutton & Hargadon, 1996). The protocols to show how meaning and coordinated action combined were in part, based on some of the key concepts and heuristic models of CMM. An example of some of the final interview protocols and the intended concept or analytical framework targeted is under the “Instruments” section below.

The CMM key concepts of embedded stories and social forces in coordination and coherence through the explication of speech acts and episodes provided levels of transparency for a design workgroup’s collaborative and creative processes. Coordinated action was not separate from the worlds of meaning-making, nor was meaning-making the only salient feature of communication in this case. A sequential timeline of speech acts embedded within a hierarchy of stories helped to show patterns, story change in subsequent

conversations, and emergent creativity and breakthroughs. Patterns could not be accessed or assessed without both accounting for what was actually said and done as well as the meaning that was made with each turn or cluster of turns. Coordination was examined by noting the specific language acts by particular actors in the workgroup design process in a mapped sequential timeline of speech acts and episodes of turns, known as the CMM serpentine heuristic.

The embedded stories fall across a nuanced, temporal range. Part of the human condition is to make meaning and narrate our life happenings in stories to add coherence and make sense of events, thoughts, feelings, interactions, sequences, and aspects of lived experience. It could also be said that designers shape the lived experience and stories of how others interact with their social worlds and will act with their social worlds in the future, as well as negotiating their own in the making. The stories we make are not necessarily about experiential truth, but rather constitute the events and ephemera they reflect upon. As Denzin says, “Narratives are reflections on—not of—the world as it is known” (Denzin, 2000, p. xiii), or as designers want it to be known. Therefore, the investigation of how the participants in this study constructed coherence matters not just for the group’s understanding of itself, or the individuals involved, but also for a deeper understanding of the design process. Any act could also include configurations of meaning that drive action, from feelings of oughtness or frustration, to reverberating stories that exist in the background such as untellable, unheard, unknown, or untold stories that are similar to or related to the current moment that provoke “particular ways of thinking about relationships among stories” (Pearce, 2006, p. 14), to stories that are attractive and compel the co-evolution of action for a particular future. But things are sometimes unknowable or deliberately left ambiguous, for

in the construction of new stories and designs for use, designers cannot know all the possibilities of a particular solution. They have to form it as much as they can and point to possible use so as to ensure multiple interpretations that will secure its longevity.

Participant Selection, Communication, Data Collection, and Management

Participants: Target Population and Participant Selection

The population for this study included university professors, managers of design groups, design professionals, and undergraduate design students. The employees of this study work full-time for the design consultancy and have interactions with other university design students intermittently as a function of their employment. The manager of the design consultancy strategy group has had experience with inter-organizational collaborations, as has the manager of Distinctive Greetings Collaboratory. The professor has arranged for organizations to function as a client for various design classes and groups over a number of years.

The participants of this case study were four students and one professor from Levens University (Rick, Nancy, Dora, Samantha, and Ned), three employees and one manager from C4 Innovation (Tulip, Wendy, Wayne, and Violet), and one manager from Design Greetings, Inc. (Joe). The sessions were weekly, in one and a half or 2-hr blocks, at lunchtime on Friday afternoons held in an over-the-web conference, video-recorded between January, 2012 and ending in May, 2012. All of the students and Professor Ned Robinson attended all the sessions. The C4 Innovation participants were not always present, nor present for the whole sessions. Only Tulip from C4 was a constant presence. The participants agreed to the requests of this case study as outlined in an informed consent about

the study.⁴² The students received a grade for their efforts as a part of their academic coursework. The C4 employees did not receive anything extra for their efforts aside from the knowledge that they fulfilled an intention by the firm's founder to explore and expand the possibility of a closer, empowering relationship with the Levenger Design Department. Their primary role in this research was to function as participants in the Distinctive Greetings Project and to reflect on their experience in anonymous questionnaires, individual interviews, and in a group interview facilitated by me.

Participants were invited by an IRB approved email outlining the risks and benefits to their participation in this study. The email sought their informed consent to participate without coercion or repercussion. Those who declined cited other responsibilities as their reasons of declination. Additionally, each participant was reminded throughout this study that he or she could decline participation at any point. Each participant was shown their own final interview transcript and invited to delete any or all portions of it for my use in analysis, and only one participant did so.

I did not begin viewing the videotaped sessions of the Distinctive Greetings Project until I received all informed consents in early April 2012. All were invited to give me pseudonyms for this study, and only one person accepted and gave herself a pseudonym. I have assigned random pseudonyms to all other participants, as well as to the sponsoring institutions to protect their identities. Those employees, managers, and design department administrators who have declined to participate in this project or the Distinctive Greetings Project have been excluded as well as any students who declined.

⁴² All communications made to participants were approved by two university IRB Boards; Informed Consent, Email invitation to participate, acknowledgment receipt of informed consent, thank you and announcement of the availability of the results, and an information sheet handout for the participants. Given I have disguised the institutional names for this study with pseudonyms to include those documents would transgress my intention to protect their identity, and are available only by writing the researcher.

Data Collection: Approach and Data Collection Management

Data Collection

The data collection and analysis processes were layered, multifaceted, and recursive. They were organized to capture an in vivo conversation during the sessions and then to subsequently interview participants about background meanings per creative vignette, and about the overall Distinctive Greetings Project. To obtain a rich confluence and description of the conversational conditions about creative breakthroughs and the design process, five data collection events were planned and organized around anticipated breakthrough examples obtained from the Adobe Connect videotapes of the weekly design sessions. However, due to unforeseen circumstances, I obtained seven sources of data, as more fully described below.

Choice of the Creative Vignettes Amongst all the Data

Early in the design of my research study, I realized that a semester's worth of weekly videotaped sessions (first data event) of 2-hr each would yield a lot of videotape viewing that could be overly laborious and unfruitful. I decided to ask the participants (in a weekly anonymous questionnaire) about the most promising creative and most troubling moments in their sessions so that I could further curate the most creative episodes. My second data collection event, the weekly questionnaires, did not yield the depth or breadth of what I expected, so I will explain below how I made adjustments and selected the creative segments to study, which are the backbone of my analysis and to which the other data collection events are tied.

1. Approximately 17.05 hr of overall videotape were reviewed out of a total of 25 total hr possible of videotaped conversations between DS and C4 recorded over weekly sessions. Of those 17.05 hr, I then reviewed three specific segments for another 12 hr, and in the transcription of the conversational analysis document of three subepisodes of those

segments I spent 35 additional hr on each of the three selected subepisodes, for a total of 134.05 hr;

2. Alert to the need to boundary data collection in case study design (Creswell, 2007), I included a four-question anonymous questionnaire that was intended to elicit but not seed the most creative moments or promising creative interactions within each weekly session so I might find a consensus and analyze only those. The four questions were as follows:
 - a) What were some interactions or moments that happened this week that looked promising for your creativity as a group?
 - b) Were there notable instances when you might have felt frustrated or perceiving that there was some obstacle for the group?
 - c) Do you have any examples of times over the week that you felt you made progress?
 - d) Did anything happen that made you feel confused or unclear about how things were going to turn out?

Due to missed co-ordinations by the researcher with the projects' organizers resulting from a death in her family in March, the questionnaires were only used in the month of April. C4 participants only responded in the questionnaires for 1 week, and the questions did not elicit explicit interactions by name except for 1 week (a Dora interaction the week of April 11th).

For the week of April 20th, comments from both the Syracuse and Continuum groups such as the following prompted continual viewings of the entire session to discern which particular interaction was most indicative of the qualities cited:

- "Good brainstorming on point for a lot of our concepts." (Levenger)

- "...brainstorm bits of conversation seem the most helpful. Often the random thoughts seem the most interesting." (Levenger)
- "Building on ideas after they were presented – especially when people brought up their own personal experiences." (C4)
- "...starting to get each other's jokes. More riffing back and forth versus stilted us and you..." (C4)

These comments surprised me due to my prior assumption that the groups would be in refinement and improvement modes. After comparing and contrasting all of the presentations, I deduced that the interaction referenced involved Samantha's presentation. I thought the selection of only two creative interactions was insufficient to establish a comparative basis amongst interactions to notice conversational conditions and the facilitation of creative breakthroughs.

My choice to analyze the Bailey vignette of the last class before the presentation day in Boston was based on the responses to one of the final interview questions, "What comes to mind when I say, 'Moments where you all turned a train-wreck into a high-speed rail?'" and most people selected Bailey's last class session before the Distinctive Greetings presentation the week following. In additional comments participants made during the final interviews, about "the most breakthrough event," Bailey's last class session was also mentioned. In a discussion with Violet during the final interview, I asked her what she thought the best examples of creative moments in the Distinctive Greetings project were overall, and although she responded that "We had them on everyone, at different times on everyone's projects...[Bailey] didn't have the breakthrough until the second time she presented the

storyboard...[at] the very end...the last class..." Others expressed the Bailey interaction at the last class like the following:

- "They flipped her ideas into like the negative commentary rather than the positive. And they like went like quick. And I was watching Professor Robinson as that was happening and I was like, okay, let's see where this goes." (Dora)
- "It represented high risk for Bailey to take that direction. And so many times designers have this sort of inner feeling that we were asked by clients to create sort of niceness...it was a breakthrough [to take an edgier, 'not nice' approach] but Bailey is such a gutsy person which is why I love her as a collaborator. She took it and ran with it...a long way...I was really pleased with that." (Ned Robinson)

3. Digital audio-recordings of three telephonic, hour-long organizer interviews about the context and background of the Distinctive Greetings Project, and an initial trial of sharing a creative interaction (Dora) as my pilot project to ascertain whether this design would yield the layered meaning-making and traceable conditions for creative breakthrough. The organizer interviews were transcribed by a transcriptionist⁴³ and yielded 44 pages of data.
4. A group educational session facilitated by me after the final presentation of the designs to Distinctive Greetings on May 7th to deconstruct a creative interaction (the Samantha interaction was chosen) so that I could collect the group's interpretations of the conditions that helped and hindered creative breakthroughs. The Samantha interaction was depicted in a horizontal sequential map on a whiteboard with the excerpted essence of each turn on colored post-it note—orange for DS and turquoise for C4 participants. This

⁴³ Research staff confidentiality agreements were signed by the transcriptionists used for the interview data as well as by a research assistant who worked with me to help verify codes, make conversational maps and review transcripts for pseudonym usage.

had the dual purpose of providing a group interaction on the collective experience of the group. One facilitative and one troublesome vignette were planned to be debriefed at the group educational session, based on the information given in the weekly questionnaires. Yet, due to the smallness of the group and questionnaire responses to troublesome characteristics, in conjunction with my research sponsors, I chose to further protect participants' well-being. The troublesome situations were better generalized and captured into a thematic overview of "difficulties we have in presenting and critiquing for group discussion," which represented an IRB amended protocol. As I back-up to the planned video-recording of this session, I audio-recorded it. After the session I found that the video-recorder failed to audio-record. A 39-page transcript was made of this event from the back-up audio-recording; however, much is missing from this transcript due to poor audio quality.

5. The 90-minute individual final interviews were conducted via telephone with each participant as to the interpretations and meanings associated with a shared creative interaction as well as further thoughts and insights as to what was learned and noticed over the course of the project. These interviews were digitally recorded and transcribed into 290 pages of interview data.
6. I was present on May 7th in Boston during the C4 and Levenger students' final preparation of the presentations for Distinctive Greetings, and for the Final Presentation and Debrief with Joe Smith, the Collaboratory Manager of Distinctive Greetings. These two sessions were also meant to be videotaped but the video-recorder at C4 malfunctioned and my digital device did not capture most of these events. I did, however, take notes and have used those in my analysis.

7. Last, I received the final bound compilation of the Levenson students' projects finalized by Professor Robinson and Samantha during the fall of 2012.

Instruments used. This study's instruments were appropriate and consistent with the emergent nature of the creative process and the theoretical and methodological framework of social construction and CMM. They were designed to help the researcher determine if and what conversational conditions facilitate or hinder creative breakthroughs. The remaining four instruments were related to the four data collection events below:

- Anonymous Reflective Weekly Questionnaire (questions noted above in #2),
- Organizer Interview,
- Group Educational Session (below), and
- Final Individual Interviews (below).

The interviews had a component where the interviewee would examine a turn-by-turn interaction on a transcript of a creative vignette she or he would receive prior to the interview. The interview questions inquired further into the patterns of conversation, meanings, and management of those conversations from the selected vignette. As mentioned above in the discussion of research methods, the following is an example of how some of the interview protocols targeted background meaning per the analytical frameworks of CMM. In Table 3, the protocol question I used is presented in regular font, and the targeted conversational condition dimension is shown in italics:

Table 3

Protocol Question and Targeted Dimension of Conversational Conditions

| Group Educational Interview On Mapped Creative Vignette (Samantha) | |
|---|--|
| 1. | In “seeing” how this interchange is laid out now, what moments seemed most lively or promising? |
| a. | At any time during this interaction, did you learn something that you think helped you become more connected to each other? <i>Collaborative condition</i> |
| b. | At any point in this vignette was someone voicing the “group’s” wisdom/creativity? <i>Group creative emergence</i> |
| c. | Did anything happen that helped you consider something new, (or span a boundary)? <i>Range of Alternatives/Consequent conditions</i> |
| 2. | Did anything happen before those that seemed influential? <i>Antecedent conditions</i> |
| 3. | Any frustrating, unclear or confusing points that you can see? |
| a. | What seemed most important for Person X at that time? For you?/Others? <i>Hierarchy of stories or contextual shaper</i> |
| b. | Are there any points at which you would like to “do over”? |
| c. | Any times when you weren’t happy about the direction of things, and then it turned out ok? <i>Interruption in logical force</i> |
| 4. | Did anything from this interchange have “a life of its own” for the group? Tell me about that... <i>Logical force or upward spiral episode</i> |
| 5. | Are these patterns of interaction similar or not to the ones you’re used to? How? ... <i>Degree to which people depart/build from/add to...</i> |
| 6. | Anything you want to say about how seeing the conversational map and the meanings we have about it? |

Table 3 – Cont'd.

Final Interview

1. Since our Group Education Session, any insights about conversations and the process of creative collaboration? (*Note: This interview is at the end of the Distinctive Greetings Project so the respondent's frame of reference will be the recent past*). *Sought their insights*
2. In thinking about the map and the interpretations we uncovered, is there anything about that experience that verifies anything you already believed, contradicts something, or changes your mind? *Looking for "news of difference"*
3. What about this process was most significant to you? What, if anything, do you see yourself doing with this experience from here forward? *News of "who we are becoming in the process"*
4. As a result of our conversations, through the weekly questionnaires, and the Group Education Session, did you experience any changes besides what you have already shared with me? *More on who you are becoming...(did this make a difference?)*
 - a. How do you consider those changes? Positive, negative, neutral?
 - b. Any change that was significant for you?
 - c. What contributed to that significant change?
5. Do you have any other feedback about this process? Your observations, positive and negative, are extremely valuable to this research and to me.

Review of Dialogue Interaction from Recorded Data (that they reviewed during the interview which I had sent prior)

1. In recalling this interaction, describe what you think was really going on? *Background meaning seeking*
2. When you said _____, what did you mean? *Background meaning to specific turns*
3. When ___ happened in the conversation, was there anything you felt you couldn't say but wanted to? *LUUUUTT*
4. When that moment in the interaction occurred, what seemed the most important to you? And what would you speculate was the most important to the other people involved? *Hierarchy of Contexts/Stories acting from and into*
5. What thoughts (associations, prompted you to say (or do) this next thing? *What dimensions of social force are at work? Bifurcation points?*
6. What feedback was the most helpful in your accomplishing what you wanted with your design? *Influence of feedback/group/etc.*

Reflection on the Distinctive Greetings Project

7. What about this process of the Distinctive Greetings Project was most significant to you? *What they see as important*
 8. What did you learn over the course of the Project?
 1. Did this experience verify anything you already believed, contradict something, or change your mind?
 9. Is there anything that you wish was *done differently?* *Possible indication of logical forces, bifurcation point, meaning made in the background*
 10. Any major disappointments or things you think were failures that didn't get learned from (yet)?
 11. What were the best examples of creative moments overall? *Eliciting creative BT...I also come out and directly asked the question, "what were the creative breakthroughs" in a couple of interviews when this wasn't clear enough.*
 12. What comes to mind when I say, "moments where you all turned a train-wreck into high-speed rail"? *Another attempt at getting at creative breakthroughs*
 13. What successes do you see from this Project?
-

The group interactional conditions per creative vignette (e.g., the Dora, Bailey, and Samantha interactions) were more evident from a holistic, within-episode overview that I made to assess the group climate or mood and answer a more general question, “What is going on here?” These conditions were further amplified by the data from the organizer, group, and final interviews.

The specific conversational conditions were evident from the elements that make up the episode pattern: the turn-by-turn speech acts, the emergent meaning from what was said and done in sequence, interpretations of what influenced such acts (taken from the interview data), and what impact particular episodes had on the emergent pattern. Both sets of conditions can be thought of as the contextual resources that shape actions and meanings and are explained as “stories, images, symbols, and institutions that persons use to make their world meaningful” (W. B. Pearce, 1994, p. 23). Conversational conditions are a contextual phenomenon, and the use of these instruments allowed the participants and the researcher to explicate the multiple contextual shapers of various conversations and distinguish the various stories that the participants might use to enact creative breakthroughs and creative and collaborative choices while engaged in discourse.

Pearce’s explanation of resources (1994) aligns with Burr’s (2003) conception of discourse, and my design of the instrument interview and questionnaire questions aligned with discourse and conversational analysis (H. Sacks et al., 1974), as they are focused on particular meaning and actions within conversations and interactions:

A discourse refers to a set of meaning, metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of events...there may be a variety of different discourses, each with a different story to tell about the object in question. (Burr, 2003, p. 64)

Data Management

Procedures used for the protection of participants and of data. In addition to minimizing the risks to the participants in the procedures and choices I have explained above, I collected all of the email correspondence, instruments related to this study, transcripts, notes, compilations of aggregated data from the instruments used, MP3 digital audio files, and reports from Levenger University in my password protected laptop computer in labeled electronic files coded with the category of content and name and in files in my locked home-office. In a locked safe within my home, I made and secured a separate master contact list of the participants, email addresses, name choices, and final report requests.

The informed consents sought specific permission for each of the two types of recording used for this study: the Adobe Connect video and audio recording and digital audio recording. The videotaped material is accessible on a secure server maintained by Levenger University. Only the IT manager and myself have my account number, and only I have my password to access the account and gain access to viewing the material. I used two professional transcriptionist services and one research assistant and obtained signed confidentiality agreements from each provider about maintaining strict confidentiality of the participants. I used pseudonyms for any quotes that had the potential to be included in the final research report.

Procedures of secure data collection and maintenance. My promise to the participants and the two university IRBs were that all data would be kept for three years after the research is complete, and then destroyed by:

- computer erasure and deletion of all electronic files and contact information;

- digital recorder erasure and deletion of all digital files of interviews and recorded sessions;
- hard-copy documents of transcripts that have been printed out for data coding, organization and analysis, poster-sized post-its for thematic understanding, and notes taken from interviews, digital recordings, or Adobe Connect video-recordings will be cross-cut shredded; and
- any Adobe Connect password notations erased or shredded.

Data Analysis Processes

To ensure that I was faithful to the context, my data analysis process included (a) a review of the majority of the data set in terms of viewing most of the videotaped class sessions and relistening to the audiotaped interviews; (b) a first phase of data analysis, which included conversational analysis and the first two steps of CMM research methodology; (c) a second layer of analysis according to CMM, steps three through seven; and (d) a third layer of analysis of the use of figurative language as I have defined the parameters of that for this study in Chapter 1.

My data analysis process followed the general qualitative research understanding: the preparation of text data (or image data) for analysis, the reduction of data into themes through a system of coding (and a reduction of the codes), and finally, a representation of the data in a discussion, figures, or tables (Creswell, 2007). An overview visual of the data analysis and synthesis process is visible in Figure 2 below, and each major step is further described following the visual presentation of it.

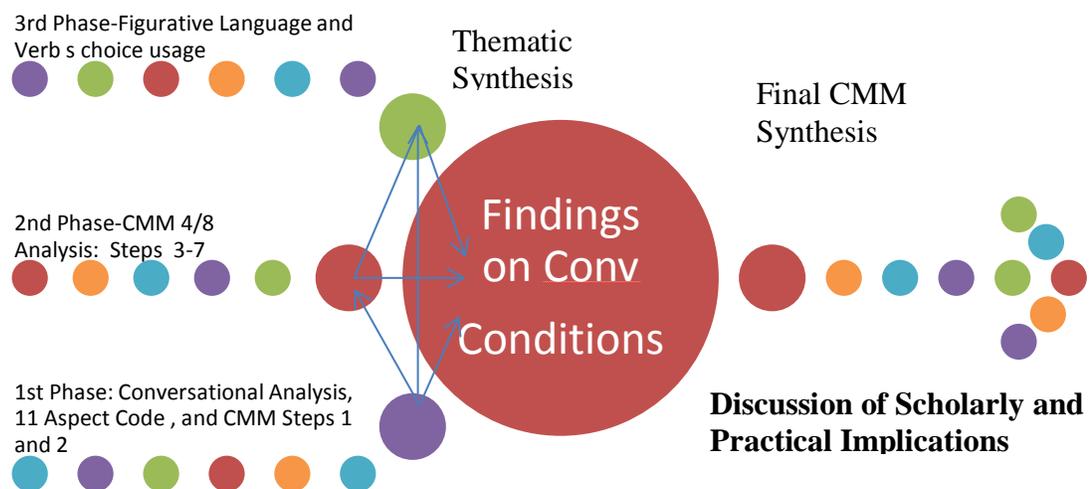


Figure 2: Overview visual of data analysis and synthesis process of Distinctive Greetings Project.

The answers to the research questions relied primarily on the data obtained from the data collection and recursive data analysis of those three creative vignettes taken from the videotaped sessions between the design students and design professionals on three separate design projects for Distinctive Greetings. All of the other data sources used in this study were related to those primary sources. The data were analyzed through recursive steps of preliminary, first-level and second-level analyses for themes, then thematically synthesized and analyzed again from a CMM stance to arrive at findings.

First Phase of Data Analysis: A Recursive and Reiterative Process of Conversational Analysis and CMM Descriptive Steps

Although the participants identified the Dora, Samantha, and Bailey interactions as promising for creativity, they did not specifically identify the most creative moments. The challenge in this phase came from the recursive processes of transcription, rereading, cross-checking between data events, and rudimentary coding needed to demonstrate that each of

the three participant-indicated creative vignettes were in some way illustrative of creative breakthroughs in collaborative workgroups. There was no predetermined number of subepisodes for analysis set. This phase was the most lengthy and time-consuming, given that each creative vignette took at least 35 hr to transcribe according to paralinguistic coding features consistent with conversational analysis practice (Buttny & Jensen, 2002; H. Sacks et al., 1974; Trenholm & Jensen, 2013).

The major steps in this first analysis phase were the (a) absorption and preparation of the data in three sub-steps: observe, listen, read, and transcribe video and audio-taped events to text—both in a CA document and a CMM serpentine conversational map, take impressionistic notes, and aggregate and organize the data into one document where appropriate; (b) preliminary coding of data for contextual and interpersonal interaction aspects that could indicate creative breakthroughs and shifts or changes in the conversational conditions; and (c) listing preliminary themes.

Coding began with the painstaking CA paralinguistic feature coding of the body movements and tonalities, cadences, etc. described above, and the textual elements of the speaker within each turn. These were also synchronized with displayed body movements and moods of the participants in both locations. Technology aspects were also noted, as the visual display of the design concepts were a part of the conversation. The conversational layout and coding scheme looked like Figure 3, and individual conversational analysis coded transcripts of each of the three creative vignettes chosen (Dora, Samantha, and Bailey) are attached as Appendices T1-T3, respectively. This kind of layout isolated the particular constitutive conversational turns and possible conditions that can be seen as part of conversational

practice for group interaction (Buttny & Jensen, 2002; H. Sacks et al., 1974; Trenholm & Jensen, 2013).

| | |
|---------------------|--|
| Word in bold | Word said with increased emphasis |
| PAUSE | Brief, untimed pause |
| () | Transcriptionist doubt |
| : | Extended or stretched sound, syllable or word |
| . | Falling vocal pitch |
| .+ | Voice trails off |
| ? | Rising vocal pitch |
| , | Continuing intonation with slight downward contour |
| ^ | Rising intonation |
| ∨ | Falling intonation |
| = | Latching of contiguous utterances |
| [] | Speech overlap |
| SILENCE | Longer silence than a brief, untimed pause |
| ~ | Audible out-breaths |
| Hhh | Possible laughter |

The speaking was organized into three-column, several row Word documents that incorporated the notations and looked like this:

| Turn | Language Content | Other Communication |
|--|---|--|
| # | (The Said) | (The Said in the Surround: Non-verbal, paralinguistic [voice tones, gestures], energy, pacing, silences, pauses, etc.) |
| + | | |
| Tech Difficulty | | |
| 1 | Dr: (trying to get the storyboard up on the screen so C4 can see it...speaking while she is doing that) ::Just looking at the phone section of the storyboard PAUSE This phone answering/recording device I buy at the store and then come home first and give it a sample conversation so it can pick up on my voice, common topics and words that are used frequently. I want to share my place with my brother which is a café near the university, as he does with me his place while we are on the phone as the device has 2 aspects: an interactive interface and a database, as well as an answering machine program: the last part of set up is to upload a picture of my space and he uploads a picture of his classroom which has legos, a sandwich and other things... | (Violet squinting her eyes, straining to see, eating lunch), T focused on screen/hand on mouth |
| -Can't see the mouse points | | |
| -Outside noises interrupting | | |
| -Camera | | Throughout Dr. speaking, T & V still eating – V intently watching the screen |
| Guy angling shots throughout this presentation | | |

Figure 3: Example of Conversational Analysis coding legend and partial transcript.
Note: This transcription system is a simplified and modified version adapted from Buttny and Jensen (2002), “Hot Stove League Talk” in Gary Gumpert and Susan J. Drucker (Eds.), Take

Me Out to the Ballgame: Communicating Baseball. Cresskill, NJ: Hampton Press; 71-93. Reprinted with permission, as shown in the partial example, in Figure 3.

Each of the three vignettes and the interviews were also coded (turn by turn, each response) by an 11-feature coding matrix that I termed the “Meaningful Association Matrix” based on the previous literatures. I utilized the major decision rules of CMM when looking for disjunctions as clues to signify within episode structural and interpersonal changes. The 11 features are shown in Table 4, and the number association for each feature was assigned to the presenter and speakers as well as the listeners in each turn.

Table 4

Meaningful Association Matrix

| Descriptors | DS | C4 |
|---|----|----|
| 1) Kinds of speech acts/episodes | | |
| 2) Connection in conversation | | |
| 3) Mood | | |
| 4) Quality of listening | | |
| 5) Nature of questions & critique | | |
| 6) Ideas: Flow or slow | | |
| 7) Anything missing or in the way? | | |
| 8) Presence of mutual builds | | |
| 9) Anomaly; disjunctive; or surprising expressions or scenes | | |
| 10) A summary statement that seems to categories or name interaction | | |
| 11) Distinguishers for creative breakthroughs indicated by participants | | |

The overall context and instructions on how to read the CA transcript and look for disjunctures and code were explained to a research assistant. We each coded the vignettes and interviewee's responses separately. We then compared the numbers we assigned to each utterance and turn. Where we disagreed, I reread, reviewed videotape, or relistened to audio recorded interviews and made the final coding number decision.

For each vignette, I shortened the speaker's comment to its essence and made a conversational map according to the CMM serpentine heuristic. I used the implied logical rules about how to group and emplot the subepisodes, given this study design did not allow for participant consultation. The initial CA coding helped me determine how to emplot the CMM serpentine map for each creative vignette.

My decision rules for emplotment came from three sources. In following conversational analysis, the practice is that each utterance is assigned a turn, and I followed that practice except where it made sense to keep the utterances of one speaker within one turn, usually when the participants were talking over one another or making vocalizations in a flow. In CMM practice, subepisodes are usually constructed in consultation with participants, and where that is not possible, Pearce (2007) advised to look for naturally occurring disjunctures or shifts, with attention to conversational triplets or pairs. Therefore, I used disjunctures observed in the videotape in terms of mood, body, and tonality changes as well as textual content shifts to emplot the conversational maps of each creative vignette. Finally, in cases where I was not sure how to emplot the episodes, I consulted with Arthur D. Jensen (Buttny & Jensen, 2002) by telephone, who was familiar with both conversational analysis and CMM practice. Below is an example of such a conversational map of a su-

episode from the Dora vignette, where the breakthrough occurred between turns 12 and 13 between Violet and Dora. The student is represented by a square shape, C4 participants by an oval, and Professor Robinson by a hexagonal shape. The full analogy that Violet made is not completely visible in this map, so I would need to check between the CA transcript and the CMM conversational map for the full effect. But it is more clear from this simple conversational map that Professor Robinson, C4, and Rick deepen the meaning of Dora's design concept, as you will notice a slight build after Dora's response (four comments from four participants). These maps were invaluable for a visual comprehension of the structure and sequential context of conversations.

TURNS 12-16: ACCEPT, ADD, SUMMARIZE, BUILD (OPENING FOR NEW ACTION & MEANING)

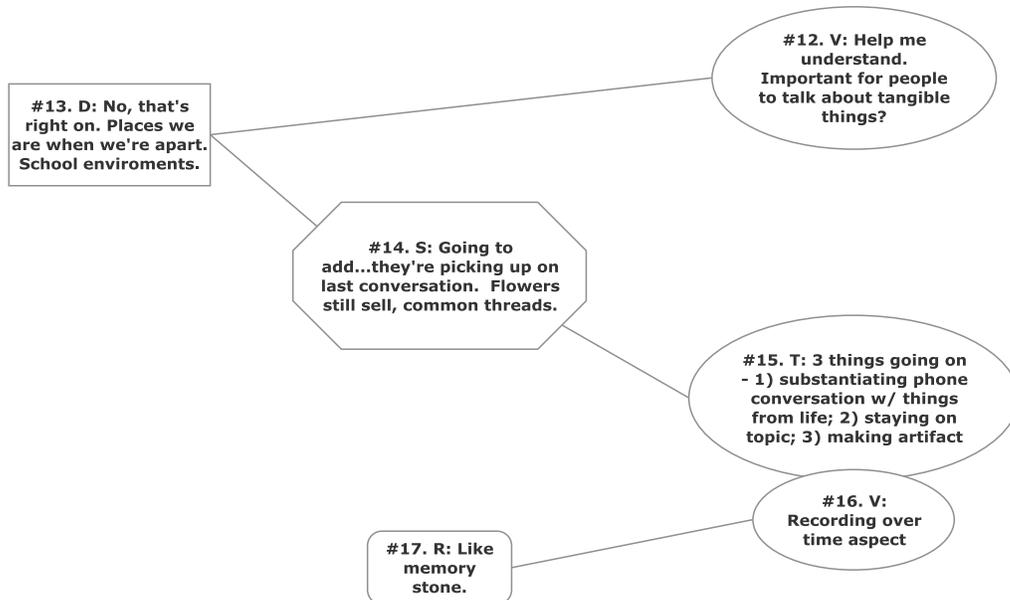


Figure 4. Dora's CMM simple conversational map.

To develop preliminary themes, I created working documents entitled “[Initial] Conversational Map and Comments” that aggregated the employed vignette, the separate analyses of the kind of speech acts and episodes, the 11 features, a description of the subepisodes and turn numbers, and all the comments from the organizer and final interviews that were associated with that particular vignette.

Finally, the last step in the First Data Analysis Phase was a list of the preliminary themes from the steps above, bracketed to be checked later after the Levels 1 and 2 were complete. Similarities and differences between and amongst the creative vignettes were noted in this preliminary phase, as well as some features of creative breakthrough conversation from the nature of conversation in creative endeavor. Last, I noticed some expressions and themes that shed further light on what aids creativity as well as collaborative process.

Table 5

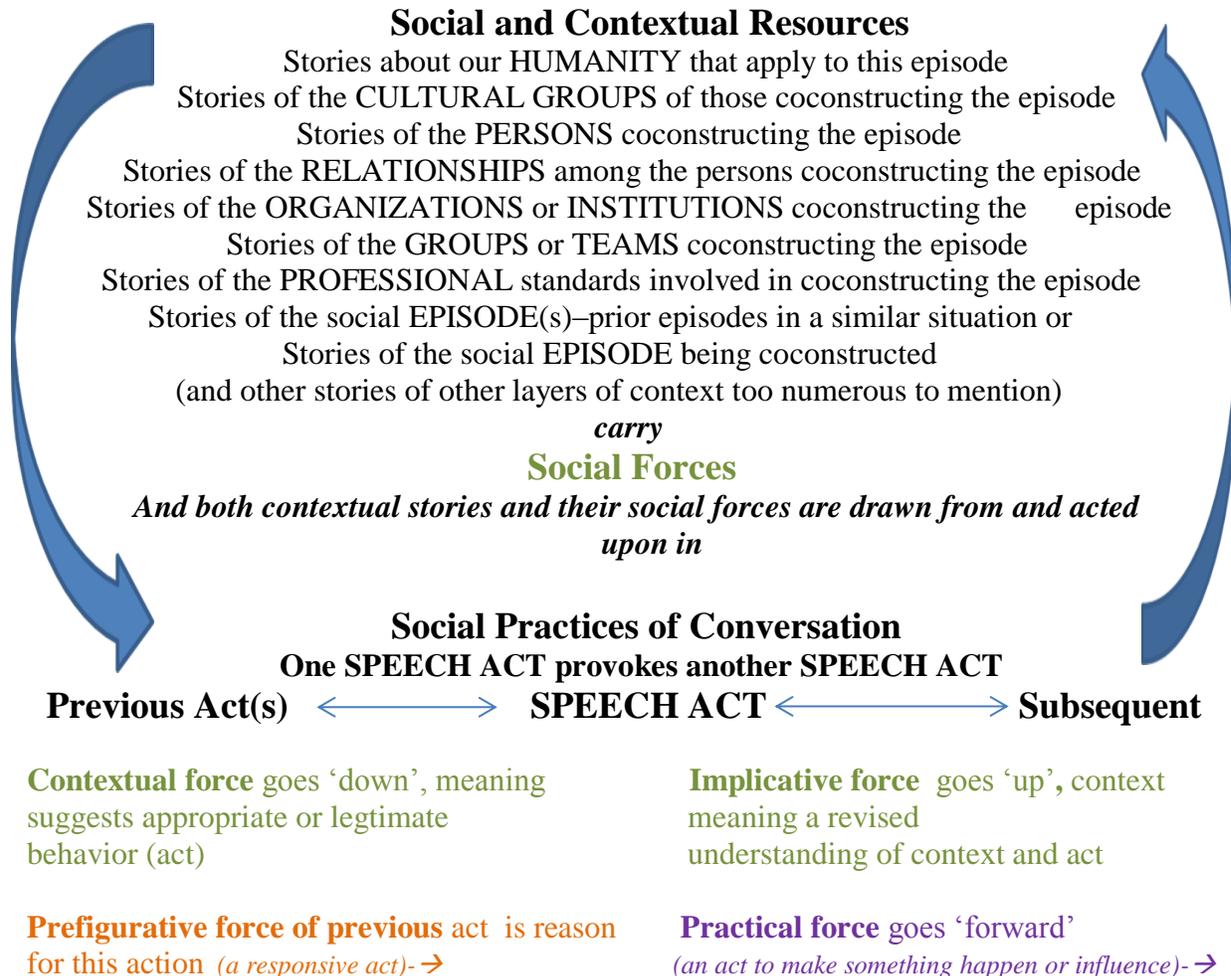
Preliminary Analysis Phase and Placeholder Theme Process Per Data Event

| Data Sources | | | | | | | | |
|--|---------------------------|--------------------------|--|--|--------------------------------------|--|---|--|
| | Videotaped Session | Anonymous Questionnaires | Organizer Interviews (2 Skype and 1 Phone Interview) | In-Person Preparation Session Before Hallmark Presentation | Presentation of Projects to Hallmark | Group Educ. Session (Grp Interview) Assoc w/Vignette | Final Interviews (10; both Skype and phone) | Hallmark Project on Collaboration published by Syracuse Collab |
| Levels of Analysis, First Phase. (P1) Absorption and Preparation of Data | | | | | | | | |
| Observe/Listen/Read | xxx | xxx | Xxx | X | x | xxx | xxx | xx |
| Researcher Notes | x | x | X | X | x | x | x | |
| Transcription to Text of video and audio taped events | Xxx (only on 3 vignettes) | n/a | Hired; Text only | Not captured | Not captured | Hired; Text only | Hired; Text only | n/a |
| Aggregation of responses into one document per data event | n/a | xxx | Xx | n/a | n/a | x | X per interview | n/a |
| (P2) Preliminary Coding for Contextual and Interpersonal Interactional Aspects | | | | | | | | |
| Transcription per Conversational Analysis | xxx | n/a | Text only | n/a | n/a | Text only | Text only | n/a |
| Flagged person mention | n/a | xxx | Xx | n/a | n/a | x | xxx | n/a |
| Noted presence or absence of any of 11 features | xx (checked coding) | n/a | n/a | n/a | n/a | Disjunctures or Surprises only | Xx (checked coding) | n/a |
| Serpentine of Vignette | Xxx (per vignette) | n/a | n/a | n/a | n/a | Xxx (with group comments) | n/a | n/a |
| Aggregated doc made per creative vignette: comments & 11 features above | xxx | n/a | Cross referenced | n/a | n/a | n/a | Cross referenced | Cross referenced |
| (P3) Preliminary Themes Per Creative Event and Group Sessions | | | | | | | | |

Legend: x=1-3x; xx=<3x; xxx=<5x. "Hired" = hired a transcriptionist, otherwise, I did the transcription myself. "Not captured" means that the recording device did not work. Cross referenced means that these data were cross reference with the conversational analysis transcripts. Checked coding means that each turn was coded independently per the 11 feature Matrix 3.1 by two coders, myself and a research assistant after training on what the codes meant and what would be included and excluded for each, and then each final interview transcript and videotaped transcript was checked for agreement. When no agreement occurred, then a discussion, a re-listen and a final code was assigned by the researcher.

Second Phase of Analysis

CMM analysis was designed to discern how participants made meaning, changed meaning, or created new meaning by how they coordinated their actions and narrated their experience. A graphic depiction of how this occurred is in the CMM Flexible Hierarchy Model (Figure 5), which shows how the social practices of conversation draw upon and then reflectively continue to create socio-cultural contextual resources. Not all of the social and contextual resources listed here are drawn upon, there may be many more not listed that are drawn upon, and they are not necessarily in the order here, hence the name “flexible.”



*Figure 5. CMM flexible hierarchy model showing social practices, resources, and forces. Adapted from “Modeling Communication” by Arthur Jensen, Diane Grimes, and W. Barnett Pearce, 2003, in Diane Grimes (Ed.), *The Art of Making Better Social Worlds: Communication in the Globally Diverse World, an Unpublished Manuscript*, pp.119-132. Copyright 2003 Diane Grimes and Arthur Jensen, reprinted with permission from Arthur Jensen.*

Earlier in this chapter, I explained how the CMM concepts and heuristic tools formed the bases for the research design and analysis. Here, I briefly describe how I used the CMM research methodology to see patterns within each creative vignette subepisode analyzed.

The second phase of analysis upon the text was to follow the four-function-eight step CMM research methodology, specifically Steps 3 through 7. Performing Steps 3 through 7 was not

a linear process as it reads in text. The process was recursive and reiterative with the theoretical concerns of CMM, the various data sources, and the grammars used within each creative vignette.

CMM research methodology proceeded through four cumulative goals (or functions)—description, interpretation, critical assessment, and practical application—on the basis of immanent criteria within the communication moments or episodes themselves to answer the general questions, “What is being made? How is it being made? Who are we/they becoming in the process? How could we/they make better social worlds?” (Pearce, 2006, pp. 9-10). These questions gave me a way to see the meaning-imbued patterns and how these conversational patterns reflexively made or created the social world and influence what is created in that social world, namely the creative moments and their attendant relational processes enacted in a collaborative environment. The majority of my analysis uses the CMM essential questions from the researcher’s perspective, as indicated in the following table. In this particular case, my questions map on to the traditional CMM theoretical framework like this:

Table 6

Critical and Practical Concerns of a CMM Analysis

| CMM Communication Perspective Essential Questions | Creative Collaboration as a Constitutive Accomplishment: Essential Research Question(s) |
|--|--|
| 1. What is being made? (Or what are we making?) | What are they making? What are the promising and troubling moments for creativity (Questionnaires)? What conversational conditions are associated with creative breakthroughs in collaborative workgroups (Some aspects of the 11 features from Matrix 3.1)? (Description of them). |
| 2. How are we making it? | How are they making it? What do people say and do that facilitate creative acts and creative episodes? Who said what, when? How might that utterance provoke the next turn? What seems ‘frustrating’? What seems ‘playful/’building/new’? What obvious shifts in body/ tone? What kind of talk slows or stops idea flow? Who’s doing what in the room? What patterns emerge? (Description and interpretations of the sayings and doings). |
| 3. Who are we becoming in the process? | Who are they becoming in the process? |
| 4. How can we make better social worlds? | In what ways could they create better creative collaboration or creative breakthroughs by design? What are they doing that works for creative breakthrough, for ease in the conversational flow? (What conversational conditions facilitate creative breakthroughs in collaborative workgroups? Implications for practice and for theoretical development?) |

Table 7 shows the four functions and eight steps of CMM methodology that I followed. CMM research methodology and procedures for data analysis constituted the answer to the research problem from a microdiscourse focus on conversation and interaction as a subset of discourse analysis (Burr, 2003; Schutt, 2008), or a specific conversational condition aspect because those conditions can be shown to exist and can be replicated. I found that the heuristic models of the serpentine, social force, hierarchy of contexts,⁴⁴ and the LUUUUTT were the most useful CMM analytic frameworks in this study. The steps are consistent with other qualitative and thematic analysis schemes (Braun & Clarke, 2006) as well as social construction treatment (Burr, 2003; Denzin, 2000). The steps, functions, and how the analysis was done in this eight-step-four function model are described in more detail within Table 7.

⁴⁴ The hierarchy of contexts is also called the hierarchy of stories by CMM researchers. Therefore, I use these terms interchangeably.

Table 7

CMM Eight Research Steps in Four Functions

| Research Steps | Research Functions (Goals) | CMM – The communication perspective |
|---|----------------------------|--|
| 1. Describe context & sequence of actions <ul style="list-style-type: none"> • What are the conversations under study? • What are the particular things actually being said by whom, to whom, and in what order? • What is getting made out of those utterances and what does that mean, to whom, and what other implications are there? | Description | <ul style="list-style-type: none"> • Frame the conversational segment in terms of coordinating action (patterns) and the meaning that is getting made (stories) • Set out the particular language acts by particular actors in specific contexts |
| 2. Punctuate the sequences: Note disjuncture/discontinuities/incongruities | Interpretation | <ul style="list-style-type: none"> • Map triplets, episodes, multiplicity and layering of stories. • Map out the hierarchy of contexts and relevant aspects of the LUUUUTT model |
| 3. Describe Dimensions of Storytelling: Note the stories lived/told/manner of storytelling | Interpretation | <ul style="list-style-type: none"> • Move from 3rd to 2nd person • Loops • Logical Force |
| 4. Thick Description: Do a 'thick description' of the conversation(s) | Interpretation | <ul style="list-style-type: none"> • Merge description and interpretation |
| 5. Name and Describe Events in Conceptually Ladened Way: Note tensions between stories lived and told to name and describe the events being studied | Critical Assessment | <ul style="list-style-type: none"> • Reiteratively asking questions that note the various perspectives in Steps 5-7 as circular processes of co-evolvments between coordinating actions and meaning. |
| 6. Deeply Understand Patterns and Different Patterns of Action Note untold, unheard, etc. Stories so as to understand different patterns of action. | Critical Assessment | |

Table 7 – Cont'd.

| Research Steps | Research Functions (Goals) | CMM – The communication perspective |
|---|---|--|
| 7. Assessment of Action: Note bifurcation points, missed opportunities, skillful action. (An assessment of action, if done differently, different things would have been made). | Critical Assessment | |
| 8. Report/Act/Reflect <ul style="list-style-type: none"> Do something with the research that makes a difference. Make a knowledge claims that will meet the community standards for good argument or 'proof' How could this improve the world of practice? | Practical Application <ul style="list-style-type: none"> Making knowledge claims with the discussion of findings that adds/refutes to particular theory in relevant fields of knowledge Delimited knowledge claims Implications for further research & knowledge and practical application | <ul style="list-style-type: none"> Write a research report that addresses the three bullets to the left. As a practitioner, rinse for particular client, apply and repeat. |

Table 7 is based on Pearce, 2006.

Description. As a part of the description purpose in Steps 1 and 2, my goal was to provide a preliminary description of what occurred in a specific interaction with the particular turn-by-turn sequences of what was actually said and done in the interaction. I then added the hierarchy of contexts or stories I discerned from the associated interview data or what made sense from the episode sequences. These stories were spirally linked to turns from what emerged from the other data sources. This was part of “doing a hermeneutic analysis” (Pearce, 2006, p. 10) prior to performing any interpretation or critical assessment.

As described above in Phase 1, I used the serpentine heuristic and paid careful attention to employment of the subepisodes of each vignette, specifically the nonverbal and paralinguistic doings of tonality, pacing, spacing, laughter, silences, over-talking and the like to provide rich description and postpone interpretation. By noting the triplets and episodes as well as possible shifts in meaning and action, creative breakthroughs or breakdowns were more discernible. Pearce (2006) noted that nonverbal content could be more important than verbal content, and the notations of it could aid in triangulation of data. The LUUUUTT and the hierarchy of contexts helped me further understand how the background influenced what was said. By noticing where the participant placed her or his attention to whom or what else the speaker might be addressing with a particular turn, I discerned what aspect of creative or collaborative behavior was helpful or hindering to creative breakthroughs.

Interpretation. The interpretation goal focused my attention on what meaning and what management of meaning was associated with the turn-by-turn sequencing of conversational actions. At the first level of interpretation, it was important to punctuate the sequences of actions by observing the disjunctures and discontinuities between each turn and groups of turns (triplets, or pattern of triplets) as well as between the tone of voice and phrases and words used (a disjuncture between context and content). By noting the disjunctures, I could then draw upon the appropriate CMM models or heuristics (e.g., the hierarchy of contexts, social force, LUUUUTT) that could help me explain the textures of discomfiture.

In order to better understand the particular grammar of the conversational interaction, the situation,⁴⁵ and the stories that might have influenced the participant's action, I mapped

⁴⁵ Pearce uses the notion of grammar from Wittgenstein (Wittgenstein, 2009) to illuminate a structure of meaning and action (Pearce, 2006, p.13).

out the hierarchy and LUUUUTT models and filled them in according to the associated episode and turns. I would make inferences from “the word choice, gestures, facial expressions, tone and quality of voice, bodily movements” and pacing (Pearce, 2006, p. 13), in addition to actually using what participants said from their interviews that may have been associated with the particular turn and episode. I used the questions and heuristic frameworks of Table 8 to help me discern the relationships between the actions participants took and the meaning made (or acted from).

Table 8

Heuristics and Characteristic Questions of CMM Research

| | Coordination of Action | Making and Managing Meaning (Coherence) |
|------------|--|--|
| Questions | <ul style="list-style-type: none"> • What is the pattern? Is it robust? How is it sustained? • How could we describe this pattern (unusual, fragile, beautiful, valuable)? How is it achieved? • What are the moves here that have power, or demonstrate skillful play? Why are they so (powerful, skillful)? • What affinities can we discern from these people with this particular pattern? How does it show up? Why? | <ul style="list-style-type: none"> • What are the stories here? Which one is operating at that moment? How told? In what contexts? When? To whom? • What are the relationships amongst the stories? Hierarchy? Nested? Loops? • With what logical forces? |
| Heuristics | <ul style="list-style-type: none"> • Conversational triplet • Episodes • Serpentine Model | <ul style="list-style-type: none"> • Contextual hierarchy model- ('hierarchy') • Stories Lived, Stories Told, Storytelling (Unheard, Untold, Unknown, Untellable Stories)- LUUUUTT • Daisy (stories nested) • Strange or Charmed Loops • Logical Forces • (Prefigurative, Contextual, Implicative, Practical) • Communication pattern afterlife • Bifurcation points |

Note: Table 8 is based on Pearce, 2006, p. 9.

The model of social force (also called logical force) helped me locate how participants engaged in a conversational pattern of shifting their creative focus from something they thought or had grown accustomed to thinking would work as a design concept, to something that was of breakthrough character, whether in the design itself, in relationship, or in communication. Shifts could be discerned when the energy or relationship to what “ought” to be done relaxed, and a new perspective emerged, as the evidence in Chapter 4 will make more clear. While the stronger presence of a pattern of practical and implicative forces in a situation are not a recipe for breakthrough, I used the model of logical force to notice when they were stronger than a pattern of contextual and prefigurative forces, and when people had new openings for action, saw something old in new ways, or completely changed direction from what could have been predicted. As seen in the depiction in Figure 6, implicative force moves “up” and has the potential to create a new reality by shifting context, and practical force moves “forward.”

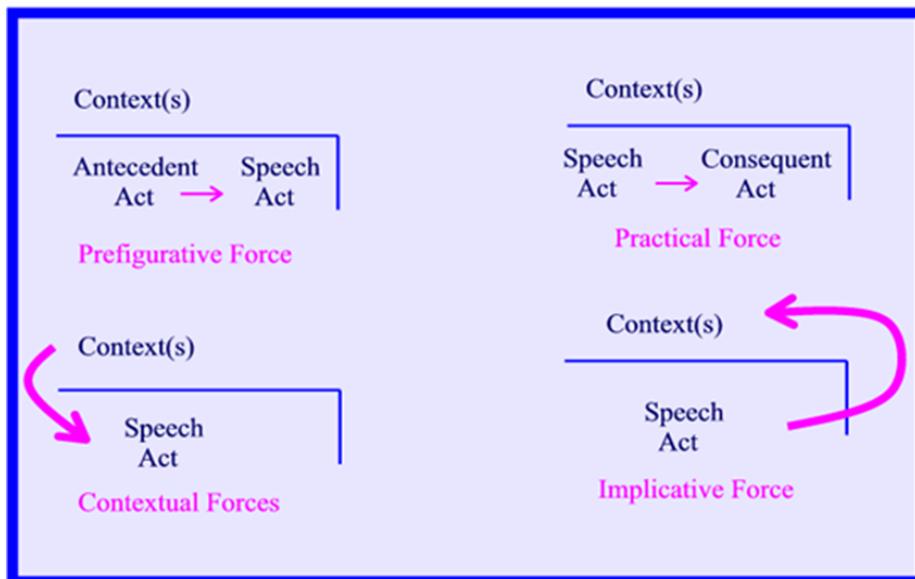


Figure 6. Depiction of social force influence on meaning (context) and action. From “Modeling Communication” by Arthur Jensen, Diane Grimes, and W. Barnett Pearce, 2003, in Diane Grimes (Ed.), *The Art of Making Better Social Worlds: Communication in the Globally Diverse World, an Unpublished Manuscript*, p. 130. Copyright 2003 Diane Grimes and Arthur Jensen, reprinted with permission from Arthur Jensen.

Critical assessment. Pearce says, “[CMM’s] critical edge comes from the thick description of what is being made and how it is being made” (Pearce, 2006, p. 14). To produce the thick CMM description, I moved from the specific to the general with each subepisode, and utilized a number of inquiry tools, such as the following terms and heuristics per methodology used for analysis in Table 9. I used my research question as a positive variant on, “How are they producing unwanted episodes?” below in that I was interested in how they produced wanted episodes.

Table 9

Terms and Heuristics per Methodological Aspect Used for Analysis

| Methodology | Term | Explanation |
|-------------------------|---|---|
| Conversational Analysis | Coding System | Words emphasized; Pauses; Transcriptionist doubt; Extended or stretched sounds, syllables or words; Falling vocal sounds—pitch, voice trails off, intonations; Rising sounds—pitch, intonations; Continuing intonation with slight downward contour; Latching of contiguous utterances; Speech overlap; Silence (long than a brief pause); Audible out-breaths; Laughter |
| | Turn | What is said or done by one speaker in relation to another: Utterances, body movements, and vocalizations. |
| CMM | Act, Speech (W.B. Pearce, 2007) | A speech act is what we say or do for a specific message and response. The name CMM gives to the moment wherein an utterance occurs as coordination of a doing as well as the instance of making meaning in context(s) with another. |
| | Dialogical Activity (Shotter, 1997a, 1997b) | Two or more individuals who are engaged in joint action, which is constituted by actual lived utterances, which form situations in various ways. What we say and do is an acting out of contexts (before <i>this</i> action) and acting into contexts (those that are brought forth from <i>this</i> action, as one consequence). Our ‘inner-lives’ are created from our joint activity and engagement with larger social and spoken forms of life. |
| | Bifurcation Points (W. B. Pearce, 2007) | Critical and creative moments of <i>choice</i> in conversational episodes that are fateful: For the direction and implications of the current conversation as well as for the contextual interpretations made for future episodes and the action consequences of future episodes. The ability to discern and see bifurcation points enables persons to act wisely into the next moment. Parallel to the concept of turning points. |
| | Communication Rules | As an expression of deontic logic, socially constructed “oughts” and “ought nots” that govern behavior and guide the making of meaning. |

Table 9 – Cont'd.

| Methodology | Term | Explanation |
|-------------|--|---|
| CMM | Regulative | A regulative rule is a socially construction prescription that translate into a felt obligation to perform or not perform a particular act within a given context. |
| | Constitutive (Darrin Murray, 2012) | A constitutive rule is what communicators know about how to interpret messages and make meaning from others' communicative acts" (D. Murray, 2014, p. 17). |
| | Conversations (W. B. Pearce, 1994, p.162) | "From a third-person perspective, conversations are game-like patterns of social interaction comprised of sequences of acts, each of which evokes and responds to the acts of other persons." |
| | Daisy Model (W. B. Pearce, 2007) | A model of an event (e.g., speech act or episode) or object of the social world (e.g., story, identity, pattern, etc.) that assumes such event or object is the nexus of many conversations, depicted as a petal of the daisy. |
| | Deontic Logic (W. B. Pearce, 2007) | A moralistic sense of obligation referenced from socially constructed frameworks about how one 'should, must, ought to, permitted to, prohibited from' acting in any given situation or episode. The presence of deontic logics gives an experience of oughtness. These kind of logics also have implications for what is discouraged, considered irrelevant or acceptable. |
| | Episodes (W. B. Pearce, 1994, 2007) | In a temporal sense, people organize, perceive, and describe the constant stream of acts and human behavior that they experience into sequential 'chunks', or episodes--smaller and more manageable parts of their experience of their social worlds. Episodes are either self-named, or socially named narrative events, comprised of conversational turns. The beginning and ending of episodes are <i>imposed</i> by either the participants within them, or others according to how they are making meaning. Our social world is comprised of clusters or constellations of episodes. |

Table 9 – Cont'd.

| Methodology | Term | Explanation |
|-------------|--|---|
| CMM | Frame (G. Bateson, 1972, 1978; W. B. Pearce, 1994) | A form of social punctuation that serves to organize and differentiate actions within an episode from actions outside of the episode, and the partial meaning of the actions within the episode are derived from the frame itself. A frame is an interpretative meta-communication, as in the monkeys at the zoo biting each other was a form of play because they could signal each other that this is 'play', not combat (Bateson, 1972, p. 179). The subject of the discourse is interpreted from the frame itself and can be about the activity, such as 'play', 'conflict', 'debate', 'critique', or about the relationship amongst the speakers, or both. The <i>name</i> of an episode is a meta-communication. Persons' ability to meta-communicate infers that we can have multiple layers of meaning within each episode. |
| | Hierarchy of Meaning Model aka: Hierarchy of Contexts/Hierarchy of Stories (V. E. Cronen, 2004; W. B. Pearce, 2007; Trenholm & Jensen, 2013) | <p>The hierarchy of meanings model assumes that every speech act is surrounded by a multilayered system of various multiple contexts – there is not one order or completely named system of contexts. Contexts are social resources that are drawn upon that help organize persons' speech acts could be from our humanity as a human species, culture, identity/personhood, relationships (as couples, groups, organizations), episodes, etc.</p> <p>Layers of context are influential in the making of meaning and communication patterns; the hierarchy of contexts or stories organizes a person's dialogic abilities of acting into the moment, one higher context (or most important in the moment) story or context offers more grammatical coherence and is more influential to action than the lower contexts or stories also accessed (Cronen, 2004). The multiple contexts present in any one event are related to each other, and the meaning we make in the telling, as well as is made in the listening, becomes nuanced by how the story is told and the particular interplays of contextual meaning that are privileged in the telling.</p> |

Table 9 – Cont'd.

| Methodology | Term | Explanation |
|-------------|--|---|
| CMM | Hierarchy of Meaning (Cont'd.) | Different contexts move into the foreground and background even within one telling of a story, therefore, meaning changes commensurately and the various contexts influence one another. |
| | Social Forces of Logics and Meaning (or Logical Force) | Story patterns of the experiential relationship between levels of meaning (resources, contexts) and actions (conversational practices); often felt as oughtness, (deontic logics), that we bring into situations and act from them, with or without levels of conscious choice. Experienced as pressures to act a certain way, and may take the form of prefigurative, practical, contextual, implicative or reflexive force. Cronen, 2004, has identified other forces, but they are not all explicated here nor used in this study. |
| | Pre-figurative | Pressure arising from what just happened, or antecedent causality. Acting in response. |
| | Practical | Pressure to make a particular consequent happen in the future; or the feeling that a current act will help make a desired next act by some other person. |
| | Contextual | Pressure to act because of a perception that the context would require that action; acting in accordance with a prior understanding. |
| | Implicative | A felt need to change, modify, or transform contexts or prior understandings or create new ones, such as how an episode might be later interpreted or defined, relationships, self-concepts, group identity, etc. A concern for the future is central to implicative force. |
| | Reflexive (V. E. Cronen, 2004; W. B. Pearce, 1989, 1994, 2007) | Reflexive force direct attention to how the context(s) and contextual stories are linked to the responses of the other persons, and reflexive effects are linked to the how another's responses will implicate and effect future situations and the context(s). |

Table 9 – Cont'd.

| Methodology | Term | Explanation |
|-------------|---|--|
| CMM | Patterns of communication (Carpenter, 2006; W. B. Pearce, 1994, 2007; W. B. Pearce & Carpenter, 2007) | <p>From a social constructionist perspective, the organization and understanding of a conversation is as systemic whole that gives the 'what is happening' about the conversation meaning; a cluster of episodes that resemble each other. A pattern is distinguished also from the emergent functions that continue, boundaries intact, which attract other episodes that share central characteristics and deflect other episodes that would change them.</p> <p>Therefore, the apprehension of a pattern does not just consist of the elements of speaking and listening within it, but also the organization of the elements and the contexts in which the speaking and listening arise from, in response to, and reference or anticipate in social continuance. Linearly, this is often seen as a temporal sequence, such as antecedent-conversational event-consequent turns or episodes, but given that people are more complex and act in various ways, communicating from various perspectives such as mystery and intuition, the 'antecedent-act-consequent' model is but just one pattern. Analysis for patterns is therefore to look for the relationships between the parts as well as the emergent properties.</p> |
| | Punctuation (V. E. Cronen et al., 1979; W. B. Pearce, 2007) | The conceptual division and organization process of interactions into meaningful patterns that involves framing and delineating the beginning and ending of episodes, or turns within an episode. The beginnings and endings of an episode are fateful and matters of responsibility, as an awareness of the choice we have in how we punctuate episodes can lead to different possibilities and actions. |
| | Serpentine Model (W. B. Pearce, 2007) | A conversational map of turns sequentially arranged so as to show the interaction as it unfolds amongst persons and their social worlds. |
| | Stories Lived/Stories Told (LUUUUTT) (W. B. Pearce, 2007) | Stories lived are the episodes in which an individual or a group has engaged, and stories told are the narratives persons have about the episodes lives. Storytelling is a ubiquitous function of being a human being. Persons may not be aware of, nor able to tell the untellable, unknown, or unheard or untold aspects of lived experience. The "LUUUUTT" model (an acronym standing for Stories Lived and Told; Unheard, Unknown, Untellable, and Untold Stories) includes that which is outside of our named situational experience. |

Table 9 – Cont’d.

| Methodology | Term | Explanation |
|------------------------|---|--|
| Listening | Creative listening (R. K. Sawyer, 2007) | An appreciative form of listening and attentiveness given by one to another so as to validate, add, or advance the essential characteristics of an idea that is articulated to support action upon the idea. Examples of creative listening would be “yes, and...” as well as “plus-ing”, or “building” since descriptors seek to construct further meaning and action. Creative listening does not have to be positive, the essential characteristic is to further, extend, expand or build upon the idea of another. If a group senses or has seen patterns of creative listening, they are more apt to challenge, venture, and propose ideas. |
| Figurative Language | Analogy (Bonnardel, 2000; Dunbar, 2001a; Koestler, 1967; S. M. Smith et al., 2006) | Analogy use has been the basis of many important ideas and discoveries and recognized as important to creative cognition. Cognitively, retrieval is when a correspondence or partial similarity is made between the topic (the situation, object or system at hand) and vehicle (the system, object or system already known) domains. Mapping occurs when propositions or more complex constructions from the vehicle domain are juxtaposed onto the topic domain as an induction to form new knowledge and ideas. |
| | Improvisational Verb Usage (Weick, 1998a) | Gradations of conversational improvisation could be seen as variations of verb choice that correspond with the kind of change that is being made with the conversation and he distinguishes four gradations, from interpretative change to full improvisation: Interpretative change—(Verb) Shift Embellishment—(Verbs) Switch, Add Variation—(Verbs) Alter, revise, change Improvisational—(Verbs) Create, discover |
| | Metaphor (F.J. Barrett & Cooperrider, 1990) | A metaphor is a name, description, phrase, or action given imaginatively to something else. A metaphor functions to cognitively reorganize perceptions and invites a ‘new seeing’ or perception of the object (action, person, or experience) based on frameworks and characteristics of the metaphor (subject). A metaphor asserts similarity with something seemingly unrelated. Metaphors can fuse two disparate domains, and in so doing, transforms them both. This is possible because the fusion not only happens between two domains, but because it happens between semantic and cognitive reconstructions. |

Format of Table 9 adapted from Darrin Murray (2014), Navigating toward andragogy: Coordination and management of student-professor conversations. *Western Journal of Communication*, 78(3), 310-336. Copyrighted by the Western States Communication Association. Adapted by permission of the Executive Director, Western States Communication Association.

Practical application. As the final goal in CMM research, I addressed the practical need to make a better social world with what was learned by making knowledge claims in Chapter 5 as well as providing the participants of this study with a retrospective explanation of what was produced for creative collaboration in the Distinctive Greetings Project. The patterns shown from this layer of analysis demonstrate a structural analysis of conversation.

Third Phase of Analysis

At the same level of abstraction as the first level of analysis, the third layer of analysis on the use of figurative language and the use of emotional undertones was more of a content analysis and just as essential for understanding what conversational conditions facilitate creative breakthroughs. Themes were noted throughout these recursive discernments.

In the design of this study, I knew I would not have real-time access to participants as traditional CMM theory and approach would recommend, so I looked for other analytical approaches that would help me extract meaning from the text so that I could be more faithful to what was actually said and done. As this study focused on creative breakthrough moments in collaborative contexts, I chose to also look for and assess metaphorical and speculative language usage to further discern conversational patterns that facilitate creative breakthroughs.

As generative language reflects creative activity (F.J. Barrett & Cooperrider, 1990; Dunbar, 1997b; Johnson, 2010; Lakoff & Johnson, 1980; R. K. Sawyer, 2007), the third phase of the analysis was helpful in the identification of creative listening and figurative talk (e.g., metaphors, allegories, analogies, similes, builds, recombination, “pluss-ing”) that is evident in the text so as to further triangulate and discern patterns (Kohn, Paulus, & Choi,

2011). I color-coded the uses of figurative language in pink on my CMM conversational maps.

Weick (1998) also remarked that particular verb choices are indicative of certain gradations of improvisation moving from interpretation (shift), to embellishment (switch, add), to variation (alter, revise), to improvisation (create, discover), which have implications for change. I color-coded these verb usages green in the CA transcripts. The uses of figurative language and these different ranges of improvisational verbs helped to further establish patterns of conversational action since the literature also noted that the intra and intersubjectivity of the creative collaboration process is a socio-emotional one (Vera John-Steiner, 2000; Seddon, 2004), and infers further abstraction.

While I relied on the interviews for the texture of meaning made and the emergent immanent conversational patterns for creative collaboration, these two additional analyses (Phase 2 and Phase 3) were faithful to the actual in vivo intention of this study, and helped emphasize the efficacy of language meaning.

Combining Results from the Separate Analyses

A thematic synthesis was generated from these three multilayered analyses. I grouped the subthemes from each analysis to see similarities and whether or not any further distillation would emerge into a thick description. I paid particular attention to disjunctures as these were indicative of a change within the meaning that was made within the vignette. I noted where the breakthroughs occurred according to the interview data and the texts. Then I looked to see if the pattern of social forces, particularly implicative force and the emergence of bifurcation points, were associated with the reported creative breakthroughs. I wrote an intensely detailed thick description, and then re-wrote the thick description of thematic patterns as unfolding conversational conditions necessary for creative breakthrough per

vignette. The summary of findings is derived from a further reduction of themes holistically discerned from the three vignettes. The findings are presented in Chapter 4, with a discussion and conclusions following in Chapter 5.

CHAPTER FOUR: MAJOR FINDINGS

In the previous chapter, I described the Distinctive Greetings Project as a case study, the research methods used for data collection and analysis, and introduced the participants. As this study was an inductive, exploratory study of the conversational conditions that facilitate creative breakthroughs in collaborative workgroups, the key findings for this study are based on the main patterns that emerged from the thick description of each vignette. This chapter presents the six major findings from the vignettes' thick description that answered the research question: "What conversational conditions facilitate creative breakthroughs in collaborative workgroups?"

In order to figure out if there were conversational conditions that could facilitate creative breakthroughs in any workgroup and be replicated, I conducted a study where I might find creative breakthroughs through the design process dialogues of a product design collaboration that was videotaped. At the end of the sessions in April, most of the participants identified the most creative moments by anonymous questionnaires. From their responses, I then identified and transcribed the three most illustrative ones, paying attention to fully transcribe communicative action by gestures, body position and movement, facial expressions, and spoken utterances of all of the participants in the interaction, not just the speaker. I interviewed and recorded participants' reflections about those creative moments. Participants' reflections on meaning made about those creative moments were then reiteratively analyzed with the sequential episodes of dialogue. Three different methodological lenses described in Chapter 3 were then used to discern the interwoven patterns of action and meaning that produced creative breakthrough moments, and then checked against five criteria for creative breakthrough that I had gleaned from the literature.

Overall I found that a reflexive pattern of critique, relationship, responsibility, idea generation and modification, and reframing authorship enabled participants to coevolve design narratives that made new meaning for creative breakthroughs. New creative meaning emerged from the reflexive coordination of communicative actions and contexts⁴⁶ in an improvisational dynamic structure of six specific conversational patterns.⁴⁷

The main focus of this chapter is a summary of the six specific conversational conditions that answer the research question. Before that summary, I set the stage for understanding how the research question was answered. Because all creative activity does not necessarily produce creative breakthroughs, nor are creative breakthroughs generic in nature, I remind the reader of the creative breakthrough criteria and qualifications and briefly summarize the analysis of creative breakthrough emergence for the three vignette episodes. I explain next how the three methodological research lenses were used to find the six specific conversational conditions. Specific conversational conditions refer to the subepisodes within a whole vignette that were shaped by particular turns and contexts while general conversational conditions describe overall conditions of the project as a whole episode; such as the project's organization. A summary description of the general conversational conditions found that also served as a contextual framework for the interactions precedes the summary of the major findings.

Creative Breakthrough Qualifications and Criteria Met

Creative breakthroughs do not have to be of a genius cognitive pattern nor of a charismatic social pattern: They do not have to be flashy or in completed form as they can be

⁴⁶ Contexts include the participants' identification of contexts they drew upon as well as the CMM social forces contexts I impugned from analyzing the language action and contexts the participants said they were using.

⁴⁷ Generally, I name the six reflexive conversational patterns as critique, relationship, responsibility, co-evolution of design story and solutions, idea generation and modification, and reframing authorship.

discerned in the process of emergence. In the process of emergence, creative breakthroughs in a collaborative workgroup would then likely be conversations that broke through a perceived obstacle in making meaning or in action with others. The perceived obstacle could be socially or cognitively derived yet framed by a set of mental models or associations. The breaking through could then yield various apprehensions of new and useful ideas: A clearing or opening for new perception, a new combination of associations, a new horizon of possibilities and affordances. The qualification and criteria for how creative breakthroughs were noticed and analyzed in the process of a collaborative, product-design workgroup is explained further below.

In this study, creative breakthrough is defined as a set-breaking heuristic through an obstacle in a patterned way of thinking, being, or acting for accomplishment. Set-breaking heuristics and the exploration of new cognitive pathways are foundational for the presence of creativity (Amabile, 1983). Obstacles could be evident from other's behaviors and speech acts, or from outward indications (e.g., utterances, body movements, tonal changes, etc.) of internal forces or frustrations. Set-breaking heuristics therefore could be thought of as possibility or positive interruptions in a predictable course of action. In the CMM communication perspective, a creative breakthrough was evident as forwarding or future-focused interruption in the communication patterns of what was said and done interactively within the episode. The discernment of creative breakthroughs is analogous to the detection of shifting patterns of understanding, meaning, and action within a collaborative workgroup's interaction. Shifting patterns of meaning-making would imply a shift in how persons accessed and used contextual resources to understand and make new associations in the interactions themselves which would then lead to new and useful ideas.

The three creative vignettes were analyzed for the presence of the following five criteria for creative breakthrough. Those creative vignettes that had three criteria present were then further analyzed for the conversational conditions which may have facilitated the presence of these criteria.

1. Something said or done that indicates a new opening or clearing of perspective, which could be in utterances or body movement that indicate the entertainment of something unconsidered in a particular way. For example, “Ok, I see, I never thought of that.” or “Ah-haa, I can see how what you are saying connects to” or other comments or body movement that might reveal vulnerability, a letting go of a previous idea (or loosening the grip of something previously believed or conceived), or something unconcealed (hence the element of surprise expressed).

2. Ideas expressed in rapid succession amongst people indicating a build or connecting ideas from multiple sources, or a new combination of ideas. For example, “And another thing I thought of” or “this reminds me of”. These phrases have also been labelled as plus-ing behavior as it shows associative connection and ideational contiguity. Builds also occurred as challenging questions or as exploratory questioning.

3. Energy or affect shifts visible in the videotape of the speaker and the surrounding group(s) such as smiling, nodding, and joking or playful comments that make the dialogue and connectivity amongst the participants or the with the design idea increase,.

4. As explained in Chapters 1 and 2, the use of figurative language (e.g., metaphors, analogies, similes, etc.), creative listening, and improvisational verb use indicate the presence of high creativity. Persons show an improvisational range when they use certain verb transitions. The improvisational range is bracketed by interpretative shifts on the low side

and full-out improvisations made on the high side. On the low side, verbs such as shift or move indicate interpretative changes while dialogue is occurring. Next in the range (from lowest to highest) are verbs like switch or add, and show embellishment. Moving closer to full improvisation are verbs that signal variation, like alter or revise. Finally, full-out improvisation is in construction when verbs such as create or discover are used (Weick, 1998).

5. References made back to some prior creative moment in the weekly Distinctive Greetings project sessions over the course of a semester.

The major similarities amongst the vignettes are that creative breakthroughs were contiguous with critique and a new opening or perspective shift, the use of appreciation and figurative language, and mood changes. Table 10 summarizes how each vignette met these criteria.

Table 10

Evidence of Creative Breakthrough Criteria from Communication Process

| Criteria & Criteria's Expression | | | | | |
|----------------------------------|---|---|--|--|--|
| Participant | New openings | Multiple ideas connected, combined | Energy/Mood shifts that increased connectivity and momentum | Figurative language & Listening used Creative Listening, and Improvisational Verb Transitions | References Made Back to a Prior creative moment or experience |
| Dora | Lets go of how she was telling the design story | n/a | Tensions to affirming | Creative listening Analogy offered & affirmed | n/a |
| Samantha | Three shifts: 1) Focus on story for C4; 2) Focus on customer; 3) Medical focus to a 'Distinctive' consumer focus | C4 made mutual builds –students witness and ask questions | Positive energy start to finish; even with incisive critiques | Example stories and analogies used to embellish and vary | n/a |
| Bailey | Two confrontations from Tulip and then she lets go of being the critic and offers an 'opposite' idea | Multiple variations and builds on 'opposite' idea | From mutual frustrations and disconnection to playful, generative mood | Analogies Creative listening Metaphors Irony used across improvisation range (from interpretation to improvisation) | References to Bailey's prototype experiments Reference to designers as introverts |

Only Bailey's interaction has evidence of all five criteria for creative breakthrough, and the breakthrough attained in this session was referenced by all but one as the most noticeable breakthrough of the whole group. The positive or negative emotional valence and mood of each episode were linked to the connections needed to advance the design story or solutions for the design problem. During the course of the semester's sessions, Tulip once made the comment that "You have to be able to sell your idea emotionally to the client," and the students first needed to be able to sell their idea to C4.

Research Methods Used

The analysis of the texts and data to determine the conversational conditions was conducted with the research methodologies of conversational analysis, CMM theoretical and research analytical frameworks, and the incidence of figurative language use. These have been described more fully in the Research Methods Used Chapter (Chapter 3). Each method had particular value for the recursive, reflexive, and reiterative analysis process described in Chapter 3.

Conversational analysis enabled the researcher to appreciate the interactions as they more occur in naturalistic settings, and the subtle emotional interplays that accompanied or preceded action. The talk and listening reactions that combined for creative breakthrough emergence were viewed as systemic wholes rather than a more two-dimensional interaction analysis of only the verbalized utterances. CMM analysis enabled insights into how action and meaning making combined to facilitate creative breakthroughs. Figurative language use enabled further exploration of the creative enactments in two ways: First, the language content added dimensionality and richness to the potential of the creative. In addition, by considering the language content and its reflexiveness with the dimensionalities of sequential

action and meaning making, the ranges of language improvisation were made more visible. In the further explanation of findings below, I refer to them as I describe the specific conversational patterns found.

The patterns found were based on the reiterative and recursive analysis of the sub-episodes within each overall vignette episode as I show in Table 11, which offers a comprehensive analysis summary of each of the overall vignettes. The shaded boxes below are the subepisode groupings that would loosely constitute a theme in answer to the question, “what is going on here?”⁴⁸ The subepisode groupings do not neatly lay themselves out in conversational triplets as Pearce (2007) would suggest, but rather were arranged the way they are because of a more general sense-making that the participants were engaged in that I observed. For each subepisode grouping, I show how I arrived at the above shaded summation.

⁴⁸ See Appendices M1a-c for further insight into the conversational dynamic.

Table 11

Summary of the Analysis for Creative Breakthrough Emergence of the Three Vignette Episodes

| Sub-Episode Grouping & Turns Over Time with Analytical Evidence (see notes) | | | |
|---|---|--|---|
| Sub-Episode | Bailey | Dora | Samantha |
| 1 | <p>Presentation & tolerance. Turns 1-3</p> <ul style="list-style-type: none"> • CA: Emotions observed: C4-Flat Affect, Bailey-lots of talking • Fig. Lang.-Metaphor • CMM: Serpentine; Begins Contextual-Prefig. Logical Force Pattern. | <p>Presentation jumble & interruption. Turn 1-2</p> <ul style="list-style-type: none"> • CA: Emotions observed: Distracted, body shifting, looking away, eating lunch, leaving the room • CMM: Serpentine, Logical Force Pattern Prefig/Contextual | <p>Presentation & connection. Turn 1</p> <ul style="list-style-type: none"> • CA: During presentation C4 affirms with head-nodding, smiling • Fig.Lang.-Analogy |
| 2 | <p>Critique-Confront/Resist to a point of breakdown. Turns 4-13</p> <ul style="list-style-type: none"> • CA: Emotions observed: Rising tensions, B/silences, C4 cold tones of voice. • Fig.Lang.-Analogy • CMM: Serpentine; LUUUUTT, Contextual-Prefig. Force Pattern Buildup. | <p>Critique in mutual attempts to clarify & not understanding feedback. Turns 3-7</p> <ul style="list-style-type: none"> • CA: C4 frustrated in questions to clarify, Dora's voice strained, rising tone. Tension rising. • CMM: Serpentine, Logical Force: Prefig./Contextual Force Pattern | <p>Joins with Samantha in giving critique. Turn 2</p> <ul style="list-style-type: none"> • CA: Offers crit.in warm tones/head nodding • Fig. Lang.-Analogy |
| 3 | <p>C4 joins Bailey—Tulip appreciates Bailey's former experiments. Offers the 'go opposite from Distinctive Greetings' image' suggestion. Group joins with C4 & builds. <i>Bailey lets go, considers, then owns & reframes design problem.</i> Turns 14-18</p> | <p>Dora lets go & makes a relational offer to change scenarios of design story. Shows concern to C4, who responds with acknowledgment, critique, & metaphorical story. Turns 8-11</p> | <p>C4 idea generation- builds design story scenarios. Samantha accepts. Turns 3-12</p> |

Table 11 – Cont’d.

| Sub-Episode Grouping & Turns Over Time | | | |
|--|---|--|--|
| Sub-Episode | Bailey | Dora | Samantha |
| 3 | <ul style="list-style-type: none"> • CA: Emotions observed: Heavy tension to intrigue to lightness, play, excitement. Tulip ‘acts’ out the impact needed. • Fig.Lang.-Analogy, metaphor • CMM: Serpentine; Shifts: Context; Logical Force Patterns from Context/ Prefig to Implic/Practical. 2 Bifur.Pts: Tulip in Turn 14, Bailey in Turn 18. • <i>Cr.BT Pt in Turn 18: “Random Acts of Truth”</i> | <ul style="list-style-type: none"> • CA: Emotions observed: Warmer; tones of voice, body movement literally reaching out. • Fig.Lang.-Metaphorical story Turn 11 bridges mutual understanding. • CMM: Serpentine, Contextual Shifts by Dora, 2 Bifur. Pts –Dora’s offer signals “I’m now open to listen to you,” - Violet joins Dora relationally in Turn 11. Implicative Force interrupts Prefig./ Contextual force pattern. | <ul style="list-style-type: none"> • CA: C4 looking at each other, smiling, leaning in, hand and arm gestures of drawing, Samantha writing while shaking her head affirmatively; body positions mimicked between C4 Turn 7, Samantha nodding her head yes while writing; C4’s tone of voice excited, gathering energy. C4 smiling and looking at Samantha as Wendy builds with personal story in Turns 9, 10, 11. Samantha looking at them in Turn 12. • Fig.Lang.: Analogy and confirmations, Turns 2,3,4,9,11. |
| 4 | Students & C4 build on possible design story scenarios & solutions. Turns 19-21 | Dora affirms Violet’s metaphorical story as a parallel to her design problem. Prof restates, adds to validity of design problem. Tulip recaps. <i>Dora owns her new opening for action on her design. Turns 12-16</i> | Professor interjects question on aspect of design solution.C4 challenge/confronts him for it. <i>Samantha lets go prior context. New realization. Turns 13-17</i> |

Table 11 – Cont'd.

| Sub-Episode Grouping & Turns Over Time | | | |
|--|---|---|---|
| Sub-Episode | Bailey | Dora | Samantha |
| 4 | <ul style="list-style-type: none"> CA: Participants playful, pushing boundaries, bantering, smiling, laughing. Fig. Lang.-Metaphor, analogies CMM: Serpentine; Contextual shift as Bailey realized she could push a client's boundaries entering into this sequence of turns. | <ul style="list-style-type: none"> CA: Dora animated facial expression, light-hearted tone of voice, C4 affirmative head nodding. Fig. Lang.-analogy CMM: Serpentine, Contextual Shift so design story and solutions improved. Interview data revealed a LUUUUTT resolution here. <i>Cr. BT Pt: Dora owning new opening for action with C4 to improve her design story/design. In Turn 12, and in reflection during Turn 13.</i> | <ul style="list-style-type: none"> CA: Samantha is looking at Professor, tilting her head. C4 distracted while Professor speaks. Samantha writes in Turn 14, 15, and nods her head yes in Turn 16 to Violet's market comments, goes back to writing in Turn 17.* CMM: Serpentine; Shifts: Context/Prefig to Implic Force, Bifur Pt. <i>Cr. BT Pt.- Shifted contexts: "Impt on how to serve client – not pleasing C4".*</i> *Samantha reported in the interview that this was the breakthrough point for her, when she changed contexts and was writing her realizations. |
| 5 | <p>C4 validates Bailey & other students' designs: Could enlarge Distinctive Greetings' appeal to younger generation & ultimately change image of Distinctive Greetings. Bailey sees her next actions. Turns 22-24</p> <ul style="list-style-type: none"> CA: More reflective & subdued, somewhat pensive facial expressions. CMM: Serpentine; Shift began from a Implic/Practical Force Pattern to a Practical/Practical Pattern. | | <p>Another student questions & C4 begins to shift focus to aspect of design solution with scenarios. Turn 18-21</p> <ul style="list-style-type: none"> CA: Action shifts with Bailey's question and people looking at Bailey, C4, and C4 looking at each other. Interest in new aspect of design solution. CMM: Serpentine: Prefig/Contextual to Contextual Force Pattern |

Table 11 – Cont'd.

| Sub-Episode Grouping & Turns Over Time | | | |
|--|--|------|--|
| Sub-Episode | Bailey | Dora | Samantha |
| 5 | <p>C4 offers more resources for various expressions of Bailey's design solutions. Turns 25-29</p> <ul style="list-style-type: none"> • CA: Emotions observed: Helpfulness for Bailey's presentation the following week, quick pace. • CMM: Serpentine, showing the build | | <p>Students & C4 in idea gener/mod. on aspect of design solution (avatars). Samantha expands her contextual grasp of relating to client. New realization. Turns 22-27</p> <ul style="list-style-type: none"> • CA: C4 smiling, leaning into the camera, affirmative head nodding as Samantha presents the avatars. • Fig.Lang.: Avatar in metaphor (flower); prompts analogy builds afterwards with other participants. • CMM: Serpentine; Shifts: Context/Contextual to Implic/Prac Force, Bifur. Pt. • Cr.BT Pt.-Emotive design for customer & her 'world' |
| 6 | <p>Acknowledgment & reiteration of critique. Turns 30-32</p> <ul style="list-style-type: none"> • CA: Tone of voice to end the conversation; Wrapping it up. • CMM: Serpentine; Logical Force Pattern: Contextual/Practical | | <p>Samantha reframed her design problem & solution focus. Owns & extends client's in new direction w/her design. Turns 28-31</p> <ul style="list-style-type: none"> • CA: Recap in Turn 28 prompts affirmative head nodding, groups looking at each other, and as Tulip builds further in Turn 30, C4 affirmative body movements. • Fig.Lang.: Analogy of Mom and flower • CMM(Bifur.Pt) Cr.BT –Turn 31- "Helping people be their best" |

Table 11 – Cont'd.

Legend

- Each “box” represents a highlighted description of what is happening or the pattern emergence of the sub-episode grouping above the line and below the line, the methods used to make such a description or identify the pattern. The identifying description was made after many iterations of analysis using each, and then the synthesis of the methods below. Bailey and Samantha had more sub-episodes because their overall vignette was longer.
- Methods Used:
 - CA= Conversational Analysis, where the social-affective aspects of the interaction could be noted and accounted for in coordination with what was said and the responses of the listeners while it was being said so the ‘whole’ of the communication was observed. See Appendix T1-3 for the full CA transcripts of the interactions.
 - Fig. Language= The use of figurative language, which included analogy, metaphor, creative listening, parallel construction, similes, and improvisational verb choice that occurs in a range from interpretative change on the low side to full creative improvisation on the high side. See Appendix M2a-c for a graphic depiction of the figurative language use.
 - CMM= Analysis consistent with the research methodology and communication theory of the Coordinated Management of Meaning as outlined in Chapter Three, with the heuristics that track the coordination of action (e.g., the Serpentine, conversational triplets or pairs, and episodes) with the heuristics that enable visibility into coherence and the making and managing of meaning (e.g., contextual hierarch, the LUUUUTT, the logical forces of pre-figurative, contextual, implicative and practical force, and bifurcation points). See Appendices M1a-c and M2a-c for the first and second levels of analysis used with CMM.

Each creative breakthrough emergence is shown in italics type-face, and occurred at approximately midpoint in the particular overall episodes. Each creative breakthrough emerged with evidence of shifts and changes in mood and affect, letting go, and an enlargement of the ‘old’ contexts-in-use with new realizations that changed the direction of the design story and available solutions. While each vignette episode had similarities in the first two subgroupings (presentation and critique), each vignette shows a unique coevolution of the design story and solutions that built both on the critique and the design as presented.

Categories of Conversational Conditions

Two categories of conversational conditions are describable from the data. The first category was the specific contexts, actions and logics of specific sub-episodes within each creative vignette (specific conversational conditions). The second category were the general contextual conditions of the Distinctive Greetings Project overall; how the project was organized, the roles the design professionals and design students took on and the implications of those roles for an experience of equality or inequality of participation, and the medium of communication.

Although the general contextual conditions had influence in the contexts of meaning that were drawn upon while people interacted, they did not determine the facilitative conversational conditions for creative breakthrough. Only the specific conversational turns which are observable and comparable can give good evidence for creative breakthrough conversational conditions. Only from the turn-by-turn subepisodes could facilitative language action and meaning-making patterns be discerned that facilitated creative breakthrough emergence.

Summary of General Contextual Conditions Found

The general contextual conditions provide a contrast to the accomplishment of creative breakthrough evident from the specific conversational conditions. From observations of the videotaped class sessions and the interview data, four general contextual conditions also shaped the resources, practices and forces the participants used in their interactions. The four conditions were

1. Two definite groups rather than one focused team worked together on four individual student projects.

2. There was a present-critique-incorporate critique-modify pattern of interaction.
3. Felt disparity and hierarchy between groups, with the C4 group as occurring with higher status than the Levenger group.
4. Dissatisfaction and difficulties were experienced with the videoconference tool.

From the interviews the participants said these four conditions had the collective effect of making it harder for them to relate to each other as well as limiting the creative collaborative experience. In terms of conversational pattern evolvment, the general contextual conditions could also have had the effect of adding a layer of obstacles to overcome within each interaction.

These conditions would combine with other dynamics of the interaction as unwanted contextual or prefigurative forces that limited rich, interactive idea generation as well as an experience of desired collaboration. All of the participants thought that the videoconference tool limitations noticeably foreshortened design possibilities as people could not see the storyboards, draw their ideas to each other, or hear well. Most important, they said they could not see each other well enough to pick up the social cues that would allow them to interrupt the flow of the conversation in productive ways to materially make a better suggestion on an aspect of the design or design story. The hindering implications of these general contextual conditions are contrasted with what could have been possible in the specific interactions had the organizational conditions been different, which is briefly discussed in the qualifications of this study section in Chapter 5.

Summary of Specific Conversational Conditions Found--Major Findings

The creative breakthroughs that emerged within the course of the Distinctive Greetings Project are a combination of breakthroughs achieved in a mutual evolvment of

design story dialogue and communication product design concepts by the design students and professionals in the project. Although the creative breakthroughs were made in sequential dialogue, each one also represents layers of contextual meaning interplay between the participants. Consequently the production of the creative breakthroughs has social, affective, and cognitive components that intermingle to produce new meaning in the design story or the communication product design concept.

The main focus of the research was on the process and conversational conditions that produced creative breakthroughs, not the quality or field-changing potential of the design product concepts. Given that the presence of creative breakthroughs was not guaranteed nor can be predicted at the outset, the overall process used to answer the research question was to first find and highlight the participants' creative breakthroughs, and then determine if there were conversational conditions that facilitated them.

Six specific conversational conditions were found to facilitate creative breakthroughs in this case study. The six specific conversational conditions that answer the research question and represent the key findings follow:

Finding 1: For creative breakthroughs to occur, participants had to interrupt familiar perspectives. When the participants experienced challenge and critique, it interrupted prior and/or customary ways of thinking, allowing them to generate new and useful ideas.

Finding 2: An expression of relationship and connection from one participant to another was necessary for the letting go of what one 'should' do and invited the other participant into a relationship of what they could do.

Finding 3: The evolution of creative breakthrough experience pivoted on participants taking responsibility for how their choices affected others.

Finding 4: Creative breakthroughs were produced in the group's co-evolution of the design story that ultimately resulted in a communication product design concept.

Finding 5: Group idea modification and ideation with C4 facilitated creative breakthroughs, but with the whole group ideation occurred only AFTER the group saw the presenter incorporate the C4 and this had an additive, not transformative effect.

Finding 6: The students incorporated and reframed critiques and then authored their creative breakthroughs.

The meaning of the findings will be discussed in depth in the next chapter, but it is useful to summarize some observational aspects of what these findings show. These creative breakthroughs were generated by two groups of designers with varying competencies and perspectives. Therefore, each group, as well as each individual, had different contextual resources to draw upon as she or he communicated in the design process. The creative breakthroughs reflect a shifting of contexts-in-use amongst participants as they discussed and evolved the design story that ultimately resulted in a communication product design concept.

Each creative breakthrough achieved also changed the context in which the dialogue occurred, creating a better and different short term future in terms of how they would participate together for the next session, as well a longer-term future in terms of the design product concept's possible future impacts. Participants were challenged and critiqued by C4. Even though they may have disliked their initial experience from the challenge, they said

they found the interaction would enable them to construct richer contexts from which to draw upon for their design story and design concept. Group dynamics enabled participants to access more contextual resources for each design. Individual creativity and creative effort was afforded and valued within the overall project structure and group dynamic. Further, these specific conversational conditions stand out because the participants achieved results despite overall perceived general conversational conditions of difficulty, as described above in the Summary of the General Contextual Conditions. In the specific conversational condition findings I summarize below, I give the reader brief illustrations, references to the turn-by-turn evidence in the attached appendices, and a preview of some different nuances of breakthrough emergence and brief illustrations.

What is important about these specific conversational patterns across the vignettes is that they show how the coevolution of action and meaning making happen to produce creative breakthroughs. These conversational condition patterns for creative breakthroughs hold up across the vignettes although each vignette and breakthrough experience was uniquely nuanced and particular to the presenter and project involved. To qualify as a conversational condition finding, a similar conversational pattern needed to be observable across two or more vignettes. To count as a pattern, evidence from two or more of the research methods used for analysis needed to be congruent. In this summary I only highlight some of the most pertinent of the patterns that support the finding. The chapter closes with a short synopsis of the findings.

Presentation of Findings that Answer the Research Question

Each of the findings below represents a particular facilitative facet of an overall conversational pattern that constituted creative breakthrough emergence in a group design process.

Finding 1: For Creative Breakthroughs To Occur, Participants Had To Interrupt Familiar Perspectives

When the participants experienced challenge and critique, it interrupted prior and/or customary ways of thinking, giving them an opportunity to generate new and useful ideas.

Each design was presented in a narrative of scenarios that were meant to show how the design concept would be used by Distinctive Greetings' potential customers. These design stories and design concepts were then critiqued and challenged by C4. Even though the university group wanted and appreciated the insights of the professional designers of C4, their critiques and challenges interrupted the story line of the design presentations, and were not always welcomed; some met with anxiety,⁴⁹ some defiance as Bailey's chin-up posture showed while C4 questioned her thinking,⁵⁰ or the silence and uncertainty⁵¹ from the Samantha episode. Therefore, in order to effectively challenge the design story and problem as presented (Dora and Bailey episodes), or to specifically provoke more implicative thinking and storytelling (Samantha episode) participants would have to break through the social and

⁴⁹ In making reference to the CA transcripts I will refer to the turns, column of communication (e.g., Language content and other communication), and line numbers within the tables for the reader's ease in locating evidence, depicted as "Turn/lines". As seen in the Dora episode, Appendix T1, Turns/lines: 1/51-53-- Other communication column; 2/58-59; 3/65; 4/66-67 both the language content column and the other communication column. Additionally, Dora reported in her final interview that she would get physically and emotionally stressed in trying to present to and then process what C4 had said during sessions with C4.

⁵⁰ As seen in the see the conversational analysis transcript of the Bailey interaction in Appendix T3, Turns 5-11, and more particularly, Turns/lines: 5/86-89 reading across the two columns, 6/107 across the two columns, 9/152-154 read across lines in both the language column and the other communication column, 10/155, Turn 11/159-171 as it repeated what was said before and the other communication column.

⁵¹ As seen in the conversational analysis transcript in AppendixT2, Samantha episode, see primarily in the other communication column, Turns 11-14: 11/140-144, 12/143-144, 13/146-148, 14/159.)

affective obstacles that also emerged at the outset and within the interactions. The challenges may have begun gently at first, and then shifted to become more pointed and suggestive as they did with the critique in both Dora and Bailey's episodes.⁵²

Critiques interrupted what the presenters had planned and wanted to elicit from C4 and instead provoked patterns of tension and frustrations between the groups, especially in the Bailey and Dora vignettes, as shown in Table 11, in the second subepisode grouping and in Appendixes T1 and T3.⁵³ The interruptive critique pattern turned successful when the student would begin to generate other perspectives and see her design story differently (Dora), or begin to incorporate a C4 suggestion (Samantha, Bailey).⁵⁴ The shift to critique incorporation and the generation of other perspectives was accompanied by relational or responsibility moves in sub-episode grouping three, although it took many more turns in Bailey's vignette than Dora's.⁵⁵ Because relationship and connection was evident in the Samantha vignette from the beginning, these transitions did not occur in the same way.⁵⁶

⁵² As seen in Appendixes T1 Dora, both language content and other communication columns, Turns/lines, 7/102-103; line 107; 9/113-116; and T3 Bailey, both the language content and the other communication columns should be read together for Turns/lines: 4/84, 6/101-102, 9/151-154; 12/172-175.

⁵³ See Appendix T1 for the Dora vignette and Appendix T3 for the Bailey vignette. In the Dora vignette, the frustration or impatience is seen the language content and other communication columns of Turns 3,4, 6, and 7 when Dora keeps explaining but C4 doesn't understand as they feed back in Turn 7. In Turn 5, lines 72 and 73, Bailey interjects a question to help Dora clarify.

In the Bailey vignette, C4 attempts to interrupt Bailey's trajectory **five times** at Turn 4/84-85, Turn 6/97-102 even with a negative evaluative comment "something beyond paper and thoughts like congratulations-it takes it further than this stuff" (Tulip) at lines 101-102, Turn 9/151, Turn 10/155, Turn 12/172-175. Yet, Bailey repeatedly deflects the feedback she's getting in Turns 5/86-93, Turn 7/114; and kept trying to get the feedback she wanted in Turn 8/119-146, Turn 11/159-171; and finally tries to connect with C4 and tie it to her original conception in Turn 13/176-190.

⁵⁴ See T1, Dora vignette, Turn 8/108-110. In the Samantha vignette "student incorporation" could be inferred by her body movement, facial expression, and writing which are seen in the other communication column in Turn 13/146-147, Turn 19/200; and when Samantha speaks in Turn 22/217-224 and the reaction by C4 for those same lines in the other communication column. In the Bailey vignette, Appendix T3, Bailey begins incorporation at turn 15/213-214, and Turn 16/218.

⁵⁵ As seen in Appendix T3, Bailey slowly shows consideration and incorporation between Turns 14 and made her last evolution in Turn 18/229-233.

⁵⁶ Comments by C4 made to Samantha that indicated relationship and connection are in Appendix T2, both columns, Turn 1/68-77 (other communication column), Turn 2/97-98, 101-106, and then C4 begins to build in Turn 3/108, Turn 4/109, Turn 5/110-117.

Figurative language use (e.g., metaphor, analogy) and a generosity of listening accompanied part of each successful interruption. The second half of the episodes pattern showed a deepening or an expansion of the critique within the design story or the product design concept, observable in just the texts and further underlined by CA and CMM analyses, see Appendixes T1-T3. Yet, the process of getting there was not always smooth sailing. The following description of how these interruptions occurred highlight two powerful struggle patterns that later shifted to new awareness with other specific conversational conditions. Creative breakthroughs were launched with interruption into perspective taking.

Interruptions of familiar perspectives. From the interviews with each of the C4 participants, I learned no matter what the form of C4's initial critique was in each vignette, each critique was made to interrupt the way in which each presenter conceptualized and related to her design for the sake of pushing the design story or concept further. The students consistently gave lengthy explanations when they first presented in their sessions with C4,⁵⁷ see Appendixes T1-T3. C4 would then question the design story of each student to reveal gaps in the design problem (Bailey),⁵⁸ clear up confusion in the story (Dora),⁵⁹ or incite the student to generate a more plausible scenario for the client's customer (Samantha).⁶⁰ Each vignette reveals that dislocation to the initial critique (Bailey, Dora), or one made later in the episode (Samantha) happened and changed the direction of the designs' evolvment (see Table 11, for an overview, subepisode 2 for Bailey and Dora; subepisode 4 for Samantha; for

⁵⁷ In Appendix T1, Dora vignette, see Turn 1/1-57 and Turn 6/75-100. In Appendix T2, Samantha vignette, see Turn 1/1-100 (her lengthiest turn). In Appendix T3, Bailey vignette, see Turn 1/1-63 and Turn 3/71-83.

⁵⁸ See Appendix T3, Turn 2/64-70, Turn 4/84, Turn 6/97-102, Turn 9/151, Turn 10/155 and Turn 12/172-175.

⁵⁹ See Appendix T1, Turn 9/111-116, and Turn 11/124-130.

⁶⁰ See Appendix T2, Turn 2/97-106

the specific turns in Appendixes T1-T3,⁶¹ Appendixes M2a-c for the observance of prefigurative/contextual force patterns).⁶²

Two patterns of tensions were revealed by CA and CMM analysis. The first blocking pattern was the presence of uncommunicated, negative, background interpretations or stories about the situational contexts of working with each other, first made observable by conversational analysis, and then the background meaning-making made visible by the CMM heuristic the LUUUUTT (Bailey and Dora episodes, see Table 11, for where the LUUUUTT heuristic was applied, subepisode 2, Turns 4-13 in the Bailey vignette, and in the Dora vignette a LUUUUTT resolution was confirmed by Dora in Turn 12/140 when she said, “No, that is right on”(Dora) in response to the multi-layered connection Violet offered in Turn 11).⁶³ These negative interpretations prevented constructive listening and the creation of new meaning with those same persons or in session.

Second, a pattern of limited social action was made visible by the reactive, prefigurative and contextual force repetitive pattern of the CMM logical forces heuristic.⁶⁴ Drawing upon prior experience or sociocultural norms specific to either the professional design context or the design student context, the participants relied on their respective versions of obligatory social force (deontic logic), which limited the range of action and

⁶¹ Dislocations to the initial critique in the Bailey episode, Turns 4-13; in the Dora episode, Dora was somewhat dislocated by Violet’s coughing as seen by Turn 1/51-57 other communication column, and then in Turn 2/58-59, and then in Turn 6, line 100 when she noticed she wasn’t being clear. In an interview, Samantha referred to the dislocating effect of refocusing her to the clients’ customer while watching C4 and Professor Robinson interact in Turns 13-17.

⁶² See Appendix M2a (Bailey), Turns 2-13; Appendix M2b (Dora), Turns 1-8, 9-11; and Appendix M2c (Samantha), Turns 13-21.

⁶³ Dora revealed in an interview that she was concerned about how much attention could be paid to the students’ presentations by C4 as they ate lunch during the student presentations and that Violet had not been present for her earlier presentations due to other commitments. She also repeatedly cited how difficult the Adobe Connect medium was to really feel like things were getting understood.

⁶⁴ The reactive pattern will be referred to hereon as “prefigurative/contextual forces” as the prefigurative force and the contextual force combined together in a reactive way. The evidence of this pattern is the same as the turns and lines referred to in footnote 62 from the Bailey, Dora, and Samantha vignettes.

interpretations they could take with each other. The tensions led to breakdown and impasse as dialogue and forward progress slowed almost to a complete stop in the Bailey vignette, see Appendix T3, both columns, Turns 4-13 and Appendix M2a, from Turn 1-13 for the prefigurative/contextual force pattern. These patterns were observable and blocked the interactive dialogue for idea enrichment and a mutual engagement in the initial critique. Both CA analysis showing body movements, tonalities, pacing, and the CMM analysis indicated typical assumptions and ways of relating to each other and the design process had to shift before the ideas were pushed further (for overall pattern see Bailey Subepisodes 1-3 in Table 11, and Appendix T3, same citations as above).

The most telling textual clue to the presence of this sense of obligation or deontic logic is the use of the verb or verb phrases of *ought*, *to*, *must* or *in order to*, and refers to a particular sociocultural contextual framework by saying something.⁶⁵ The felt experience when deontic logics are present is a sense of oughtness. Depending on how this social force of oughtness is used and said, it can set off unwanted repetitive patterns of interaction or wanted patterns. A reliance on prefigurative force in deontic logic anchors participants to a past or a standard, often assumed and not mutually felt or explored. A dominant aspect of the unwanted pattern between Tulip and Bailey over the semester was anchored in the deontic logic of what “the other should do” (Bailey). As for the student, Bailey’s logics indicated that “Professors should help their students when they are stuck...they should give me an answer (Bailey)”.⁶⁶ In the logics of the design professional, Tulip’s assumptive

⁶⁵ Sociocultural contextual frameworks is another descriptor of the range of contexts and norms we reference automatically in action, forming our contexts-in-use. I refer the reader to my earlier descriptions of the hierarchy of contexts as but one example of those sociocultural frameworks, see Chapters 2 and 3.

⁶⁶ Reported in the interview when I asked Bailey what she thought was happening between Turns 1 and 13 in her episode.

perspective was that: “design students should take critique and deal with it, make a change or make a strong argument why not (Tulip).”⁶⁷

These contextual and social deontic logics played out in action. Tulip’s first critique attempt with Bailey used the verb *should*: “Maybe you should think about what’s tying these all together?” and “What you are trying to do? with all of them?” (Tulip, see Appendix T3, Turn 2/64-70). This triggered Bailey’s context of what professors should do as she repeatedly attempted to get C4 to help her to figure out her upcoming presentation with further explanation.⁶⁸ In Turn 13 Bailey tried to elicit C4’s feedback and help with various alternatives she had.⁶⁹ CMM theory labels the obligatory social forces which Bailey demonstrated as either prefigurative or contextual force.⁷⁰ Characterized as reactionary to some prior event, experience, decision, or action, prefigurative force also could be present when a relationship or connection has failed to materialize in the way one of the parties had hoped. In the Bailey and Dora vignettes, the prefigurative/contextual force pattern recurs over two subepisode groupings, see Table 11, Bailey’s from subepisode groups one-three over Turns 1-13; in Dora’s Subepisodes 1-3 over Turns 1-10. The prefigurative/contextual force pattern and the presence of dimensions of the LUUUUTT, I name as the “struggle patterns.”

The persistence and tenacity of the recurrent prefigurative/contextual force pattern also indicated the presence of uncommunicated background stories that drive behavior and gives rise to an oughtness experience. These stories were made visible in these two student

⁶⁷ Reported from an interview with Tulip.

⁶⁸ See Appendix T3, Bailey’s explanations in turns in Turns 3, 5, 8, and 11.

⁶⁹ Also see Appendix T3, Turn 13.

⁷⁰ See Appendix M2a, Turns 1-13.

episodes by the CMM heuristic of the LUUUUTT.⁷¹ Access to these uncommunicated background stories was gained by the final interviews, and then associated with the texts. The influence of uncommunicated background stories made it difficult for participants to hear feedback, coordinate their actions, and make greater mutual meaning. From CMM analysis, the presence of uncommunicated background stories and the presence of the struggle pattern heightened tensions⁷² and indicated a pattern of communication breakdown.⁷³

Even though Samantha had the lengthiest explanation, it did not result in a breakdown between herself and C4. The pointed, brief critique that Violet made in response to Samantha's first presentation generated a series of appreciative comments as well as mutual builds.⁷⁴ This was perhaps due to the way Samantha framed it and showed incorporation of prior C4 critique.⁷⁵ Wendy (from C4) reported that it seemed as if Samantha began the session having had a breakthrough already as she perceived that Samantha had taken prior C4 suggestions and built them into her design.

Interruptions in struggle patterns led to creative breakthrough emergence. The presence of struggle patterns and the experience of breakdown would logically hinder creative breakthrough emergence. Those struggle patterns would have to be interrupted for critique absorption to begin. These struggle patterns were interrupted by relational moves that changed how the participants could listen to each other in present time for design story

⁷¹ The LUUUUTT model acronym stands for the reflexive relationship between the Story Telling and Stories Told of Untold, Unknown, Unheard, Untellable, Stories; see Chapter 3, p.148. As mentioned before, the influence of unheard and maybe untellable stories Bailey had and C4 had about Bailey could be inferred from the prefigurative/contextual pattern between Turns 1 and 13, visible in Appendix M2a, and the rising tensions visible in Appendix T3 of the same turns, both columns of language content and other communication.

⁷² Observable in T3, Bailey interaction, Turns 1-13, both columns of language action and other communication.

⁷³ A breakdown is an interruption in the forward movement of committed action, and is often accompanied by emotional reactions to that thwarted intention (Denning & Dunham, 2006).

⁷⁴ See Appendix T2, Turn 2/97-102 for the pointed critique and Turns 3-11 for the mutual builds.

⁷⁵ See Appendix T2, Turn 1/lines 3-10.

evolution for the future, as the creative breakthrough emergence followed these relational moves, see Table 11, Subepisodes 3 and 4 for the Dora and Bailey episodes.⁷⁶ Two examples illustrate how the initiator of action demonstrated different listening from the prior sequence of events.

Dora's example showed that to have her design scenarios understood by C4, she needed to hear Tulip's feedback differently. After Dora noticed the confusing effect she had on C4 from her long-winded presentation from Tulip's response in turn seven, she shifted energy and focus from herself to her co-creators, by showing concern for them when she said, "Okay, maybe it would be better represented by a storyboard from only one perspective...confusing when I was trying to explain" (Dora, Turn 8, see Appendix T1). This elicited more connective moves from Tulip towards Dora in Turn 9,⁷⁷ enabling further connection to occur between Violet and Dora in Turn 11. Dora's suggestion shifted the tension.

But Dora did not become free of past-based limits until Turn 11. Limiting background interpretations about Violet's attention and interest in her design were lifted for Dora when Violet acknowledged that she had missed Dora's previous design stories and speculated on what Dora was trying to convey in Turn 11. Violet's relational move allowed her to both connect more fully with Dora, as is evident from the body movements and tonalities used by both participants, and deepen her critique. Dora could relinquish her background doubt that Violet was not paying sufficient attention. Dora could listen to Violet in a new way.

⁷⁶ See Appendix T1, Dora vignette, Turn 8/108-110, Turn 9/111-113, and Turn 11/123, 130-134.

⁷⁷ See Appendix T1, the language content column, Turn 9/111-113.

Likewise Bailey could begin to hear Tulip's critique when Tulip showed in her body and voice in Turn 14⁷⁸ how she appreciated Bailey's prior creative experiments. Tulip made an alternative relational reality for Bailey and all the participants to engage with when she suggested that Bailey's design, "Go opposite of Distinctive Greetings" typical product. When the forces in conversation shift from a prefigurative/contextual back and forth pattern that is anchored in past-based interpretations and assumptions to a more future and forward back and forth conversational pattern of implicative/practical forces, the context shifts and more possibility became available to both sets of participants.⁷⁹ These two successful interruption demonstrations happened to change the direction of the particular subepisodes, but they also led to Dora and Bailey's creative breakthroughs. Dora's breakthrough gave her more connection to C4, as well as more confidence about the general applicability of her design to productive human connections when distance and generation disparity is an issue. Dora then distilled her design story to its essence and future interactions only presented a young boy's scenario. In Bailey's episode, both C4 and Bailey gained more honest connection with each other and made shifts in context and stopped privileging background stories and attachments to what the other should do from Turns 14-22.⁸⁰ Bailey's creative breakthrough came through the permission C4 gave her to challenge the client's brand identity with an edgy design.

Summation of Finding 1. Challenge and critique were necessary for the students and designers to consider other perspectives and more deeply consider the purpose and connective value of their design proposals. Critique and discussion became an opportunity

⁷⁸ See Appendix T3, Turn 14, both the language content and the other communication column for Tulip's full communication and effect on the attendees to it.

⁷⁹ See Appendix M2a, for the contextual shifts and the social force pattern shifts in the Bailey episode between Turns 14-23.

⁸⁰ See Appendix M2a, between Turns 14 and 22, the hierarchy of contexts shifts.

for the whole group to interrupt an individual's initial design logics about her design problem. C4's critiques and discussion would break the presenter's attachment to their initial concepts and redirect the design story evolution. C4 used challenge and critique to expand or extend the design story scenarios and to enlarge the design problem concept and gave permission to the student to take her design and concept beyond her frame of reference. The challenge in the critique also helped to point out where an idea was not connecting, to refine an aspect of the design, and to situate the proposed design into a larger context of future implications in the marketplace that might redefine the client's brand and make Distinctive Greetings more relevant to the younger generation (as Violet pointed out in the Bailey episode in Turn 23).

Tensions and frustrations between the groups were also interrupted so that the substantive design critiques and discussion could be heard. One way that occurred was by C4's use of figurative language, and by changes in how they made relational moves by how they listened to each other. Relational moves and how they facilitated critique absorption are further discussed in Findings 2 and 3.

Finding 2: An Expression of Relationship and Connection from One Participant to Another Was Necessary for the Letting Go of What One "Should" Do and Invited Participants into a Relationship of What They Could Do

Participants made relational moves towards each other that diffused tensions, provided connective bridges, and constructed relational contexts that were conducive to making deeper connections socially as well as creatively, as partially noted above. These relational moves alleviated the sense of obligation and oughtness that participants had from past experiences, anxiety, or role assumptions. A move refers to a loose interactional unit of utterances as Goffman defines "move" (Goffman, 1981, p. 24):

I refer to any full stretch of talk or its substitutes which has a distinctive unitary bearing on some set or other of the circumstance in which participants find themselves (some “game” or other in the peculiar sense employed by Wittgenstein)...It follows that an utterance which is a move in one game may also be a move in another, or be but a part of such other, or contain two or more such others.

According to Linda Blong (2008), a relational move then indicates a language game that helps shape contextual forces between persons (Blong, 2008). These relational language games carry a moral force and show apprehension and a degree of regard being exchanged between persons.

Expressions of relationship and connection. There are as many various expressions of relational moves as there are different relationships, but some specific forms of relational moves relevant to this study include friendly social conversation (e.g., What did you think of the design conference last week?), friendly, warm or appreciative tones, collegiality, expressions of appreciation or validation (e.g., Your drawings are nice), comments that indicate an aspect of work or character that has been seen, expressed concern for another’s viewpoint, and the uses of creative listening⁸¹ and figurative language, specifically metaphors and analogies.⁸² Whenever these occurred in the three student episodes, not only did social connection increase, but the incidence of possibility-based language games increased also. Below I describe and give evidence of how the use of relational moves shifted participants from a sense of oughtness (should) to play in possibility (could). I also give evidence for how the relational moves facilitated creative breakthroughs and end this section with a short summation.

⁸¹ Previously defined and discussed at length in Chapters 1,2, and 3.

⁸² See Table 11, directly above, Subepisodes 3 in the Bailey and Dora vignettes, Subepisodes 2 and 6 in the Samantha vignette for an overview; Appendixes T1-T3 for a more emotional-social rendering in the conversational analysis transcripts.

Descriptions of what one should do. As seen in Finding 1, patterns of oughtness or felt obligation to act a certain way due to sociocultural cues or uncommunicated background stories limited social and creative action. Each participant was dominated by the context of obligation. For the students, it was a “perform a speech or presentation” context at the beginning of each session with C4, which in turn functioned to remove the student from talking with C4. The students said they were either stressed about this (Dora), held back and did not talk much (Samantha), or hung on to what she thought should happen (Bailey). Interviews indicated that for C4, they had a singular role context of feedback and critique, which rigidly cast C4 further into a reactive mode with the students and circumscribed their ability to join quickly with presenters.

Examples of letting go. Relational moves easily shifted contexts of obligation. For example, in Turn 14, Tulip joins with Bailey and appreciatively reminds her of Bailey’s creative experiments as an analogical bridge for Bailey to consider going opposite of Distinctive Greetings’ brand recognition, see Appendix T3, Turn 14/193-197. In her earlier semester experiments, Bailey had found out people did not behave well and did not follow directions. Tulip invited Bailey to consider that Bailey develop a series of hard to say notes that could be given to people as a face-saving measure, for example, “ I hope you stay sick because I can take your desk, or desk chair!” (Tulip, Turn 14). This outrageously occurring series of connective moves in Turn 14⁸³ resulted in shifting the Tulip-Bailey dynamic from what each other thought the other should do by enticing Bailey into something that she could identify as resonant with her former work, views, and sense of herself. Bailey responded

⁸³ The connective moves were, in order as they occurred in Turn 14 in the Bailey interaction, see Appendix T3, Turn 14/193-200, 204-205, 207-21; the appreciative reminder of earlier experiments, maximizing on Bailey’s earlier findings (people don’t behave), suggestion to go opposite, how to do it with nasty notes, socializing the action as a face-saving and perhaps contributory action, to making an impact.

with, “Yeah, I think it would be funny, I think it would be interesting...I don’t know if Distinctive Greetings would appreciate it that much (smiling)?”⁸⁴ Bailey began letting go with this response and fully embraced a new direction and had a creative breakthrough shortly thereafter.⁸⁵

Examples of where participants were invited into what they could do together.

Appreciation and affirmation of a person or aspect of her design concept or story functioned relationally as well as creatively as then they both could push the ideas further. When Tulip made the relational move towards Bailey in Turn 14, it was disjunctive from her more critical tone and comments earlier in the session, and showed a joining with Bailey on what could be possible.⁸⁶ The uplifted mood and energy from Tulip’s appreciative move onward increased the group’s participation and the offering of ideas and modifications to Bailey, see Subepisodes 3 and 4 in Table 11.⁸⁷ It also encouraged and gave more permission to the other students to take creative risk during the presentations to Distinctive Greetings as they reported in reflective interviews.

In the Dora episode, the shift from should to could and a new opening with each other was also evident when Violet validated Dora’s design concept about how a tangible sense of place was important in bridging relationship gaps by her business trip weather analogy story. This and Dora’s earlier relational move in Turn 8 towards C4 when she offered to present her

⁸⁴ See Appendix T3, Turn 15/213-214.

⁸⁵ See Appendix T3, Turn 18/229-232 and Appendix M2a, Turn 18.

⁸⁶ Compare Turn 14/193-200 to Turn 2/64-70 and Turn 6/97-102, and Turn 12/173 in Appendix T3, for Tulip’s shift from critic to joining with Bailey.

⁸⁷ See also Appendix T3, Turn 14/202 both the language content and other communication columns, Lines 196-201 in the other communication column; Turns 15/213-215 in the other communication column, Turn 16/216-219 for Rick’s reaction in the other communication column, Turn 18/229-233 in the other communication column, Turn 20/241-249, Turn 21/250-258, and Turn 23/263-265 in the other communication column.

scenario a different way⁸⁸ transformed the experience of presentation-critique to a more relational context where the interaction was now more talking with C4, not performing for C4. Dora's creative breakthrough of increased connection to C4 and the validation of her design concept ultimately changed her design story and project from how she had been expressing it until this session.

Finally, throughout Samantha's episode there is a liberal use of affirmative acknowledgments towards Samantha, creative listening, and analogies and personal stories that set off a participatory pattern of ideation and idea modification. Free-flowing ideas and suggestions to Samantha's design story and are made between three of the C4 participants throughout the episode which Samantha reported had an infectious effect.⁸⁹ She also reported that without the affirmative critiques and builds she incorporated from this session, she would not have had the breakthrough she had in being able to so well capture serving the potential customer of Distinctive Greetings, as was acknowledged by the company representative in the last week.

Summation of Finding 2. Relational and appreciative moves had multiple impacts as they made new openings (in the Dora vignette), established a participatory pattern of mutual builds (Samantha vignette), and dissolved the breakdown impasse in the Bailey vignette. When either students or C4 made a relational move, shifts in context and the logics of social action would provide a focus on what could be possible, thereby creating a new contextual force amongst participants.⁹⁰ When figurative language was used, a creative energy mood followed. The essence of the relational move that made a difference to

⁸⁸ Turn 8/108-110 in Appendix T1 and Table 11 for the overview of the shifts.

⁸⁹ See Appendix T2, Turns 3-11, Turns 19-27, and Turns 29-30.

⁹⁰ Noted in Table 11, in Subepisodes 3 in Bailey and Samantha vignettes, Subepisodes 4 and 6 in the Samantha vignette by the presence of the CMM implicative/practical force pattern and visible in Appendixes M2a-c.

creativity was that it represented a reaching out to recognize a unique aspect or impact of the other's point of view, which in turn then allowed both persons and the group to incorporate other points of view and push the ideas further. The patterns of impact from the relational moves were made evident by a combination of conversational analysis, CMM heuristics and the use of figurative language.

Finding 3: The Evolvement of Creative Breakthrough Experience Pivoted on Participants Taking Responsibility for How Their Choices Affected Others

A dimension of communicative responsibility and choice is displayed when a person shows awareness to how their response to a previous comment may affect the others present in a dialogue. Bailey, Dora, Samantha, and C4 demonstrated conversational choices that changed the direction of the immediate dialogue and the sequences of interaction that followed. These conversational choices have an in-process aspect as well as outcome aspect. In process, these choice points can be random, or made with awareness that what I do, or what you do by what we are saying will or could be critical for how something will develop afterwards. As an outcome, these critical moments are recognized as fateful, for one can reflect that having done "this" instead of "that" made all the difference to the evolvement of a project, meeting, decision, relationship, self-identity, etc. Pearce (2007) termed these critical moments' bifurcation points, where an utterance changed the trajectory and afterlife of a social world that was under conversational construction between people in communication (Pearce, 2007; p. x; p. 5).

The presence of a bifurcation point meant an opportunity for a changed trajectory was taken, launching something for good or for ill. CMM analysis revealed that a pattern of bifurcation points partially established creative breakthrough emergence. From the interview data, Bailey, Tulip, Dora, and Samantha also revealed they were aware that in making these

choices, they were taking responsibility for a larger social context than they had been in the immediate previous sequences of their particular interactions. I give examples of these responsibility moves and changed trajectories from each of the vignettes below.

Responsibility moves and changed trajectories. The Dora and Bailey sequences leading up to the midpoint of the sessions were fraught with tension, frustration, and misconnection.⁹¹ When Dora offered to present her design story differently in Turn 8, Dora changed the trajectory of the conversational pattern that had been enacted. Her concern for making her story easier to understand for C4 was a relationally responsible choice that opened the opportunity then for C4 to make relational moves that would socially and creatively connect more deeply to Dora and her design story. Immediately, in Turn 9, Tulip responded:

That might be nice and your drawings are really nice and it feels like something is there, but maybe “Embrace like the experience of the consumer,” and don’t talk about the system, because it is confusing right now, without understanding the experience right now. (Tulip)

The first clause of Tulip’s response is an appreciative, affirmative relational move. The second clause is the critique, given with context so that Dora could make an informed choice if she chooses to incorporate the critique. Violet deepened Tulip’s relational move then immediately afterwards by taking responsibility for not understanding Dora’s design fully because of her absences in the next turn,

Maybe it is because I have missed a lot of the background of this, but what would help me to better understand what the big idea of this in words because a gap [exists] between your brother’s age and your age. (Violet)

Violet validated Dora’s design concept with a business trip weather analogy story that illustrated how essential it is for people to have something tangible to talk about when they

⁹¹ As I have outlined above.

live in separate worlds. Dora's response showed her creative breakthrough is one of connection and relationship in her response to Violet, see Turn 12/140-147 both language content and other communication columns, Appendix T1. Dora reported in the interview it was this sequence that allowed her design to come together. The sequence above showed that relational and responsibility moves made closely in tandem built upon each other and allowed Dora to exclaim, "That's right on" in Turn 12. Dora could then experience that her design problem and story was seen and heard by C4 as relevant and important. She reported that when Professor Robinson was interacting with C4 in Turn 13, it allowed her to incorporate C4's critiques and experience them a new way so as to hone her design story and design; see Table 11, Subepisodes 3 and 4.⁹² Graphically, the relational-responsibility could be depicted in Figure 7, Relational Responsibility Build, below:

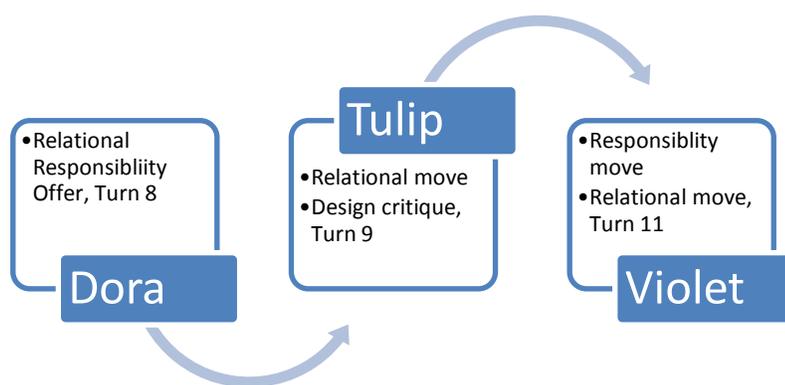


Figure 7. Relational responsibility build.

⁹² See also Appendix T1, Turn 13/148-170 for the length of the respite that Dora experienced to reflect.

In the Bailey vignette, C4 tried three critiques that Bailey did not accept or even seem to hear, as they had been made in a context of what Bailey should do as a design student.⁹³ Midpoint in the session, Tulip made a relational move by acknowledging Bailey's former work and made a suggestion to go opposite of Distinctive Greetings brand identity with a specific product idea.⁹⁴ This move could also be said to be a relational responsibility move because of an added dimension. This helped to shift the interaction trajectory in a new, positive direction.

In conjunction with this move, Tulip shifted her stance from critic and joined with Bailey to consider the suggestion made, to discuss it, to play with it and invite Bailey into that frame.⁹⁵ To do that, Tulip said in an interview that she recognized what she had been doing was not working and she had do something different that would stop the semester long "going-in- circles pattern we had been in with Bailey" (Tulip) and make progress. Another way to say that is she took responsibility for what she had been doing as ineffective and made a wiser choice: This was a bifurcation point of Tulip's.⁹⁶ Although she later thought her suggestion of going opposite from Distinctive Greetings was "cheating, as I gave her the answer" (Tulip), she did give Bailey the opportunity to choose to go in that direction or not. Although Bailey did not immediately choose to go in that direction, this relational and responsibility move of Tulip's shifted the trajectory of the entire episode and what Bailey ultimately produced.⁹⁷

⁹³ Discernible through the interview data and the CMM heuristic of the LUUUUTT and applied to the language content of the vignette, Turns 2,6,and 12 specifically in Appendix T3, and see Table 11, Subepisode 2.

⁹⁴ See Appendix T3, Turn 14/193-200.

⁹⁵ See Appendix T3, Turn 14/207-212, but the whole turn, both columns for the full affective dimensions. Also see aspects of the other methodologies used in Table 11, Subepisode 3.

⁹⁶ See Appendix M2a, Turn 14 for the first bifurcation point evidence.

⁹⁷ Note the implicative/contextual force pattern in Appendix M2a that emerged and continued between Turns 14 and 18, the three various bifurcation points (first by Tulip, then by Bailey in Turn 16, and again by Bailey in

Shifting a stance occurred differently for Bailey; instead of jumping for an answer, or resisting, Bailey demonstrated choice and ownership after consideration. Bailey's first responsibility move was to play with Tulip's suggestion notion in response to Rick with "evil Distinctive Greetings" as a try-on of the idea in Turn 16, and then a short while later, she showed she would take it on by thinking aloud how it could work with some of her initial ideas and articulated the transformation of it as "random acts of truth" in Turn 18, see Appendix T3. These were Bailey's bifurcation points, as well as her creative breakthrough in Turn 18.⁹⁸

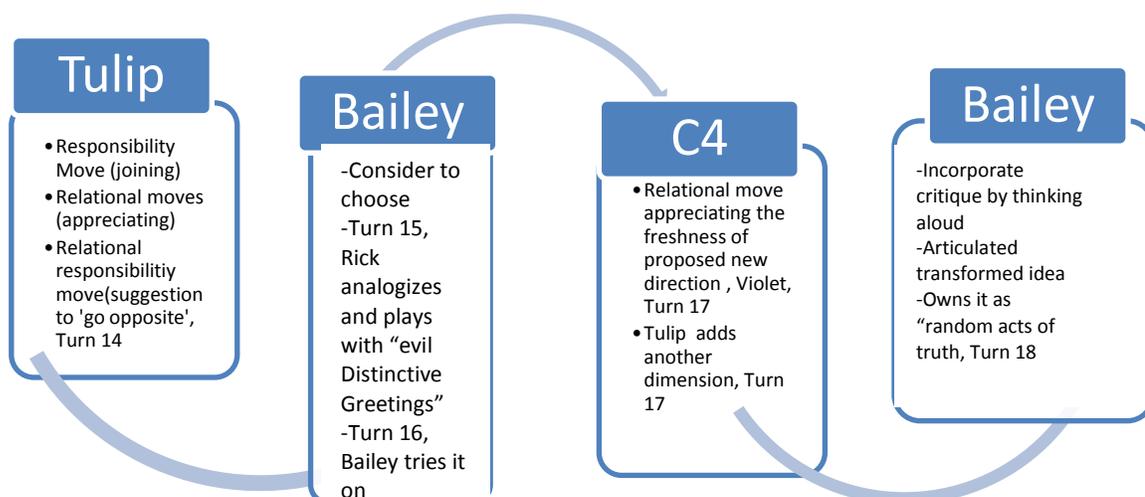


Figure 8. Relational and responsibility moves facilitated critique incorporation and ownership.

Turn 18) for the emergence and ownership of her changed design problem and creative breakthrough, and the practical force pattern for implementation from Turns 19-23.

⁹⁸ See Appendix T3, Turns 16-18 and Appendix M2a, Turn 16 and 18.

These were not the only dynamics that were present in this vignette from Turn 14 to Turn 18, as Table 11 shows in Subepisode 3, however, the trajectory change was dramatic and not stretched over many turns compared to the earlier struggle pattern which encompassed 13 turns (Table 1, Subepisodes 1 and 2).

Samantha's bifurcation points came at midpoint in her episode when she demonstrated creative listening as revealed later by interview data, and near the end when she corrected herself to C4 by incorporating prior critique made in a previous session as she suddenly saw the relevance and importance of how emotional infographics or avatars would be to the newer evolved design story focused on the client's customer, and not on the technical aspects of a medical interface.⁹⁹ Midpoint in Samantha's interaction, C4 and Professor Robinson got into a testy interaction about an aspect of Samantha's design. Samantha said she listened to that interaction in a way that deepened and permanently shifted her stance as a designer, and what a designer is responsible for with her designs. Earlier in the session she had been following C4's building and expanding on critiques and alternative suggestions of her design story with agreement. Yet when she heard Tulip's sharp response to Robinson that the design story for the customer was more important than how the product worked technically, she reported that she let go of previous worry about how to design every last bit. She said she suddenly saw that the true mechanism for designing and a designer was how it affected the client's customers' lives. This choice then led to her spontaneous self-correction eight turns later about how she could empower the client's customer to tell her own life-affirming story, and launched a series of mutual builds and recombination's that

⁹⁹ This prior critique incorporation is about the importance of emotional infographics, or avatars, which Samantha acknowledged in Turn 22/219-227 and she ties it to the design story shifting from a medical slant to a consumer slant, see Appendix T2.

Samantha incorporated into her creative breakthrough. Without these moments, Samantha said her design just not would have evolved so well.

Summation of Finding 3. Responsibility moves and bifurcation points are expressed differently but are closely associated with providing a new, more possible direction for people in creative collaborations. Creative breakthroughs were facilitated by relational moves of responsibility between participants and launched different creative trajectories for each presenter. CMM analysis also revealed that in conjunction with the bifurcation point pattern,¹⁰⁰ there was also an interactional logics shift from previous sequences reactive and obligatory in nature,¹⁰¹ to a pattern of more possibility and forward action conversation across the vignettes (e.g., the implicative/practical force pattern, for an overview of when that occurred, see Table 11). This pattern meant that the conversational sequences changed, with more creative associations made between participants. The presence of both of these patterns showed that for creative breakthroughs, interdependency between the social aspects of relational and forwarding moves was needed.

Finding 4: Creative Breakthroughs Were Produced in the Group’s Co-evolution of the Design Story That Ultimately Resulted in a Product Design Concept

The designers were faced with an open ended brief to generate a communication product for Distinctive Greetings that could appeal to younger potential customers who wanted to bridge relationship fissures. Each student generated her or his own particular relationship---design problem. Therefore, a narrative or a design story had to be developed contiguous with developing the design solutions to the relationship dilemma. The students

¹⁰⁰ See Appendixes M2a-c for the bifurcation point patterns in each vignette, and Table 11 to note where they occurred per subepisode in each vignette.

¹⁰¹ The prefigurative/contextual force pattern already mentioned and cited in the evidence see Table 11 for an overview.

needed to imagine compelling customer-based scenarios for their proposed design solutions that the client, Distinctive Greetings could find plausible and marketable.

In the process of coevolving the scenarios of the design story for the imagined customer, critique offered in figurative language helped the mutual building of the design story as well as shaping the design solutions. Figurative language is defined in this study as the use of metaphors, analogies, and improvisational verb usage.¹⁰² Other examples of figurative language use could also include anthropomorphism, personification, and similes. While this happened in each creative vignette, I will highlight the figurative language aspect in the mutual build patterns from Bailey's vignette. In each of the vignettes this figurative usage pattern was confirmed by patterns of increased pacing, lightness of mood, and emotional involvement as seen by CA analysis and the shifting of social forces from reactive patterns to possibility patterns traceable with CMM analysis, see Table 11 for the subepisode groupings in which they occurred.

How figurative language use helped the design story. Tulip's analogical use of bad behavior in Turn 14 gave Bailey permission to consider pushing the client's boundaries as well as her own. At this point in the vignette, Tulip reminded Bailey of her earlier semester experiments when she found that people would rather break the rules than follow them. Tulip posits a possible scenario where a customer might want to say to a co-worker, "I hope you stay sick because I can take your desk, or your desk chair" in a parallelism encouragement to Bailey to consider this design story and to "enable those people that rip down posters" (Tulip, Turn 14/199-200 and Lines 211-212 respectively, in Appendix T3). In other words, there is a market for straight talk though not directly to someone's face.

¹⁰² These definitions are available in Chapters 1 and 3 on p. 19 and p. 151, respectively.

This use of figurative language launched a series of scenario and design solution mutual builds that also used figurative language and enabled Bailey to incorporate Tulip's critique and Violet's suggestion in turn 17/224-226 (see Appendix T3) that could capture the younger generation's penchant for being real, yet doing so indirectly. Not only are the design story and solutions developed in figurative language several turns thereafter, but the need for a new metastory of Distinctive Greetings' identity is also developed as part of the impact Bailey's product design could have, which enlarged Bailey's design problem (all of these examples are found in Appendix T3):

“Evil Distinctive Greetings” (Rick; anthropomorphism, Turn 16)

“Distinctive Greetings has suffered from being too tea partyingly sweet” (Violet; metaphor, Turn 17/223-225)

“Distinctive Greetings for friends” (Tulip: personification, Turn 17/227)

“Cause then they don't have to be bad” (Tulip: analogy, Turn 19/234)

“Distinctive Greetings can come [into a bad situation], where there is no social structure for [and say] here is a nice way to say something” (Rick: metaphor, Turn 20/245-246)¹⁰³

Thereafter, the design solutions for the kind of nasty notes that could be made are offered in playful juxtapositions and in mutual builds between one participant and another, with just two examples here:

“I mean, you can do a whole story on how we've gone from June Cleaver to Cosby to Modern Family, the reason why that's funny is that they are human and they do mean things to each other” (Violet: Turn 21/250-252)

“And maybe you could go back to something said earlier that introverts would love, ‘I'm deleting you from my FB feed and don't bother talking to me...you can come up with some awesome ones’” (Tulip: Turn 21/254-258)

Bailey used an analogy herself to make the commitment to incorporate Tulip's critique and analogy when she said, “It would be just like random acts of kindness, random acts of rudeness, weirdness, like random acts of truth” (Bailey: analogy, Turn 18/230-233).

¹⁰³ See also Appendix T3 to get the full textual and social-affective dimension of this, as well as Appendix M2a to see it represented in a conversational map.

How the design story resulted in a product design concept. By this articulation, Bailey totally shifted her original design problem and then could begin to envision her ultimate creative breakthrough product design, “Truth be Told.” The scenarios of what could happen in different situations that the group bandied back and forth enabled Bailey to propose a set of pre-printed cards with space for a user’s customization in “Truth be Told” cards that one could pass out to communicate in uncomfortable social situations that would help the recipient. The figurative language scenario development from Turns 14-18 helped Bailey and the group to quickly generate various design solutions from Turns 19-28. Rick remarked later in an interview that once the design problem scenario building occurred, it was notable how quickly the whole group generated the design solutions.

This figurative language and playful juxtaposition mutual build pattern between the design story and the design solution with an enlargement of the student’s concept on how she was serving the client, and not just the customer was also evident in Samantha’s vignette. C4 built scenario’s for Samantha’s imaginary, diabetic customer Karen in Turns 4-11, Samantha’s realization that her focus needed to be the design story on the customer in Turns 14-18. Samantha’s focus enlarged even more in Turns 19-21 when her focus shifted to how her potential design could widen Distinctive Greetings’ potential suite of services to their potential customers by including a consumer health component, see Appendix T2. Finally in Turns 22-27 Samantha and the group in a figurative language playful back and forth further developed avatars for Samantha’s design, which became a key feature of the total concept.¹⁰⁴

Summation of Finding 4. The design creation was a co-evolvement between the persistent generation of a compelling design story that could make sense for the clients’

¹⁰⁴ See Table 11 for an overview of this development.

customer and breakthroughs in the designer's self-concept and overall practical design practice.

To accomplish a focus on the client's customer and elevate the design story and concept, critique offered in figurative language and playful juxtaposition helped the student build further. When the students could link how their design stories and concepts could serve the client's customers, their focus enlarged and they surprised themselves with how far their design could push the client's boundaries and serve the client.

Finding 5: Group Idea Modification and Ideation With C4 Facilitated Creative Breakthroughs, but With the Whole Group Ideation Occurred Only AFTER the Group Saw the Presenter Incorporate the C4 Critique

Group participation was crucial for critique incorporation and creative breakthrough emergence in the Bailey and Samantha vignettes. Two patterns of group idea modification in the form of mutual builds, idea recombination, and newly offered ideas stand out in this study. The first pattern was "C4 group idea modification exchanges"¹⁰⁵ that propelled the emergence of the creative breakthrough. Propellant patterns had the effect of transforming the design problem, or causing contextual shifts and energy shifts¹⁰⁶ that significantly changed the presenters' perspectives. Group idea modifications, idea recombination suggestions, and bits of related domain knowledge or research study data were liberally offered by C4 to the students in these exchanges. In the Bailey vignette, Rick's idea modifications and the university group's generosity of listening were also contributed. The effects of the mutual builds between C4 and the students were further documented by the

¹⁰⁵ I am using "C4 group idea modification exchanges" as a modified noun.

¹⁰⁶ For transforming a design problem, Bailey's stands out, see Appendix T3, Turns 14-22 and M2a for the contextual shifts and social force pattern shifts; Samantha's design problem shifts had more to do with who and how she was targeting her design, see Appendix M2c Samantha's hierarchy of contextual shifts between Turns 6-8 to 13-21, then Turns 19-21 to Turns 22-27. See M2b for Dora's contextual shifts in the second layer of context between Turns 1-2 and 6-8, then to Turns 12-16. Changes from prefigurative/contextual social force patterns also shift to implicative/practical along with these contextual shifts for both Dora and Samantha.

contextual shifts and logical force shift patterns already mentioned above in Findings 1 through 4 from CMM analyses in the Bailey and Samantha vignettes.¹⁰⁷ This may have been because the central focus of each session was on the interaction between C4 and the particular presenters.

The second pattern of group idea modification involved comments, questions, and ideas that were offered as additions to the newly emergent design story or concept. These additive comments were often made by the university group to the presenter. From the interviews, all of the students noted that they refrained from adding their ideas to the presenter-C4 dialogue until after they sensed that the presenter had incorporated the critiques and comments from C4. They thought this action was more respectful to the presenter in having the full opportunity of interaction with C4, and did not clarify how they knew when the student presenter was incorporating the critique. Yet CMM analysis of the contextual shifts and social force patterns indicate that they may have known because the energy and direction of the conversation had a more open and possibility-tinged characteristic. University group modifications made to the design after the critique incorporation therefore usually occurred after the midpoint of the vignette, and were additive, and not a propellant of the creative breakthrough emergence.

Group idea modification and ideation that propelled creative breakthroughs. A propellant pattern of group ideation and idea modification was evident when the modifying ideas were made to tease out and develop the core critique(s). The pattern that propelled creative breakthrough emergence showed an inter-relationship of critique, mutual builds, contextual shifts and the emergence of more open and possibility oriented social forces made

¹⁰⁷ See Table 11, the Bailey and Samantha vignettes.

evident by the texts and CA and CMM analyses, see Table 11, Samantha Subepisode 3 and Bailey Subepisode 4.

This occurred three times in the Samantha episode: First, C4 said they riffed¹⁰⁸ the scenario development of Samantha's imaginary character after Violet's first direct critique about the design story in Turn 2.¹⁰⁹ The second time C4 built on the possible capture and display functionalities of Samantha's design concept to further establish what this design can do,¹¹⁰ and for what kind of customers. Last, in response to Samantha's self-critique, Bailey, Rick, Tulip and Violet built on her flower avatar idea,¹¹¹ that would make a consumer application of her concept very appealing. These suggestions and ideas helped Samantha's design concept and overall breakthrough emerge as well as shift her idea of how her design concept could help Distinctive Greetings.

Critique incorporation and whole group idea modification pattern that was additive. While C4 also launched a similar propellant pattern of group idea modification and builds after Turn 14¹¹² in the Bailey vignette, the additive pattern was evident after Bailey authored the critique and development of a new direction for her design concept when she said "random acts of truth" in Turn 18.¹¹³ Implicative force was present in the propellant pattern between Turns 14 and 18, but the force pattern turned to practical force about how the

¹⁰⁸ Improvisationally built upon the idea suggestions by adding elements or contributing information to the conversation.

¹⁰⁹ See Appendix T2, Turns 3/108, 4/109, 5/110-117, Turn 6 (Samantha nods yes, writing, with eye contact to Wendy), Turn 7/121-124 where Violet raises regulatory concerns on medical pumps, Turn 9/128-130 where Wendy offers another possibility on food allegories, and expanded upon it in Turn 10/133-137, Turn 11/140-141.

¹¹⁰ See Appendix T2, Turns 16-21. Violet's distinction between a medically driven product and a consumer product in Turn 19/197-201 impacted the development of Samantha's design from Turn 22 to Turn 31, see Appendix M2c for the emergence of breakthroughs and the implicative/practical force pattern.

¹¹¹ See Appendix T2, Turns 23-27 and 30.

¹¹² See Appendix T3, Turns 14-28 and Appendix M2a, the same turns.

¹¹³ See Appendix T3, Turns 19-22, and Appendix M2a, those same turns.

new idea could be implemented in the additive pattern between Turns 19-24.¹¹⁴ From the interview data, Rick remarked how fast the implementation pathway of Bailey's idea evolved after it was clear she said her project would be random acts of truth.¹¹⁵ Tulip, Rick, Bailey, Violet, and Professor Robinson added comments that further fleshed out how this new iteration of Bailey's idea could be developed and the kinds of social situations for which it could apply.¹¹⁶ CMM social force pattern analysis showed that the propellant pattern was one of implicative and practical forces whereas the additive pattern happened after an implicative force change and showed a contextual force/practical force orientation, using the new shifted context, as in the examples above.

Summation of Finding 5. Both the propellant and the additive patterns of mutual builds, idea modification, idea recombination, and suggested new ideas helped the students evolve their design stories and design concepts. The propellant pattern had within it contextual shifts changes and implicative social forces whereas the additive pattern indicated that the presenter and participants placed more emphasis in the design concept's implementation. Only the propellant pattern that indicated shifted contexts and implicative social forces were significant for facilitating creative breakthroughs. In this study, that happened more with the presence of design experts (C4 participants) and pivotal critiques than it did with the C4 and university groups combined.

¹¹⁴ See Appendix M2a, Turns 14-18 for the presence of implicative force and Turns 19-21 for the practical force pattern.

¹¹⁵ See Appendix M2a, Turns 19-24, with people often talking over one another, see Turns 20, 21, and 23.

¹¹⁶ See Appendix M2a, Turns 22-24, and how Tulip, Violet and Ned talked over one another in Turn 23.

Finding 6: The Students Incorporated and Reframed Critiques and then Authored and Named Their Creative Breakthroughs

In order to make C4's critiques useful for their design concepts, the students had to understand and reframe them so authentic authorship could occur. An indication that the students transformed C4's critique was when they articulated their design concept in a new way. These articulations showed the pivotal moment when the student had incorporated the critiques and ideas generated and authored the creative breakthrough. From the findings described above, letting go and the emergence of something was facilitated by critique and mutual build incorporation. The specific patterns that supported incorporation and the student's reframing of ideas so she experienced authoring the new direction included shifting interactions of tension and frustration to new directions, relational moves, responsibility moves and bifurcation points, and figurative language use. Yet it was not until the student said the reframed idea that the creative breakthrough was confirmed. Below I will highlight the student's creative breakthrough articulation and process of authorship.

Process of incorporation and reframing. Although Dora and Bailey's processes of critique incorporation and reframing were facilitated by relational, responsible, and figurative language moves,¹¹⁷ how they each did it differed from one another.¹¹⁸ After Dora acknowledged her confusing effect on C4,¹¹⁹ she began her critique incorporation and reframed the relationship focus into her project design almost immediately when she confirmed Violet's interpretation of her project in Turn 12/142-147.¹²⁰ Bailey's incorporation took more consideration. Violet's comments and demeanor towards Dora in

¹¹⁷ See Table 11 above in this chapter, for an overview, with particular attention to Subepisode 3 for Dora and Bailey.

¹¹⁸ See Turns 14-18 in the Bailey CA transcript, Appendix T3 and Turns 8-12 in the Dora CA transcript.

¹¹⁹ See Appendix T1, Turn 8/110.

¹²⁰ See Appendix T1, Turn 12.

Turn 11 enabled Dora to reshape her past-based conclusions about Violet's interest and attention to her design,¹²¹ established enough connection with Violet to listen more fully, and used Violet's weather analogy story as a way to make her personal experience applicable to a wider world since Violet noted that people needed a common, physical experience with which to begin building a relationship.¹²² Dora could then follow Violet's lead in how to say the design story and only talk about what would matter to Distinctive Greetings potential customer. CMM analysis of the social forces and contextual shifts confirmed that Dora did not take a lot of time to let go, to incorporate, or to reframe from how Violet attended to her design.¹²³

In the first half of the Bailey vignette, Bailey had established a pattern of critique indigestion.¹²⁴ Tulip's relational, responsible, and figurative move midpoint in the episode created a new opening with Bailey in Turn 14. Even after that, Bailey did not own the critique and the suggestion right away. Her first response to Tulip was "I think it would be funny, I think it would be interesting, I don't [know] if Distinctive Greetings would appreciate it that much?"¹²⁵ She had to work the idea to reframe it in the commitment she had to random social acts,¹²⁶ let go of how she was conceiving this to happen, and consider the implications of that reframe¹²⁷ in order to transform and own her design problem.

¹²¹ From the final interview, Dora had said she wondered about how much true attention Violet could pay given she was not always in attendance, was eating lunch, and it was difficult to really gauge reactions during interaction through Adobe Connect. This data led to my application of the LUUUUTT, specifically, the unheard, untold and untellable stories.

¹²² See Appendix T1, Turn 11/123-134 both the language content and other communication columns.

¹²³ See Appendix M2b, Dora's CMM complex conversational map for a full view of the reflexive language action and meaning-making shifts of these heuristics in play.

¹²⁴ As previously discussed, C4 tries to penetrate Bailey's preconception of getting the answer on her presentation several times and does not gain entry until Turn 14, See Appendix T3.

¹²⁵ See Appendix T3, Turn 15.

¹²⁶ See Appendix T3, Turn 15/213-215, Turn 16/218, Turn 18/229-233 for the graduated way in which Bailey worked the critique suggestion to go opposite of Distinctive Greetings into her original mental framework.

¹²⁷ The consideration of the social implications of such a design change are in Bailey's graduated articulation in Turn 18/229 when she said it perhaps should not be so much about connecting with strangers, but the focus of

Maybe it shouldn't be so much about connecting with strangers (her former idea of random social acts), maybe it should be just like, could be just like, I mean, it's like random acts of kindness (her former idea), oh, not so much, random acts of rudeness, weirdness, sort of really state your mind, and like random acts of truth. (Bailey, Turn 18)

CA analysis of the interrelationships between the body movements and tonalities used with the text¹²⁸ as well as CMM analysis in the serpentine heuristic and social forces showed that she took Tulip's Turn 14 critique and the subsequent mutual builds bit by bit.¹²⁹

She then began generating design solutions to the reframed and transformed design problem, see Appendix T3 for these turns:

Like when someone parks really badly, taking up two spots, or some Larry David stuff, "Curb Your Enthusiasm" stuff (Bailey, Turn 20)

(Rick suggests different social scenarios where these cards could be used, Violet and Tulip do as well)

I really want to print something out and that people can give throughout the day, around the office (at the Distinctive Greeting presentation the following Tuesday in Boston), and whether I leave them out, as we're toying around. (Bailey, Turn 22)

The group and Bailey were fueled in their design solution generation by the larger implications that Bailey's new design problem could have for Distinctive Greetings as well as the permission Violet inferred in Turn 17/223-226, Appendix T3, when she said "I think Distinctive Greetings has suffered from being too tea-partyingly sweet for all these years and like there's a new generation of people, and part of expressing yourself is actually saying what's on your mind instead of pretending to like people" (Violet).

Samantha's absorption and reframing of critique and mutual builds happened in four phases. In the first phase, C4 thought that by how Samantha presented her design she had

the connection could be the surprise element (Lines 232-233), or "rudeness, weirdness...sort of really state your mind...and like random acts of truth". The later interview also confirmed it was at this point where she thought about the implications.

¹²⁸ See Appendix T3, Turn 14/193-2013, both the language content and other language columns.

¹²⁹ See Appendix M2a, Turns 14-18.

already had a breakthrough and became excited to refine it.¹³⁰ Their critiques to her in Turns 4 through 12 centered on the order in which she was telling and creating a scenario for Samantha's imaginary diabetic character of Karen.¹³¹ They suggested making Karen more believable, relatable, and self-revelatory as she used Samantha's proposed design product. Samantha showed ingestion of the C4 mutual builds and critiques made in Turns 4 through 12 by four verbal assents, usually "okay" as she took notes.¹³² Interview data revealed that when Tulip responded to Professor Robinson's question with a sarcastic edge in Turn 14, Samantha heard the big critique to have attention on your client's customer.¹³³ She incorporated this silently, but with much note taking. The theme of what a consumer-products based Distinctive Greetings could most powerfully do for the imaginary Karen and her medical condition became a third phase of mutual builds between Violet and Tulip in Turns 19-21.¹³⁴ Samantha then shows in Turn 22 that she is shifting the direction of her design project from bridging a relationship gap between Karen and her doctor to empowering Karen to have information from Distinctive Greetings to make her own best health choices when she said, "I was very focused towards the medical and not focused on your everyday person...but that is not important now" (Samantha, Turn 22, Appendix T2). Her comment in Turn 28 also recapped what she got from the scenario creation and avatar conversations, and then launched another series of mutual builds of how Karen the potential customer might show how she is feeling using Samantha's design product:

¹³⁰ Wendy specifically mentioned in her interview that Samantha occurred to her as if her breakthrough had already occurred when she began presenting in Turn 1. See Appendix T2 Turns 2-12 for the mounting excitement in the pacing of the language content and the other communication column indications of emotion.

¹³¹ See Samantha's CA transcript, Appendix T2, and for an overview see Table 11 in this Chapter.

¹³² See Appendix T2, Turns 2/106-107, 6/119-120, 8/127, and 12/143.

¹³³ See Appendix T2, Turn 14/157 where Tulip emphasized that the point of Samantha's design was the service of reaching out to the customer's device, not the form of the device.

¹³⁴ See Appendix T2, Turns 19-21, most notably the use of the word "another" in Turns 18 and then Turn 20, and then more variations from other products or news services in Turns 20 and 21.

I think with tying Distinctive Greetings with all this too, and how the scenarios are really creating such a story, and I think with the avatars bringing the emotional side into it, which you guys have repeatedly said, I think umm better attracts. (Samantha, Turn 28, Appendix T2)

Samantha expanded her contextual grasp of relating to the client and their customer when she self-corrected about her info-graphic ideas and demonstrated that she had incorporated C4's previous critiques.¹³⁵ Yet, while this recap showed a reframing of her project, Samantha did not close the mutual building pattern, as C4 continued for another two turns.

Authorship and naming of creative breakthroughs. In each of these vignettes the groups' participation and alignment with the critiques and mutual build ideas helped the presenters to fully own their designs in a new way.¹³⁶ Yet, the naming of the new direction, or creative breakthrough marked the moment when the presenter's authorship anchored its creation, and implementation could begin. Ever polite, Samantha listened to C4 in those last two turns before she showed her authorship of her total creative breakthrough when she named what she will propose Distinctive Greetings do with her design concept in Turn 31, "Helping people be their best" (Samantha). When the final presentation did happen, Samantha named her project, "Live Your Best Life."

Dora's reframe and creative breakthrough articulation was in relieved and pleased tones that confirmed Violet's suggestion when she said, "That is right on because travel is an aspect of my relationship with my half-brother so places where we are when we are apart have a lot to do with what we have to talk about when we are together." (Dora, see Appendix

¹³⁵ See Appendix T2, Turn 28/250-253, specifically, "bringing the emotional side into it, which you guys have repeatedly said, I think umm better attracts"

¹³⁶ The emotional-affective reflexivity between the presenters and C4 in the incorporation and ownership involvement was made evident by the CA analysis and the CMM analysis, see Table 11 in this chapter as well as Appendices T1-T3 and M2a-c. The conclusion I make here however, is a synthesis between those streams of analysis.

T1, Turn 12). Her final presentation name for her design was “Lascaux Cube.” Bailey’s authorship is evident when she said random acts of truth, with the final project name as “Truth be Told.”

Summation of Finding 6. One of the important specific conversational condition patterns for the emergence and experience of creative breakthroughs in the process of design was the incorporation, reframing, authorship and naming pattern of critiques and mutual idea builds. Critiques were better incorporated with figurative language use (Bailey, Dora vignettes) which then facilitated the creative breakthrough recognition for the design. Responsibility choices (bifurcation points) were made either prior to or contiguous with emergence of breakthroughs. Each student was anxious and ready to begin the next steps after she authored her breakthrough in her own idiom.

Summary of the Overall Pattern for the Facilitation of Creative Breakthroughs in Collaborative Workgroups

In answer to the research question, creative breakthroughs were facilitated by six specific conversational conditions between two different groups of designers in communication product design collaboration. Although the general contextual and conversational conditions were found not to be conducive for the experience and ease of the collaboration, the two groups managed to have conversations such that creative breakthroughs evolved in their product design process anyway. Conversational patterns of perspective interruption, letting go of former beliefs and ideas, relationship and connection, awareness and responsibility for how choices affected others, group idea modification, and critique incorporation and authorship were shown to facilitate creative breakthroughs in this study.

At least two, if not three of the analytical frameworks used to examine the data and the texts validated each of the patterns noted in the findings, and visible in Table 11. What is also important and meaningful about these specific conversational conditions is that five out of the six of them happened in each of the creative vignettes. Finding 5, the conversational condition of group idea modification with the whole group did not occur in Dora's episode, although C4 idea modification and ideation did.

The Distinctive Greetings Project was conducted in improvisational dialogue, even though the roles of C4 and the Levenger students seemed uncomfortably fixed. The process of their dialogues was reiterative, and looking at them as a whole, all the conversational conditions noted to facilitate creative breakthroughs were involved and in a holistic, reflexive process of improvisational meaning-making and action, even though each vignette played out differently. Because the conversational conditions held across all three vignettes, the findings suggest a minimal improvisational conversational structure for creative breakthrough emergence in collaborative workgroups. Table 12 summarizes an overview of the patterns discerned in the discussion above.

Table 12

Improvisational Conversational Structure for Creative Breakthrough Emergence: An Overview of the Distinctive Patterns That Emerged Using the Improvisational Language Nodes

| Creative breakthrough emergence per vignette | | | |
|---|--|--|--|
| Conversational nodes /Language tools | Bailey | Dora | Samantha |
| 1. Interruptive critique | Critique-Confront/resist in BD pattern | Misconnection, confusion, attempts to clarify | Connection, critique, idea recombination |
| 2. Relational moves & letting go | Appreciation moves by C4 to Bailey | Appreciation of her presentation's effect | Appreciation moves and mutual builds |
| 3. Responsibility moves for mutual experience | Direct suggestion made in analogy to 'go opposite' enabled group letting go; Bailey begins to reconsider | Direct offer made to change scenarios showed letting go | Indirect impact from witness and reflection during others' interaction enabled letting go of previous design problem construct |
| 4. Design story & design solution co-evolved | Group appreciates and plays with 'go opposite' suggestion. Bailey lets go, considers, reframes design problem | Metaphor offered and confirmed | Acknowledgment and self-correction using previous critique |
| 5. Group idea modification & ideation with C4 facilitated (Table 12, cont.) breakthroughs; with whole group idea modification was additive | Group joins with C4 & builds design problem/design story. Whole group builds design solutions. | Reflection and incorporation of critique and Violet's analogy while others interact (Professor and C4) | Group shifts perspective on client and use, prompting Samantha to change her design problem from medical to consumer focus |
| 6. Students incorporated & reframed critiques & then authored their creative breakthroughs | Transformed and reframed critique/suggestion as "random acts of truth" as design problem and generates design solutions with others' participation | Changed her design story scenarios | Accepting reflection, self-correction, then named new focus: "Helping people be their best." |

As a minimal structure, the conversational conditions discerned as the findings from this study could be considered as conversational “nodes” or language tools that when engaged help facilitate creative breakthrough. A node also has social, affective, and cognitive implications even though a node, such as interruptive critique for instance, might privilege one of those aspects more than another depending on the contexts accessed and the situation. When in use, the node or language tool might be to emphasize one or more of those aspects. The language tools are not prescriptive, for as the difference creative breakthrough emergence patterns across the vignettes show, situational variety and unique expression can be encompassed with a particular node.

In addition to answering the research question about the facilitative conversational conditions for creative breakthrough production, this minimal improvisational conversational structure for creative breakthrough emergence also begins to address the broader concern that more needed to be known about how the meaning shifts in creative breakthroughs were made in conversational patterns for wanted pattern replication in collaborative workgroups intent on creative breakthroughs and innovation. A discussion of what these findings might mean to scholarship and practice follows in Chapter 5.

CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

The purpose of this chapter is to summarize the meaning of the findings and to relate that meaning to the literature discussed in Chapters 1 and 2. This chapter is comprised of five sections:

- an overview of the results of this case study in light of the research question and problem;
- the description of a theoretical model for group creative breakthrough emergence that builds on the research findings;
- a discussion of the findings in relation to the key literature reviewed and subsequent related literature that supports or challenges aspects and key dilemmas of the core literature reviewed;
- a reflection on the method, its usefulness, limitations, and significance and other intriguing questions and recommendations for further research; and
- implications for professional practice and final concluding remarks.

Overview of the Results of This Case Study

This research sought to discover conversational conditions that facilitate creative breakthroughs in collaborative workgroups. New meaning generation is integral to the emergence of creative breakthroughs, so the research problem concerned how conversational practices make new meaning happen. Because the research design was an in situ study, and as creative breakthroughs cannot be predicted, only fostered, I was not assured of having any when I began this study, even with a likely collaboration of design students and professional designers.

The research achieved its objective of addressing four gaps identified in the literature. These gaps are listed below with a brief summary of the pertinent methodological and theoretical contributions of this study for each.

a) **Research that focuses on specific conversational practices and process of creative groups with the emergence of new meaning:** This research placed communicative action and meaning-making at the center of group creative endeavor, making the process more accessible for inquiry and replication, therefore dispelling some of the black-box-mystery of group creativity process. There were two methodological contributions associated with focusing on communicative action and meaning making. The first was the application of in vivo research of creative breakthrough emergence with invested groups over time and the resulting conversational practices that evolved new and useful meaning as creative breakthroughs. The second was the use of CMM to analyze design situations and creative collaborations within this case; this was useful in noting pattern interplay amongst contextual or interpretative utilization with language action and the emergence of creative breakthroughs. The pattern repetition of implicative logical force shifts, contextual shifts, and changes in textual action as seen with a bifurcation point contiguity with creative breakthrough emergence further suggests that constructivist communication theory can account for the practical multi-dimensionality of creative occurrence.

b) **Research that identifies conversational practices that might lead to creative breakthrough generation in collaborative workgroups:** I found six conversational conditions that could account for some of the meaning-making and action coordination patterns that facilitated the process of creative endeavor and emergent creative

breakthroughs. These six specific conversational patterns integrated social-affective and cognitive occurrence in a polysemic model of human interaction:

1) the interruption of familiar perspectives with challenge and critique were necessary for the generation of new and useful ideas;

2) expressions of relationship and connection between participants were necessary for the letting go of what one “should” do, and invited participants into a relationship of what they could do;

3) participants taking responsibility for how their choices affected others facilitated the creative breakthrough experience;

4) the groups’ co-evolution of the design story ultimately resulted in a product design concept and creative breakthroughs emerged in that co-evolution;

5) group idea modification, recombination, and ideation with C4 facilitated creative breakthroughs, but with the whole group, ideation occurred only after the group saw the presenter incorporate C4 critique; and

6) the students incorporated and reframed critiques and then authored and named their creative breakthroughs.

Surprisingly, it was not group ideation or modification of ideas that fueled the development of creative breakthroughs as some brainstorming literature might suggest, but rather the combination of interruptive critique and challenge with socioemotive outreach.

The theoretical contribution of this study has several dimensions, both to group creativity literature and to research concerning the formulation of creative breakthroughs with groups.

This study supports Stokes’ affirmation that constraints can contribute to novelty creation (Stokes, 2009). Contrary to a lot of group creativity literature, creativity and creative

breakthroughs can be fostered in an evaluative environment, and brainstorming is not the only major pathway to innovative design concepts. Constraints were present in the general conversational conditions, and interruptive critique and challenge had significant value for the emergence of creative breakthroughs. Creative breakthroughs emerged concurrently with a shifting of contexts-in-use, where multidimensional resources were drawn upon, namely meaning shifts from new interpretations given to contextual resources, logical forces, and bifurcation points (Pearce, 2007). Context-shifting idea generation was instigated by interruptive critique, which questioned the assumptions of optimum conditions for creative generativity (Osborn, 1963); the findings of this research suggest that idea generation can happen in quite constrictive conditions, not face-to-face, with evaluation, not necessarily with a plethora of ideas, and in the midst of the creative process rather than just the front-end. Participants of this study did not necessarily find all of those general conditions satisfying, but creative breakthrough generation happened in them nevertheless.

Creative breakthrough emergence was particularly stimulated by the socially-affective moves of coparticipants, namely the relational, responsibility, and ownership moves described, thus partially affirming that breakthroughs are more social than cognitive (Singh & Fleming, 2010). The shifting and enlarging relational spheres were more important to the letting go and co-evolution of new meaning generation than the individual contributions that the brainstorming literature emphasizes. In part, this was due to the skilled facilitators of design narrative (C4), who could heavily rely on tacit knowledge; this validates the unique role of skilled designers evident in the scholarship of Sutton and Hargadon (1996), Hargadon (1998, 2003), Hargadon & Bechky (2006), and Verganti (2003).

This study also demonstrated that creative endeavor is performed in the narrative mode of language (Bruner, 1986, 1990, 1991), and that creative breakthroughs were caused in narrative, emergent contiguously with the evolvment of a design story. The use of figurative language, namely metaphor and analogy with generous¹³⁷ listening, was most facilitative of creative breakthrough emergence because it allowed for social, affective, and cognitive associations and bridging to occur simultaneously. Although the conversational conditions were improvisational in nature, the range of improvisational verb usage suggested by Weick's theorizing was not notable for novel idea production across the three vignettes of this study (Weick, 1998b). Although the occasional shift verb forms and embellished verb forms were used, patterns were not discernible other than the helpful nature of figurative language already noted.

c) Research that uses a robust constructionist communication theory to assess the creative collaborative moves in new and useful creation: The conversational practices and meaning changes of this study were explained with a robust social constructionist communication theory, which tracked the shifts and changes in meaning as a textual-contextual, reflexive "dance." This adds further understanding to how innovation is made, perpetuated, and resourced in communication (Branham & Pearce, 1985; Giddens, 1984). The discerned, facilitative conversational conditions were shown to be resilient across several different situations and contexts. Therefore, they may be exploited or replicated to enable creative collaboration and creative breakthroughs in other collaborative workgroups.

d) Models for creative breakthrough emergence: In the further explanation and discussion of what these findings mean below, I offer the six specific conversational

¹³⁷ Briefly described, generous listening means listening for the best contributions of the other and in a way to make the other brilliant. This term will be more described further in the Chapter, on pp. 243-244.

conditions in a theoretical, improvisational, group interaction model. The model is also constructionist, since there has been a lack of collaborative models generally and a lack of research in collective creativity that have taken a constructionist communication theory approach to how creative breakthrough meaning is constructed.

This research provides a preliminary model for group creative breakthrough emergence that can be further tested, refuted, and improved upon. The model accounts for both social-affective and cognitive coherence in the process of creative construction as it is based on sub-tending repetitive patterns discernible from a rigorous, constructionist communication theory, CMM. To further deepen the understanding of how creative breakthrough meaning develops cognitively, socially, and affectively, I illustrate the model with another visual of how conversational patterns and the interpersonal creative process happened in a reflexive dynamic. In the following discussion, I describe this model as a theoretical proposition and reflect back on the literature that informed this study.

Theoretical Proposition: The Creative Collaborative Conversational Model and the Literature Discussion

It has been said that in the normal course of daily events, we make sense of our experience by narrative and in so doing, construct a reality and a future all the time (Forlizzi & Ford, 2000; W. B. Pearce, 2007; Weick, 1995). In the course of generating and creating, professional designers¹³⁸ use future-based narrative and stories to imbue new meaning into the construction of new and useful products, services, and possibilities. Meaning is not static, however, as customers and organizations continually negotiate and further develop the

¹³⁸ I build on Linda Blong's (2008) conception of a designer here as one who designs forums for conversations that make a difference in the broadest sense, as well as in the more particular sense of those professionals with the design practice field (Blong, 2008). I offer the understanding that designers are those who construct frameworks of conversation for others to conceive of, and realize possibilities with and by the conversations they co-evolve.

narrative with regards to the relevancy and potential of the products in use. This happened after the introduction of some technological advancements such as the typewriter or iPad as they became cultural products (Luomanen & Peteri, 2013). Some would say that negotiation is also between the organization and their imagined potential customers. Therefore, stories are a way of constructing product meaning and practice, both in the design process and between the client organizations and the greater population of consumers.

I propose the creative collaborative conversational model (Figure 9) as a preliminary improvisational language structure for a creative breakthrough conversation. A precondition of this model is the presence of persons in already formed groups that have embraced the challenge of creating something new, valuable, distinct, and a potential breakthrough for the particular client, event, venue or opportunity. This model grew from the findings and the data of this study.

It is also worth noting that this pattern of facilitative conversational conditions was produced in less than optimum general conversational conditions, so the model may have some flexibility built into it, although that was not tested in this study (see Summary of General Contextual Conditions in the Findings Chapter, pp. 168-169).

Although linearly presented in language and numbered to make the conversational practices distinct, the conditions of the model are recursive and overlapping. Due to the multiplicity of stories present in each utterance and person interaction, and the polysemic nature of each moment, “this” moment and its reality is unlike the “next,” although we relate to moments with shared similarity to make sense and meaning of our experience. Therefore, in other situations, the order of the conditions could overlap, or loop back, or reconfigure haphazardly. I depict them here as they occurred in this study. Yet, taken abstractly, these

conversations could occur in any order that makes sense to the group, and some steps may be more emphasized than others, or occur in pairs. Relational and responsibility moves often occurred in tandem and made a difference for the letting go of prior conceptualizations. Also, I do not suggest that all of the creative conversations of a collaborative workgroup need to occur within the workgroup, or with only these conversational conditions.

As the unit of analysis for this study was the group, the emergent conversational patterns were taken from both the particular design presenter while speaking and the group while listening to the presentation. The practice of this model does not guarantee creative breakthroughs, although the presence of these conversational conditions may facilitate the emergence of creative breakthroughs, based on the patterns observed in this case study. In the presentation of the model, I generalize and abstract the term “designer” to anyone faced with a situation from which to create something new and useful, and outline what conversational practice is important based on the findings from this study. After the presentation of each condition and how it functioned within this study, I discuss how each condition would function to facilitate creative breakthroughs in a collaborative workgroup.

The most important precondition for creative breakthrough from this study was a shared commitment amongst the designer participants to generate and implement something novel and valuable for the respective design situation and future it engenders. It could happen that the design problem of any given design situation has not been formulated, or is vague, ill-defined, or full of contradictions, or, as Cross (2001) would say, a wicked problem (Cross, 2001a). Another aspect to the preconditions is the importance for the designers to gain a sense of the field, scope, and unique character of the design situation or dilemma; said another way, it is the context in which the particular design problem is situated. From this,

designers generate and create the design problem's purpose and propose a design problem worth solving. A design problem worth solving is one that has the potential to meet some felt need within the scope of the design dilemma for the client's potential customer with beneficial future implications. In this study, without a design problem that had tentacles to a greater purpose, the designers and their proposals seemed unanchored to the difference the designer could make.



Figure 9. Creative collaborative conversational model.

Condition 1: Challenge, interrupt, and critique. Critique is essential to creative breakthroughs. Critique challenges and interrupts limiting perceptions, interpretations, narratives, and conceptualizations of a design idea. Without challenge and critique, designers

cannot step beyond what is known, familiar, assumed, perceived, and accepted to try other possibilities and let go of prior conceptualizations. Social and creative challenges and critiques begin to address unknown constraints, simply by questioning. Deliberate interruption by critique functions to push ideas further and could be experienced as uncomfortable or playful. Interruption by critiques and challenges made playfully facilitate more surprising associations and help ease the discomfort.

Condition 2: Relate, connect and let go. Although challenge and critique open the affective, social, and cognitive space for re-combinations and new cognitive associations, social and emotional connection with persons important to the design's emergence advance their development. Relational moves for another's benefit facilitate the letting go of prior concepts and patterns. Relationship and connection have both social and creative connotations, and this orientation is vital to the generation of further builds of the design story or design. Some aspect of recognition, regard, appreciation, or acknowledgment of the design story, the design, or the designer's thinking is needed to hold and widen the opening for the further generation of the emergent design story and newer iteration of the design. Sharing of personal stories, analogies, experiences, and metaphors greatly aid and multiply possible associations and connections.

Condition 3: Choose and take responsibility for social impacts. As the design story and design concept are in a codesign and narrative process with others, it is important for the presenting designer to take responsibility for how her descriptions and explanations of the design concept or the design story are understood and addressed. The locus of responsibility is not upon the listeners to the design explanation to understand, but rather on the speaker to make herself and the implications of her proposal matter. This reinforces the

importance of social, affective, and creative connection, because often the affective-social cues of how the design story is being interpreted and heard are reflected in the body and on the face before anything is directly verbalized. At the base of this practice is the acknowledgment that without another's engagement in the design and its implications, the design cannot be or become valuable. This conversational practice of choosing and taking responsibility for the impacts made while presenting an idea or design proposal center around generous listening and making adjustments moment by moment so that connection coevolves.

Condition 4: Co-evolve the story and the ultimate product. A successful design must appeal to the client and the client's customer in present tense, but also for the future in ways that perhaps have not all been worked out. The development of the design story and what matters about it to the client's customer is the heart of the design, and often the most difficult aspect to achieve. To fully develop the design story and the design, the designer has to be of two minds: engaged in the possible scenarios of the user while holding an aspiring version of the possible story and design solution as a candidate for action. This ability requires contextual dexterity and great empathy, sensitivity, and attunement for the user's future voice as well as the current voice.

Condition 5: Participate in group ideation and modifications. Engaging with different perspectives and asking for group participation in the formulation of the design story and the design is crucial as part of the overall design conversation process. The dialogue raises disjunctures, juxtapositions, and associations about the design story that allows the designer to hone the idea and increase the value and novelty of the design further. Creative breakthroughs emerge when whole new directions emerge from the idea

modification and ideation discourse with others who are willing to be intrusive and challenge the original story by critiquing it, while improvements and refinements are produced from group modification or ideation discourse.

Condition 6: Author, and name the future for the design. As the conversation proceeds, it is important for the designer to incorporate, articulate, and name whatever new creative breakthrough expressions she sees about the design. Although others may have good ideas or suggestions, an authentic ownership of the newer design and its future implications is important for implementation. Successful implementation not only involves both a social and emotional engagement and commitment to the design and its potential by others but also a material commitment. Similarly to the literature reviewed on what sparks the emergence of creativity, the findings from this study had social, affective, and cognitive features. I discuss these further below.

The Cognitive-Social-Affective Dynamic of the Model

Breakthrough meaning is made in language, especially when language is considered to be more than words, but also includes anything else that is used, including a sign, gestures, tonalities, pictures, facial movements, and body movements to name a few (Dewey, 2012). Language is both central to thinking and cognition as well as to communication. Signs and communication are made in social, affective, and cognitive ways—not just sequentially or logically, but also in various combinations and loops in accordance with the context-specific exigencies to make appropriate meaning, such as to make things distinct, to preserve a meaning, to transfer it, or to stimulate it.

The entire context that Joe Smith and Professor Robinson had set up at the outset in the design brief for the Distinctive Greetings Project was a narrative construction: design

communicative products that would help mend or bridge relationship fissures. To be successful with that charge, each designer would have to generate a particular design problem, be able to tell a story that could solve that problem, and produce a design concept so compelling that the client's consumer would be likely to purchase it.

The construction of narrative realities can have a reverberating effect, or afterlife (Carpenter, 2006). C4 and the student designers constructed their reality and the potential reality of their projects for the purpose of producing a product innovation that would hopefully alter the reality and future of Distinctive Greetings. These constructions were with the narrative form of language (Bruner, 1991), rather than a paradigmatic use of language.¹³⁹ Narrative modes of language rely more on the imaginative and believable accounts of experience and deal with particularity, context, intention, action, and consequences.

The design stories and concepts had to convince Distinctive Greetings and potential customers of their likeliness, but first the students had to persuade C4 of their believability and sense to evolve a design concept worth presenting to Distinctive Greetings at the end of the semester. Bruner says the narrative form is conventional, shared culturally, and limited by an individual's mastery of it and her social network. Unlike the paradigmatic form, which might show empirical verification and logics, "narrative constructions can only achieve 'verisimilitude'... governed by convention and 'narrative necessity'." (Bruner, 1991, p. 4).

¹³⁹ Bruner (1986) argued that the narrative form and the paradigmatic form of language, or modes of thought are irreducible to one another as they have different operating principles and features and separate criteria for well-formedness and verification. Paradigmatic language relies on well-formed argument, while narrative turns on good story construction. Paradigmatic modes, also labeled as the logico-scientific mode, are organized around formal, mathematical systems of description and explanation, categorization of operations to form a system. It works for general causes and counts on verification by empirical truth. Paradigmatic language is guided by consistency and non-contradiction, and the domain is bounded by observables, logical relationships, and hypotheses (Bruner, 1986).

Therefore, the participants used the culturally absorbed features of narrative convention¹⁴⁰ and their sense-making abilities to constitute the realities around each design concept offered.

Pearce's CMM theory is a practical approach to the social, affective, and cognitive aspects of polysemic human interaction. Creative breakthrough conversational patterns and the interpersonal human creative process shown in Figure 10 combines the model of conversational conditions above with a Venn illustration of the cognitive, social, and affective resource dynamic to provide another visual of the polysemic interrelationships between context and language action. This depiction shows that the order of the steps could overlap, or loop back, or reconfigure haphazardly. The reflexive arrows on the figure attempt to show the overlapping nature of dynamism. The boundary definitions of the resource domains are drawn to show permeability, with the quality of permeability indicated by the quality of the line. The affective resource domain is represented by a fine dotted line to show how easily distributed affective resources occurred, whereas the more staggered line of the social resource domain represents a more formed and distinct interactive boundary. The cognitive boundary line is represented by a dash---dot stagger pattern, to show both the awareness intake and formulation of thoughts and cognitions as well as the more unformed or unconscious conceptualizations.

The distribution of the conversational conditions¹⁴¹ amongst the cognitive, social, and affective resources is not tidy. Each of the findings has dimensions of all three resources. For instance, Condition 2 expresses what seems to be a very social resource domain, but with a modicum of reflection, the notion of letting go of familiar ideas could also be thought of as a

¹⁴⁰ Bruner(1991) lists 10 conventional features of narrative: (a) narrative diachronicity, (b) particularity, (c) intentional state entailment, (d) hermeneutic composability, (e) canonicity and the breach, (e) referentiality,(f) genericness, (g)normativeness, (h) context sensitivity and negotiability, and (i) narrative accrual.

¹⁴¹ The conversational conditions I shall interchangeably call "findings," conversational patterns, or conversations to more responsibly indicate nuance.

cognitive shift; and the release of “shoulds” an affective one. Additionally, each resource may be drawn upon in the service of some aspect of the other, or used in combination with other aspects.

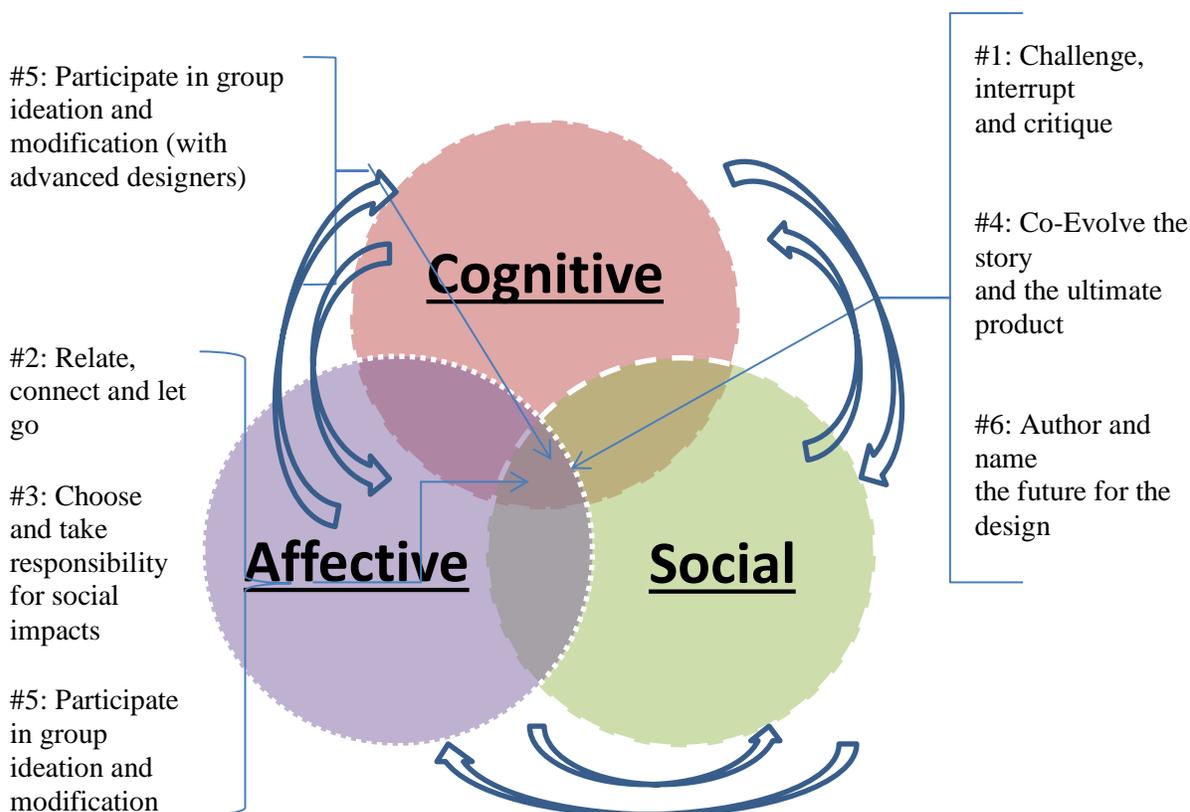


Figure 10. Creative breakthrough conversational patterns and the interpersonal human creative process.

The interpretation of the polysemic quality of action and meaning-making is both ascertained in sequences (subepisodes within the whole session episode) or within specific turns. For a more detailed analysis of the cognitive, affective, and social intersections of the findings in narrative construction, see Appendix CAS, Dynamic Discussion. The

development of a preliminary, improvisational model of conversational action for creative breakthrough emergence in collaborative situations helps to address one of the gaps in the literature. In the next section, I more fully address the first three gaps and discuss how the findings of this study further build on previous scholarship or challenge aspects of previous research on improvisation and brainstorming.

Reflection Back to the Core Scholarly Conversation

This dissertation began by framing out idea generation approaches for creative breakthrough emergence in collaborative workgroups. The core conversation was situated at the intersection of the literature on design practice and some of the socioculturalist literatures. The seven key studies¹⁴² that made up the core conversation were organized around research that focused on how communication is used to support the creativity of workgroups engaged in design, improvisation, and other workgroups where idea generation is critical. Idea generation approaches such as design, brainstorming, figurative language use, creative collaboration, and improvisation were reviewed in several literatures: product design; socio-cognitivist; socioculturalist (e.g., creative collaboration, figurative language, and improvisational literature); and the brainstorming literature, which cuts across creative collectivity, design, and socioculturalist traditions. CMM, the social constructionist communication theory, and the polysemic nature of communication was also accounted for in the literature review, and I suggest that it too could be considered as an approach for enriching idea generation below.

¹⁴² The seven key studies organized by topic area: *Product design collaboration*: Hargadon and Bechky (2006), the scholarship of Andy Dong, specifically Dong (2007), the scholarship of Roberto Verganti, specifically Verganti (2003), and Norman and Verganti (2012) the scholarship of Nigel Cross, specifically Cross (1997, 2001a, 2001b); *Creative collaboration and improvisation*: the scholarship of Kevin Dunbar, specifically Dunbar (1997, 2001), the scholarship of R. Kevin Sawyer, specifically Sawyer and DeZutter (2009), Sawyer (2006, 2007), the scholarship of Frank J. Barrett, specifically Barrett (1998) and Barrett and Cooperrider (1990). The whole topic of brainstorming crosses all of this literature.

This section is organized by idea generation approaches of groups in communication; making wanted repetitive patterns from a social constructionist viewpoint, design, brainstorming and critique, creative collaboration, speculative talk (listening and figurative language use), and improvisation. Within each subsection, I discuss the most important contributions my research has made in terms of the core scholarly conversation that I have joined. In minimum instances, I introduce some new literature from the socio-cultural or design literatures that related to the emergence of creative breakthroughs as they occurred in this study that I did not anticipate at the outset. I do this to provide the reader with a more grounded view of what these findings mean in the current literatures. The various scholars that I reviewed in Chapter 2 discussed the cognitive, social, and affective dynamics of creative collaboration in their research, and this will also be a part of the following discussion.¹⁴³

As anticipated, examining in situ design group interaction with the rigorous social communication theory of CMM yielded the most important contribution of this study: the discernment of a pattern of six specific conversational conditions that helped evolve creative breakthroughs. This contribution to the literature highlighted the reverberating importance of shifting patterns of deontic logics, contextual hierarchies, and bifurcation points with coordinating language action for the emergence of moments that yield new meaning and usefulness. This contribution has been discussed in the Findings Chapter and above with the presentation of the creative breakthrough conversational model. How this research contributed to the various literatures reviewed will be discussed below before I close the section with a summary.

¹⁴³ The scholarship of John-Steiner, Miel, Seddon, Littleton, Cross, Dunbar, Dong, Sawyer, and Barrett most particularly discussed their research with cognitive, social, and affective dimensionality, and emphasized different combinations of those interstices.

Findings and CMM to discern patterns of new meaning. The foundation of this study was built upon some basic knowledge of the creative process in design practice, creative collaboration of groups, and certain concepts and heuristics from CMM. As expected, this study's conceptual framework and research methodology (CMM) contributed to a more nuanced understanding of how new and useful meaning evolved in a collaborative workgroup by revealing the patterns of shifting meaning with specific, coordinated language action. In addition, the findings also contribute to the ever-evolving CMM literature.

In the context of social constructionism, a communication theory such as CMM is considered to be creative because its essential claim is that reality is mutually constructed in communication, and its practical use has shown to produce better social worlds between interactants. Pearce (2007) and others have based their claim that CMM is a creative theory on the reflexive and coordinated relationships between contextual resources and what is said and done during interaction (see Figure 5 in Chapter 3 for the full effect of that reflexivity). The CMM communication perspective has been used creatively in many different fields and endeavors, individually and with groups, to much transformative effect (Goldsmith, Hebabi, & Nishii, 2010; W. B. Pearce, 2012). Various CMM heuristics have enabled researchers to identify meaning shifts being made in the course of an interaction (Marrs, 2007; Wasserman, 2004).

The dynamic of creative breakthrough conversational conditions found in this study were indicative of meaning shifts the participants made that evolved the creative breakthroughs. The confirmation of creative breakthrough emergence was made evident from coordinated logical force pattern shifts, as determined from both video-conference texts and interviews specifically focused on subepisodes of interaction within those texts; namely,

these were shifts from prefigurative/contextual force to implicative/practical force in each of the vignettes. These shifts were also accompanied by bifurcation points and contextual shifts made by the participants as well (see Appendices M2a-c).

Cronen, Pearce, and Snavelly (1979) examined repetitive, enmeshed episodes of interaction and found that context shapes communication, and that a pattern is repetitive if the sequence of the pattern is extended over time (V. E. Cronen et al., 1979). A pattern must show (a) recurrence, (b) stability of the pattern across topics, (c) a wanted or unwanted occurrence, and (d) the communicators' awareness of recurrent engagement. To this last aspect of a pattern the authors added "but could not have avoided," thus emphasizing the unwanted nature of the patterns observed. Cronen, Pearce, and Snavelly (1979) did not go on to identify exactly what would constitute a wanted pattern. Logical force, specifically prefigurative and contextual force, figured prominently in an unwanted sequence, as both the Cronen, Pearce, and Snavelly (1979) study and this study showed.

This study contributes to CMM scholarship in that creativity emergence could be said to be evident whenever a pattern of implicative/practical force is sustained over several episodes, especially in contrast to a prefigurative/contextual force pattern. The presence of a prefigurative/contextual force pattern was associated with struggle, tensions, and frustrations in this study. A defining factor of implicative social force is that it changes the context for future action and interpretation. In this study, the presence of implicative force indicated a shifting from unwanted to wanted patterns of interaction and is thus associated with a positive pattern, but that is not necessarily always the case. Creativity emergence can also be perceived as negative by all parties participating in an interaction if what is being created is an unwanted pattern. In either case, whether the presence of implicative force has a positive

or negative connotation, the presence of implicative force has changed the future meaning and direction of action for the participants involved. In this way, implicative force could be renamed to “creative force,” for it changes the contextual resources drawn upon for action. This pattern of implicative or creative force/practical force also then more firmly establishes wanted repetitive patterns, in addition to the other aspects that Cronen, Pearce, and Snively (1979) laid out.

Design. Patterns of communication that enact design and the role of designers as protean knowledge brokers and facilitators of change represent core themes from the design literature. Though deal with the ways in which new meaning emerges in collaborative workgroups, and also present limitations and opportunities for new directions of research.

Communication patterns and emergence of creativity. The six conversational conditions found in this study were congruent with and extend the communication pattern findings of two studies of designers and design conversation (Hargadon & Bechky 2006) (Dong, 2005).

Help seeking and help giving. Like Hargadon and Bechky (2006), I found a behavioral pattern of help seeking, help giving, reflective reframing, and reinforcing behaviors to be present and contributory between C4 and the Levenson design students. Help giving and help seeking were evident in the specific conversational conditions of challenging and interruptive critique (Finding 1), relate, connect, and let go (Finding 2), and in the making of relationally responsible moves and choosing (Finding 3). Hargadon and Bechky (2006) further contributed that appreciation expressed for the resolution to tough problems aided help giving and help seeking, but they did not make evident how that happened or in what kind of manner. Findings 2 and 3 from this study more specifically extend how

appreciative ways are shown between design team participants as Hargadon and Bechky (2006) asserted. Help giving and help seeking behaviors could also be thought of as negotiation and adjustment moves, and these were made by the C4 design professionals as well as the design students as exemplified in Findings 2 and 3. Expressions of appreciation were made after the initial critiques were given as a way to further open the shared understanding of the offered design solution,¹⁴⁴ as seen in Finding 2, as well as showing concern and taking responsibility for the effect of how one tells the story and how that story landed on their collaborators.

Reflective reframing. The findings of my study added a further granular understanding of how the reflective reframing in a collaborative group design process, which Hargadon and Bechky (2006) first identified, might happen. Reflective reframing could be called the nexus of recombination and creative insight as it shows that the added ideas, comments, and suggestions made with an intention to build upon another's creative proposal have been incorporated. Reflective reframing can be discerned in the reframing and naming of the incorporated critique (Finding 6), and reinforcing behavior in the additive group ideation aspect of group ideation (Finding 5). The specific aspects of reflective reframing, namely the gradual incorporation process of critique consideration (as seen in the Bailey and Samantha vignettes), and then the re-naming of their projects more thoroughly documented how people actually deal with critique and then transform it with their own authorship. In short, this study makes the patterns of interaction Hargadon and Bechky (2006) outlined

¹⁴⁴ Some specific examples of the conversational practice of using appreciation were in the Dora, Samantha, and Bailey vignettes: Dora: "Your drawings are nice" says Tulip after delivering a criticism and watching how Dora dealt with it as well as Violet's metaphorical story to Dora about the weather and validating her sense of how much conversation about place is an important relational bridge for people who have infrequent face to face interaction; Samantha: Wendy says to Samantha, "I like how you are telling this story" after Samantha is critiqued by Violet; Bailey: Tulip's reminder to Bailey about her earlier experiment in Turn 14.

more practically accessible for those interested in producing reliable innovation because it identified both the kinds of specific language practices used and how they reflexively coordinated with the meaning-making dimensions that shifted contexts.

Reflexivity and historicity of norms and contexts. Andy Dong examined the construction of how language enacted design by the pattern of three main functions: (a) the aggregation or blending of ideas and concepts; (b) the accumulation or scaffolding of ideas and concepts; and (3c) the appraisal or evaluation of ideas and concepts (Dong, 2004a, 2005, 2006, 2007; Dong et al., 2005; Kleinsmann & Dong, 2007; Wang & Dong, 2006). Dong (2007) said that the interstices of language action coordinated with the reflexivity and historicity of norms and contexts to produce design concepts, but he did not show how the group members specifically did that to make new meaning. The six conversational conditions that facilitate creative breakthroughs of this study added more insight into how designers utilized contextual frames for the emergence of the new and useful. The theoretical and methodological framework of the CMM communication perspective provided a construction of seeing how participants in interaction reflexively coordinated their action with the historicity of norms and contexts in the emergence of new meaning (see the conversational maps in Appendices M1a-c and M2a-c).

My findings showed the specific kinds of conversations and the ways students borrowed and utilized the aggregated professional knowledge and insight of C4 to successively create a design concept, but had to find a way to make their incorporation of the interruptive critique (Finding 1), through the coevolution of the design story (Finding 4) and group ideation (Finding 5), in an authentic reframe that they named and authored (Finding 6). The pattern of accumulation is the building up of knowledge structures, whether

from personal, informational, or professional knowledge bases, that construct a design concept into a new representation. So it could be said that Findings 4, 5, and 6 also show the accumulation function, and that the accumulation function is recursive, at different levels and stages of design discourse over time. My study offers researchers such as Dong and Hargadon the ability to also track the kind of new thought and meaning emergence from the shifting of contexts. In addition, it supports the assertions from both scholars that new meaning emerges from the lexicalized concepts over time and has the potential to reframe what had occurred in the past.

Designers as facilitators and knowledge brokers. The literature that showed designers as protean knowledge brokers and facilitators of change¹⁴⁵ in the more macro sociocultural view was validated by the more micro-interactive view of this study. I found that skilled facilitators of design narrative were needed for creative breakthrough emergence as they could heavily rely on tacit knowledge in the facilitation and participation during group ideation (part of Finding Five). This validated the unique role of skilled designers evident in the scholarship of Sutton and Hargadon (Sutton & Hargadon, 1996; Hargadon, 1998, 2003; Hargadon & Bechky, 2006).

Transferability. In part, transferability can happen because of the recurrent pattern of combination, mutation, analogy, and first principles iteration that designers repeatedly use when making sense of a design challenge/situation as Cross (1997) cited to Rosenman and

¹⁴⁵ Sutton and Hargadon (1996) and then Hargadon (1997) discussed how IDEO designers functioned as knowledge brokers since their wide experience with different industries and projects would be useful for seemingly unrelated current projects, and that their ability to offer idea modifications and idea generation increased because of the width and depth of their knowledge. Also this knowledge base enabled them to “broker” new possibilities and alternatives in brainstorming, and that became highly valued in the firm. Therefore, designers sought to further expand their knowledge base, not just through experience with projects, but also in terms of exploring other interesting juxtapositions with additional possible design solutions. The more ‘other alternatives’ the designers could offer in brainstorming, and with clients, the more a designer’s reputation increased.

Gero (1993; Cross, 1997, p. 314). More contemporary scholars (Dong, 2004a; Dong et al., 2004; Norman & Verganti, 2012) credit Schon's (1991) analytics and reflection theory, which addresses the way that designers are in a constant conversation with the contextual situation of the design challenge, showing an engagement of the designer with the language of the situation and the designers' discovery of the implications of each element of the design as well as his own changing stance towards the design (Schon, 1991, p. 95). As knowledge brokers, designers can transfer knowledge and meaning gleaned from one seemingly unrelated domain to another because of the first principles they have learned from their immersion in the process of designing.

Although meaning is often context specific, analogy and first principles transference enabled the C4 professional designers to teach the Levenger participants how to discern and construct new possible futures for Distinctive Greetings by exposing the students to C4s wide-ranging perspectives, sensitivities to the sociocultural contexts of the situations the students proposed, and C4's preference for finding surprising connections as a way of design research. New meaning would emerge from the mutual contextual shifts the students and C4 made about each other as well as the emergent design story and solutions that would be reframed during the process of incorporating the critique (Findings 1, 4, 5, and 6). My study offers a greater ability to track and more deeply understand the socio-cultural contexts that are shaping the design situation so that the more appropriate and innovative analogies and first principles can be constructed and then transferred into a design solution or linked to another design challenge.

Design-driven innovation. Design-driven innovation depends on the capabilities of designers to understand, anticipate, and influence emergent new product meanings (Verganti,

2003). This study extends the dimensions for language innovation through messages. By increasing language innovation through messages, as well as radical technological performance, breakthrough innovation is achieved (Verganti, 2003). The sociocultural signs and symbols inherent in product knowledge that users might access to ascribe new meaning and new attachments to products is more accessible to designers as knowledge brokers, as Verganti (2003, 2009) and Norman and Verganti (2012) asserted.

This study showed how designers could get deeper underneath the socio-cultural signs and symbols of language action to discern various dimensions of contextual influence and other background influencers of meaning-making. Ascriptions of meaning occur in stories, and in the Dora, Bailey, and Samantha vignettes, C4's work with the students evolved new meaning (and possible new futures for Distinctive Greetings). By noting the particular sequential structure of language action, examining videotaped sessions for socioemotional cues, and interviewing the participants later about specific sections of language action and the background meaning-making with CMM heuristics, this study showed that there are more ways to get underneath the explicit language to uncover stories of influence that shaped action and innovative meaning. Design-driven innovation could be enhanced with a more nuanced perceptual foundation for discerning and reading contexts-in-use and logical forces enabled by the findings of this study as well as the theoretical framework of the communication perspective of CMM.

Brainstorming and critique. Brainstorming is almost synonymous with any form of idea-generation and recombination from group interaction. In the literature, brainstorming, dialogic creative collaboration, improvisation, and the use of figurative language are some of the idea generation approaches promoted for the rich associative and divergent thinking that

is believed to be essential to creativity. The findings from this study further contribute to understanding the limits and drawbacks of group creativity as a brainstorming process.

Group creativity processes are both limiting and supportive to emergent creativity in groups. In the socio-cognitivist literature, sociocognitivists have argued that group interaction and brainstorming inhibits creativity. Two criticisms were partially validated by this study. Comments from Samantha and Dora in their final interviews about their lack of verbal participation in the groups' weekly sessions with C4 indicated that aspects of the social process were inhibiting. Both mentioned that waiting their turn to speak and hearing their ideas spoken by others stopped their flow of newer ideas; thus, idea blocking occurred (Diehl & Stroebe, 1987; P. Paulus, 2000; P.B. Paulus & Dzindolet, 1993). Dora mentioned that she would also let the group carry the conversation, indicating that some social loafing happened (Karau & Williams, 1993). Yet the findings from this study are more in alignment with Kohn, Paulus, and Choi (2011), who found that idea combination processes of interacting groups gave more novel and feasible combinations with rare ideas and viewed the social dimension producing positive benefits. The interruptive critique, co-evolution of the design scenarios and design concept, and mutual idea generation between the students and C4 heightened the novelty and potential long-term value of the all the student's ideas to Distinctive Greetings and overrode dissatisfactions with aspects of the social process.

Brainstorming and having a nonjudgmental environment are not the only group interaction processes for creative breakthroughs. In the design and socio-cultural literature, Sutton and Hargadon (1996) argued that the routine uses of brainstorm¹⁴⁶ by a product development firm (IDEO) were effective for the individual participants, the group creativity process of problem assessment, idea generation, and concept refinement. Brainstorming

¹⁴⁶ At IDEO, the brainstorming processes are termed "brainstorms."

might be expected in the idea-generation phase of any group, and in the Distinctive Greetings Project collaborative group especially, since it was a design group with professional designers accomplished in envisioning, similar to IDEO in stature and reputation. But idea-generation and recombination happened more with interruptive critique (Finding 1), the coevolution of the design story (particularly with figurative language and generative metaphor and analogy use) (Finding 4), and then with propellant patterns of idea generation and recombination with C4 and additive patterns of idea recombination by the students (Finding 5). This progression was dependent on the relational moves made that helped letting go of prior conceptualizations (Finding 2) and the sensitivities shown between participants for the effects they had on one another (Finding 3).

Interruptive critique made way for enlarged design problems. Although critique is evaluative and could be interpreted or anticipated as either noncollaborative or as a lid to idea generation, Herring, Jones, and Bailey (2009) found critique to be one of 19 idea generative techniques cited by 10 designers involved in product design process. Herring, et al., defined critique as

receiving input on current design ideas. This could be collaborative, such as receiving a design critique from a colleague or individuals critiquing their own ideas (either systematically or intrinsically). This technique often spurs new thought by finding solutions to design flaws within current concepts (Herring, Jones, & Bailey, 2009, p. 5)

C4's use of critique went beyond finding solutions to design flaws within current concepts. C4 used critique to intentionally interrupt the direction and size of the students' design problems. Violet's weather and place analogy made it possible for Dora to see a larger context for her relational design solution; Tulip built upon the "break the rules" aspect of Bailey's design experiments with her suggestion and permission to "go opposite of

Distinctive Greetings,” and Violet’s critiques helped Samantha reframe her concept from a narrow medical focus to a broader, consumer focus. C4’s critiques seemed to open and enlarge the possibilities of the students’ design problem conceptualizations, which would then co-evolve in dialogue about the design scenarios.

One of the advantages of brainstorming is gaining others’ perspectives and ideas, upon which you can build, refine, and evolve. Perspective taking is described by Boland and Tenkasi (1995) as appreciative and energetic collaborative exchange, evaluation, and integration between diverse individuals of their distinctive knowledge within a community or organization (R.J. Boland Jr & Tenkasi, 1995). In each of the vignettes, perspective-making critique had to first interrupt the students’ design stories already in motion before new thought could be further developed with perspective taking, rather than brainstorming.

Co-evolving the story with new perspectives. As the students presented their design concepts, they did so narratively, with design scenarios constructed to tell the story of solving their design problem. According to Cross (2001), design problems and design solutions co-evolve but do not progress in a linear fashion of design problem first, then design solution. Rather than make a large cognitive investment in constructing a design problem in well-defined ways, designers would rather take a design brief as the context, formulate problems within it, and use solution conjectures or hunches so as to co-evolve the solution and the problem together as a way to focus the solution (Cross, 2001, pp. 4-5). This seemed to be the tack Bailey had taken, but by the time of this episode, the design problem had not evolved with the stories she had been telling, leaving her possible four design solutions rudderless. The story of the design problem worth solving was needed. In order to have new perspectives taken on and design scenarios and concepts to emerge for Bailey (and

the other students), stories had to be interrupted—stories about the situation, the student self, or the design scenarios.

In order to get to the design scenarios, C4's challenging critique had to interrupt the socioemotive characteristics and stories of the situation and student self. Examples of this were the Dora and Bailey vignettes, where the scenarios presented were confusing and limited the design. CMM analysis revealed the contextual resources and perspectives the students were drawing upon that might make the scenarios confusing, such as the context of present-and-perform-for-an-audience in Dora's case, or "professors should help me with the middle part" in Bailey's case. Both of these were socioemotive contexts about the situation that critique had to interrupt, as did the design story and concept, so as to provoke greater perspective taking and making.

The student-self story was also interrupted from the data of this study. From the struggle patterns evident from the combination of language action and interview data, each of the students had elements of dissatisfaction with her progress.¹⁴⁷ The students said they felt more comfortable with progress experience that resulted from the desk critiques Professor Robinson provided when not in session with C4, which aligns with Schrand and Eliason (2012) who found desk critiques to be the most helpful of the five critique methods. The negative emotions that accompany final critiques, however, were perceived by the students in this study to be the most interfering to learning, even though Schrand and Eliason's participants (2012) ranked them as second in helpfulness.

Transformative and additive idea modification. It could be argued that Finding Five is technically the "brainstorming finding." In this study, idea modification had a similar

¹⁴⁷ Dora was unsure of what C4 expected and dissatisfied with the mode of communication in relating to them generally, Bailey knew she was behind, and Samantha said she was unprepared for the session that I analyzed.

transformative effect as it did in Sutton and Hargadon's (1996) study, with the critique of the professional designers, C4, and not with the group generally. When the whole group participated with the offer of their ideas after the presenting student had a chance to incorporate some of the critique, the design concept was improved in an additive fashion, which was supportive to the presenter and the group generally, but the particular professional advantages to the group as a whole were not noteworthy.

The additive pattern of group modification and the positive affective-social influence evident in the Bailey and Samantha vignettes helped the presenters consider and take on the implications of applying the critique that shifted and strengthened the evolving design story in the Samantha vignette. While the students' additive engagement does not directly impact the direction of the presenter's design story, in the Samantha and Bailey vignettes, the students' participation made ignitive and indirect contributions, for C4 would become sparked to offer different choice points to the presenters based on a suggestion or playful engagement from the students.^{148, 149} Samantha's whole design concept changed from this indirect dynamic.

Rick asserted that the additive design-solution ideas came quickly after Bailey and C4 had cocreated a design problem worth addressing. The most combinatory, freer-flowing idea exchange happened in Bailey's vignette after she incorporated the critique and reframed her project and naming it "random acts of truth" in Turn 18.¹⁵⁰ Yet the students' smiling and laughing reaction to "go opposite" of Distinctive Greetings earlier (in Tulip's Turn 14), and Rick and Bailey's playful interchange on "evil Distinctive Greetings," helped Bailey incorporate C4's critique.

¹⁴⁸ See Appendix T2, Turn 18/188-192.

¹⁴⁹ See Appendix T2, Turn 23/229-232.

¹⁵⁰ See Appendix T3, Turn 18/232-233.

In critique delivery and then working with the students to evolve the next iteration of the design story and design concepts, Violet and Tulip were aware and responsive to the emotional and affective undercurrents of the background conversations that poked through in the foregrounded comments (e.g., Bailey: “I don’t know if Distinctive Greetings would like it”) while still propelling the design forward. Their comments for idea generation were not presented in brainstorming mode, but rather as points of reflection, observation, or discussion made usually in analogy or metaphor.

This nuanced approach showed that the relational connections were more important for the letting go of prior conceptualizations, causing creative breakthroughs to emerge through the coevolution of the design story. From the above discussion, taking newer, larger, or different directional perspectives that C4 offered as part of their critique was dependent on the deliberate interruption of the story trajectory in a relational unit, not simply as two individuals contributing or building upon one another as the brainstorming literature emphasizes.

Creative collaboration. In this study, relational connections emerged along with creative breakthroughs. Stories of the self and the others shifted throughout the duration of the project, with notable shifts in energy, contextual references, and meaning. These shifts were related to letting go of prior stories of self and others, which released tensions and increased trust, as much as they were related to the dialogue and sharing of different perspectives. The shifts and perspectives taken to new and larger intelligibility for the client could not have co-evolved without the companion collaborative moves that shifted the relational sphere, where a sense of value is developed (McNamee & Gergen, 1999). All of the findings of this study indicate that the relational sphere was more prominent for the

emergence of creative breakthroughs than a sense of individuals contributing various inputs in a brainstorming session. Relational moves noted in Findings 2 and 3 were most important for a relational re-orientation needed to develop new meaning, but listening, improvisation, and figurative language also rounded out the dimensionality of the relational sphere.

The findings of this study echoed three distinctions of creative collaboration scholarship and group interactive conditions that have socio-affective dimensions. Creative breakthrough emergence in this study reinforced the idea that creating collaboratively is an emotionally charged process as people simultaneously construct meaning and relationships as they generate ideas (Littleton & Miell, 2004). The conversational analysis of the video-conference sessions enabled the emotional aspects of full communication to be seen and accounted for with the design's emergence. The final student concepts represented a blending of skills, temperaments, and sometimes personality highs and lows so that something new and useful could be made (Moran & John-Steiner, 2004). These "blendings" were most obvious in the cocreation of the design stories and solutions (Finding 4) and the propellant and additive patterns inherent in the group ideation (Finding 5). The outcomes could not have been predicted or summed at the outset of this group project, and that interdependence grew over the course of the collaborative relationship (Sawyer, 2003).

Relational moves facilitated letting go (Finding 2). To interactively make new meaning, a new opening has to be created so as to appraise prior conceptualizations and consider other perspectives. Often, emotions are tied to action (Flaherty, 2005), and occur in a reflexive dynamic. Positive affect actions provoke more positive actions and reverberating self-effects in others (Amabile, Barsade, Mueller, & Staw, 2005). This became evident in this study: when C4 shifted gears from delivering critique without appreciation and affirmation to

delivering critique with it, new meaning making became more possible in two ways—one expressed particularly, and the other from a generalized contrast. First, appreciative moves facilitated students to either let go or loosen the grip of previous and familiar conceptualizations or approaches so suggestions from C4 were more fully considered.¹⁵¹ Affirmation of the students' work also invited the participating students (not just the presenters) into a more expansive and deeper world-view of the client dilemma.¹⁵² The second way relational moves helped participants let go of preconceived notions was the contrastive function of acknowledgment and positive affect against a backdrop of generalized, anticipatory angst about design sessions with C4 that the students reported.¹⁵³

Relational responsibility (Finding 3). Relational responsibility was necessary for this collaborative group's generation of creative breakthroughs. They held the interaction dissonance when the interaction had become too monologic, re-centered the conversation back into the dialogic domain, included the other person, showed compassionate responsiveness, and made an effort to see the situation from the other's point of view and imagined world of concerns. This affirms John-Steiner's (2000) research on creative collaborations, specifically the dimensions of integrative collaboration, and the complementarity she noted of artists and women in collaboration. C4 did this most often, but all of the students demonstrated aspects of these moves, as touched upon in Chapter 4. These

¹⁵¹ Evident in the Dora and Bailey interactions, and explained earlier in the Finding Chapter.

¹⁵² Most noticeable in the Samantha and Bailey interactions, see Turns 16, 19, 21, 24, 25, and 29 of the CA transcript of Samantha's vignette, Appendix T2; and Turns 17, 23, and 26 in the Bailey CA transcript, Appendix T3.

¹⁵³ When reviewing the transcript of her session (Appendix T2), Samantha said "I presented well for being so nervous, so that's surprising" (Samantha) and Dora expressed her apprehensiveness about the C4 sessions when she said, "it felt like the focus was on this bridge between us. So from C4, the energy or the expectations was very large to me. Like a lot of pressure from them...I just felt pressure to perform a certain way and would be more comfortable to do so if that bridge between us was clearer."(Dora). Rick said that Bailey "was always [in] this dichotomy with the way that she presented ; outside of class [with C4] she'd worry a lot like oh is this the right thing to do?...but once she presented to the C4 people she always presented it as this was the positive progress like she had it under control and was happy and excited about it, so I think there were two sides of her presentation." (Rick).

relationally responsible moves enabled the accessing of increasingly inclusive contexts for implications of more possibility and gave participants more choices. Choice points, or bifurcation points, were closely associated with the making of larger meaning, which was undergirded by patterns of contextual shifts, deontic logic shifts, and affirmative language.

Speculative talk: Listening and figurative language use. In Chapter 2, I defined speculative talk as the kind of listening and talk that nurture and sustain both collaborativeness and creativity in group dialogic process. Creative collaboration scholars Moran and John-Steiner (2003; 2004) and Seddon (2004, 2005) highlighted the mutual attunement good collaborators develop with one another since creative production can be so emotionally demanding and intense. In order to both advance the creative work and the collaboration, emotional intensity is negotiated continually for the evolvment of shared meaning.

Importance of generous listening to relational moves. Part of the perceptual process in collaborative communication involves a social-affective dynamic, as was noted by some creative collaboration scholars (Sawyer, 1999; Seddon, 2004, 2005) and organization theory scholars (F. J. Barrett, 1998). In part, this is due to how keenly jazz musicians listen. Barrett (1998), Sawyer (1999), and Seddon (2004) discussed how finely attuned jazz musicians were to one another and the way they knew when and how to defer to showcase another's solo during improvisation. Emotional dimensions are often communicated para-linguistically as well as directly in the course of regular social interaction and are an important source of information for all parties in a communicative interchange. Emotions are also such an integral part of social interaction that the understanding of what is effective

communication includes the context appropriate sending, interpretation, and experiencing of social-emotional cues ¹⁵⁴ (Halberstadt et al., 2001).

At the outset of this study, I postulated that creative listening, or the additive nature of listening with a “yes, and...” orientation found in comedic improvisational practice that Sawyer distinguished would be a critical component of creative breakthrough emergence (Sawyer, 2004a; R. K. Sawyer, 2007; Sawyer & DeZutter, 2009).¹⁵⁵ A “yes...and” orientation could be an invitation for an opening that the listener was making, or have elements of the listener’s agenda in it. However, another type of attuned listening was present that helped each student to let go of previous stories and meanings that they had been making. This listening had aspects of the refined attentiveness and coconstructive, mutual potentiality that John-Steiner (2000) described about the Curie partnership; a listening practice that is on the behalf of the other person. The given listening in this study that seemed to be the most helpful to the speaker possessed this generous quality. Letting go began more with generous listening, a form of listening that Barrett (2012) highlighted of jazz improvisers,¹⁵⁶ than creative listening. I offer one example of this generous listening.

¹⁵⁴ Amy Halberstadt, Susanne Denham and Julie Dunsmore’s (2001) excellent theoretical overview of the dynamic processes that underlie social-affective competence. They emphasize that affective-social competence is an integrated dynamic core to interactions, and is comprised of three components; sending, receiving, and experiencing context appropriate messages. Affective-social competence is distinguished from emotional competence because the eight skills of emotional competence that Saarni’s research found (1990, 1997, 1999) more emphasize experiencing, and lean towards an intra-psycho rather than a social experience. Affective-social competence is different from social competence in that social competence emphasizes social skills, peer status, relationship success, and functional goal-outcomes (Rose-Krasnor, 1997), and ignore the relational and intra-psycho dimensions (Halberstadt, Denham, & Dunsmore, 2001, pp. 80-88).

¹⁵⁵ Creative listening is defined as an operational definition of this study in Chapter 1, on p.19, and in Chapter 3, p. 146.

¹⁵⁶ Barrett’s (2012) describes generous listening as “...unselfish openness to what another is offering and a willingness to help others be as brilliant as possible”, with an awareness of where the other is heading. Barrett also cautions that generous listening does not mean uncritical, for if the generous listener is attuned to where the speaker/player is heading, then interruption or redirection from the listener might be the very best example of his generous accompaniment with the speaker (Barrett, 2012, p. 122).

When Tulip acknowledged Bailey and her previous Warehouse experiments in a warm voice with connective moves in Turn 14, perhaps she was attuned to deeper motivations than Bailey could express in that moment, but had before. Tulip's attuned listening of Bailey then retuned Bailey's of herself and what she still could do. This was critical given the impending deadline. Bailey said she could then start to hear what Tulip had been saying to her. This is consistent with Creede's (2008) theory of relationally generative interactions and relational eloquence, where the coparticipants draw on shared resources, specifically in the form of accessing aspiring stories of the other, and open possibilities for all in the interaction (Creede, 2008).¹⁵⁷ The group's appreciation for Tulip's further suggestion that Bailey go opposite from Distinctive Greetings in Turn 14 was marked by a lot of smiling, laughing, joking around, and head-nodding amongst all of the participants, which helped Bailey let go of her confusion. In addition to the other elements, the mood change, the level of listening engagement, and the positive response of the group in Turn 14 helped Bailey let go of her adherence to the four little ideas¹⁵⁸ she had for her presentation at the outset of her interaction and begin to try on the critiques and the suggestion made by Tulip.

Figurative language: Metaphors and analogies facilitated both the relational sphere and generation of new meaning. Metaphors and analogies used in this study confirmed Dunbar's (1997) seminal work on analogy's power with in vivo interactive research (Dunbar, 1997a, 2001a, 2001b; Dunbar & Blanchette, 2001). Metaphor and analogy played a double bridging role; they built emotional and relational connection where tensions or no connection was present and helped to co-evolve the design story and solutions.

¹⁵⁷ Tulip's seemingly deliberate reminder to Bailey of her former creative experiments during the semester is the best example of using relational eloquence, when she elicits and reinforces Bailey at her best, with Bailey and the group in the interaction.

¹⁵⁸ Bailey's words, see Turn 1 /12 in the CA transcript, Appendix T3.

The bridging effects of metaphor and analogy in this study also confirmed some of the organization theory literature on metaphors (F.J. Barrett & Cooperrider, 1990; Sackmann, 1989; Srivastva & Barrett, 1988; Weick, 1998b). As was discussed earlier and shown in the conversational maps (Appendices M1a-c; M2a-c), C4's use of metaphor and analogy in the Dora and Bailey vignettes helped turn tension-filled interactions to situations where both Dora and Bailey could overcome some rigid perceptions, see their former ideas in a new way, and create new scenarios of their design stories, which would in turn cause new actions.

Barrett and Cooperrider (1990) termed this use of metaphor as *generative metaphor*, for it is a way to indirectly intervene with groups or persons who are engaged in a negative mode of interaction to help them cultivate fresh perceptions. This was especially important for the Bailey interaction, as C4 had tried to intervene six times in the Bailey interaction before Bailey could begin to successfully connect with C4.¹⁵⁹ There was little evidence of previous social routines for mutual cooperation, leaving Bailey in the last session perhaps deeply questioning her own ability to pull it off before the final presentation to Distinctive Greetings a week later.¹⁶⁰

Improvisation and conversational structure. The findings of this study also confirmed most of the group creativity aspects that Sawyer (Sawyer, 2001, 2006a; R. K. Sawyer, 2007; Sawyer & DeZutter, 2009) and Seddon (Seddon, 2004, 2005) have investigated and distinguished, both for creative collaboration and the dimensions of empathetic attunement needed for improvisational comedy and jazz. This study strongly

¹⁵⁹See Appendix T3, Turn 2/64-70, Turn 4/84-85, Turn 6/97-102, Turn 9/151, Turn 10/155, Turn 12/172-175.

¹⁶⁰ I have deduced that there was little evidence from the social routines between Bailey and C4 for critique cooperation from analysis and review of three sources of data; the anonymous questionnaire responses from C4, a comparison of the incorporation patterns amongst the three vignettes (see Table 12, Improvisational Conversational Structure for Creative Emergence for an overview of the distinctive patterns of each vignette), and from the C4 interview reports.

echoed the importance of several of Barrett's (1998) findings from the jazz improvisation analogy for organizational leadership and innovation practice. Creative breakthroughs in this study would not have occurred were it not for provocative competence by C4 in the provision of interruptive critique. The ability of the students to support as well as feature and further each other's projects with additive idea generation (Finding 5) highlighted Barrett's noting of how jazz musicians support and solo in a coordinated fashion with minimal structures. The incorporation of critique through the co-creation of the design story and solutions (Findings 4 and 6) also build on Barrett's foundational observation that the embracing of errors as sources of learning enabled truly creative emergence amongst musicians. Despite linkages between these findings and the improvisational literature, the only significant contribution back to that body of literature is related to the work of Sawyer and DeZutter (2009).

Sawyer and DeZutter (2009) stated that creative collaborative emergence is unlikely in routine or ritualized situations such as business meetings, since the group process pathway is set, predetermined outcomes are stated, and control is in the hands of a single or few persons. While the findings from this study were not derived from improvisational performances, the nature of the weekly conferences were improvisational in that the dialogues were highly contingent on context and language action, the outcomes were bounded within a structure but not predetermined, and collaboration was expected. The findings of this study both deepen and extend Sawyer and DeZutter's (2009) findings and assumptions, as well as challenge their claim about the likelihood of settings for the production of creative collaborative emergence.

Considering Sawyer and DeZutter's (2009) assertion, the preference given to C4's opinions, the difficulty in spontaneously sharing, and the unequal contributions between the

two groups, we could have predicted that creative breakthroughs would not have occurred in this study. Yet creative breakthroughs did emerge. Sawyer and DeZutter (2009) claimed that for improvisational, surprising, and creative outcomes, a group interactively aligns itself with four emergence characteristics: (a) the production of an unpredictable outcome that is not known at the outset; (b) the way of arriving at the outcome is in a moment-to-moment contingency as any one action is dependent on the one before it and the next moment is also unknown; (c) any one action can be changed by the subsequent actions of others in the group; and (d) the process is collaborative and participants can contribute co-equally (Sawyer & DeZutter, 2009).

Creative breakthroughs could emerge in this study, even in a constricted environment, because the groups, in the main, did align themselves with the four emergence characteristics that Sawyer and DeZutter (2009) specified, and my study validates this part of the literature. In part, this may be due to the historicity of design practice and assumptions, particularly from a cocreative orientation, for they did not explicitly take the four characteristics and pledge their alignment. C4 and Levens' alignment with these characteristics was reflected in their conversational practice, in the dynamic of the six specific conversational conditions that facilitate creative breakthroughs. Two aspects of the dynamic—namely, the relational moves and letting go of previous conceptualizations (Finding 2) and taking responsibility for the impact one has on others (Finding 3) more specifically articulate the kind of collaborative engagement that could make creative breakthroughs happen in such a constricted environment. These two specific conversational conditions were the ones necessary for an increase in mutual participation and made the dialogue more contingent and constructive in the design process, allowing for something new to emerge in the encounter itself. These

aspects also enabled the groups to transcend the constricting performance/critic context they felt when presentations were made and eased the coevolution of the designs with richer idea-generation and modification and reframing (Findings 4 through 6).

The findings of this study deepen and extend what Sawyer and DeZutter (2009) may have meant when they spoke of contingent dialogue. My study provided a dynamic model and specifically showed how two of the specific conversational conditions advance the collectively social and creative phenomenon of group interaction for creative breakthroughs as well as challenge the embedded assumption that creative breakthroughs are not available in improvisational dialogue in routine settings.

Summary of the Core Literature Discussion

The findings from this study built upon the foundations about creative collaborative emergence from much of the design research on conversational patterns in design practice, creative collaboration, improvisation, analogy and metaphor literature, and some of the socio-cognitivist literature. The veracity of brainstorming as a pathway for creative breakthrough production was challenged by this study's findings. Creative breakthroughs can be generated in constricted environments, and not face to face. Finally, this study would contribute to design-driven innovation research in the design field and to CMM scholarship and practice.

Reflections on the Method, Its Use, and Qualifications on the Conclusions of the Study

Reflections on Methods and Usefulness

This section reflects on the methods used in this research. The usefulness of the methods used, the limitations of the research, and calls for future research are also addressed briefly.

The research question was an interrogative fit for the purpose of the study and the paradigm. As a scholar-practitioner, I had hoped that this case study would provoke theory building about collaborative workgroup creativity as well as useable theory in practice. The question, “What conversational conditions facilitate creative breakthroughs in collaborative workgroups?” focused on the in-process construction of creative breakthroughs and which kinds of specific conversations produced it. The question was a practical question, placing the communicative making and doing at the center of concern that some say is the center of philosophy and theory, not knowledge (V. Chen & Pearce, 1995; Dewey, 2012).

The research question was an interrogative fit for the purpose of the study and social constructionist paradigm in which the study design and instruments were made and conducted, and the data analyzed. Social constructionism is an alternative to the still-dominant scientific paradigm, and case studies are useful both for theory building and for research situations that are highly contingent on contextual influence.

In a social constructionist paradigm, case studies are a primary form of research, not a subordinate one. As Chen and Pearce (1995) noted about the Deweyian perspective, knowledge of specificities of cases can develop participative intelligence. Many CMM studies are done in the case study/action research paradigm. In this case, the research design was not intended to advance the participative intelligence of the participants while interacting in the process of research, but rather to capture and describe their participative intelligence while they were engaged in their project, which had near and long term future implications for the parties involved. When I designed this study, I saw that the phenomenon I wanted to plumb could be done in a variety of methods: ethnomethodology, case study, and action research. At various points in the study’s implementation when I interacted with the

participants, I wanted this study to be an action research one as it was a better fit for my inclinations. However, I thought the literatures would be more enriched from a case study/observer first to tease out the conversational conditions and then subsequently to test those conditions with an action research or other methodological treatment. Thus, I traded the potential usefulness of this research for the participant for the potential of theoretical depth.

Data gathering fit with conceptual framework. The data-gathering and analyzing methods employed fit with the conceptual framework of a social constructionist case study but were painstaking when it came to noting the specificities so that the specific conversational conditions discerned captured the highly emergent nature of the phenomenon. The majority of the data capture was made by video-recordings with the researcher absent so that the participants' focus and conversational flow on the creative matters at hand would be undisturbed in the process. Yet, while the video-recording was not an impediment to collaborative conversation, video-conferencing was. The reflective interviews were audio-recorded within two months of finishing the project and were made with the assumption that the participants could provide relatively accurate retrospective accounts of their interpretations and thoughts at certain points of the transcribed conversational analysis accounts of interactions. Retrospective accounts are more limited than actual in-the-moment check-ins of what someone interpreted, assuming that even then a participant would courageously say the interpretation that was on the top of their mind. Therefore, the live check-in that I did with participants during the Group Educational Session, which was audio-recorded, allowed me to more deeply discern patterns of interconnective meaning various

participants were making and reporting between their retrospective accounts in the interviews and by comments and demeanor live during the Group Educational Session.

Although this study was not in the action research modality, which would have placed reflexivity more as a central function, the study design used reflective questions about the process of their cocreation of design solutions for Distinctive Greetings in a questionnaire, in the Group Education Session, and in the final interviews. Reflexive loops put the system in communication with itself, and that is always beneficial (Rogers, 2009; Wheatley & Kellner-Rogers, 1996; Wolf, 2011). People remarked that the group educational session provided a way for them to examine their underlying assumptions about when they participated and did not, the unarticulated rules by which they engaged, what they privileged and did not, and how they experienced their engagement and even avoided participation. Most significantly and paradoxically, the final in-person session created the quality of engagement and opportunities for establishing affinity and relationship that was missing the entire semester. Within that framework, the group educational session provided a means for the groups to reflect on and complete the semester's process through the examination of the vignette and the difficulties in giving and receiving critique and feedback with more dignity and appreciation than would have been available otherwise.

Analysis fit with conceptual framework. The CMM four-function, eight-step analysis framework fit the communication perspective of CMM theory. Two other analysis approaches were also used: conversational analysis and figurative language usage perspective. Using these three analytic approaches provided a triple check for emergence. Analysis was reflexive and reiterative between the methods used, and in the observations of the speakers and listeners, so that I could discern meaning shifts while in the making. The

conversational analysis transcripts were highly detailed about the social and affective dynamic with the paralinguistic features of both speakers and listeners to counter-balance the criticism that transcripts ignore how much of the message was sent by body language, facial expressions, eye contact, intonations, emotion, and humor (Gorse & Emmitt, 2005, p. 110). The coding scheme was intentionally kept to simple observations as to provide robust data (Gorse & Emmitt, 2005), and the critical question “What is really going on here?” was constantly referenced during my analysis and applied to every one of my topic/coding scheme categories. After explaining the coding scheme, I had a college-student research assistant code each turn of each vignette separately from me and then we compared codes. In cases where we disagreed, I would reexamine the relevant sections of the videotape, reassess our respective codes from a renewed perspective, and then assign the code I thought most appropriate.

The drawbacks to using three analytic approaches was the complexity and time intensiveness this required; I kept wanting to find better ways to analyze more quickly, and did not think that software programs currently available would fit the complexity of the data or the CMM approach. In addition, it made the linkage between the findings and the supporting evidence hard to discern, for the finding would often be supported by various aspects of each method of analysis and then synthesis.

Criteria for evaluating research. By design, the results of this study were more exploratory, illustrative, and suggestive than declarative and definitive. Yet, as a case study and for the purpose of isolating conversational conditions, the size of the group was more than ample to reveal the polysemic and layered meaning making that happens within group creative process.

To make a generalized statement that this is how all creative breakthroughs are made would require more research, wider sampling, and populations that are more similar in domain competencies, and over a longer time frame of one month of analyzed data. Deliberate choices on sample size (10), vignettes analyzed (three), time frame (1 month/April 2012) were made to limit the research design so as to make it manageable for dissertation research.

Chen and Pearce (1995) suggested that the criteria used for communication science paradigms is incommensurate for the evaluation of research in other paradigms (V. Chen & Pearce, 1995). Instead, they recommended the following criteria for a reader's evaluation of a constructionist case study, accompanied by orienting questions for the reader (Chen & Pearce, 1995, pp. 140-154):

| Criteria | Orienting Question for Evaluation |
|--------------------|--|
| Coherence | <i>Does this make sense for the reader? Is it intelligible to the informants?</i> |
| Intelligibility | |
| Richness | <i>Are there patterns of connection and distinctions amongst all relevant aspects of the story? Are there inconsistent and contradictory instances which indicate significant forms of relationship? Is polysemy evident?</i> |
| Comprehensiveness | |
| Interconnectedness | |
| Probability | <i>Are the interpretations historically and situationally conscious?</i> |
| Plausibility | |
| Open-endedness | <i>Are the readers invited to think beyond the text and offer different interpretations?</i> |

Figure 11. Evaluative criteria for constructionist case study research, .
Based on Chen and Pearce, 1995, pp. 140-15.

This study joined the conversation in the literature addressing approaches that engage collaboration as a social process and cognition as a highly subjective process. How these processes affected each other was explored using the communication perspective of social constructionist communication theory, as the construction of new meaning is central to the joint construction of subjectivities, social worlds, and outcomes. Yet, as Richard Carrick (2013), a composer, warned, discerning a pattern of conversational conditions for creative breakthroughs is not equal to predictive validity, since conversational patterns may be in constant flux with new meaning's emergence as participants transform ideas in tandem with their collaborative efforts (Carrick, 2013). Although this study might meet the above standards for good research, it could definitely be improved upon.

Qualifications on the Conclusions of the Study

Although the six findings add to the understanding of what conversations contribute to creative breakthrough emergence, they in and of themselves help explain only some aspects of creative, collaborative process. Not all creative conversations produce creative breakthroughs; they could also solve problems, expand the sociability of the groups, and make improvements to the matter of concern. There are two aspects that make these findings different and distinctive from common assumptions about creative conversations. The first is that these specific conversational patterns (Findings 1-6) were in combination with one another for a whole conversational enactment. The second most notable aspect of these specific conversational patterns is that, in the final weeks of April, the participants caused creative breakthroughs to occur, not just improvements or tweaks. It was also entirely possible that these specific conversational patterns were not the only ones that produced creative breakthroughs, furthermore determining that the most necessary specific

conversational conditions for creative breakthrough is outside the scope of this particular study. As an exploratory case study, these six findings extend and deepen our understanding of what it might take to produce creative breakthroughs in collaborative group conversations.

This constructionist case study is not without its limitations. Given the exploratory and emergent nature of this case study, the findings are significant even with their limitations, as was discussed above. However, this study would be strengthened if the following limitations were addressed in research subsequent to this study. The major qualifications of this research are the selection of a stable, and more co-equal collaborative project workgroup to study, and the establishment of the veracity and strength of the creative breakthrough moments.

Selection of a stable collaborative project workgroup. As mentioned in Chapter 3, the shifting organizational conditions for this project shifted the study's collaborative workgroup (singular) focus. Since one of the primary contributions of this study was its in vivo nature, and how things happen that one cannot plan for, the six specific conversational conditions would have more probability if the groups under study had more history working as one workgroup. In this study, the group centric intention was shifted to a group's focus on individuals within the group rather than the group generating creative breakthroughs as a whole group, from the whole group and for a whole group design.

Additionally, the Distinctive Greetings Project participants had a high degree of sensitivity between the groups about what they should and should not say to each other. With the researcher, most commented that while they knew their interactions were recorded, after they met me once, online, they were not concerned about my viewing and interpreting their interactions. In any group, people are usually concerned about what they shouldn't and

should say in accordance with their contextual interpretations of role, position, authority, competency, etc. The CMM heuristic of logical force can even be an excellent way of investigating those interpretations for a better resolution for possibility and action. Yet, in this study, because there was such inequality in terms of participant competency, investment in the project, and a gap in relationship, I could not help but wonder whether the relational findings of Finding 2 and 3 would have emerged had the study been conducted with two groups of more equal stature, with some history, and similar investment in the project.¹⁶¹ The study's design and my role as a researcher precluded using the heuristic of logical force to help intervene on the groups' sensitivity.

Veracity and strength of the establishment of the creative breakthrough moments. As was discussed in the Findings Chapter, the approach I took to discover the conversational conditions that facilitated creative breakthroughs was to first discern the creative breakthroughs emergent from the groups' participation. This could be improved upon in two ways.

The first limitation that could be improved is to ensure more penetrating consistency of the participant's identification of creative breakthroughs with the reflective questionnaire instrument. The reflective, anonymous questionnaire that I relied upon for the participant's insight as to the promising creative interactions and moments to review was only responded to one week out of four by the C4 group. Although the questionnaires served several functions such as encouraging reflection amongst the participants on the process they were engaged in, and gave an opportunity to assess progress, they did not serve the main purpose to identify creative breakthrough moments. Improvements I would recommend would be to

¹⁶¹ Findings 2 and 3, the specific conversational conditions of relationship/connection/letting go and taking responsibility for the impact of your actions on others.

(a) use a reflective, anonymous feedback instrument throughout the entire course of a collaborative group's creative project together;

(b) use the reflective instrument when either subgroup meets separately (and I had not asked the Levenger or the C4 groups to do this); and

(c) use more direct questions in the instrument itself so that unguarded responses of participants' reactions to the creative emergence in the weekly process could be obtained. In my concern to not ask leading questions that would skew the emergence data, the four questions I used elicited vague and generalized responses.

Although I have made the case that social constructionist case studies need to be evaluated with other criteria than more positivist research, this study would have been enriched had I made a comparison between the non-breakthrough interactions with the breakthrough interactions to more verify that the six facilitative specific conversational conditions were necessary for creative breakthrough emergence. My reasons for not doing so were influenced by manageability concerns of cost and time for this dissertation research. As it was, the amounts of data gathered by the research instruments and three methodological approaches were copious for one vignette episode, much less three.

Overall, the design served the purposes of the study. Despite the laboriousness of the three analytical methodologies, the six facilitative, conversational conditions for creative breakthrough emergence provided a fertile foundation for future research and testing. I think the observational results of this study, using the CMM conceptual framework to guide inquiry and the CMM methodological framework for analysis and synthesis, was valuable for individual, organizational, and meta-reflections for groups that must generate, create, and

innovate. Before I discuss further research, I add a post-script on the project conditions of this case study.

Post-Script: “It Could Have Been Otherwise.” This research design deliberately focused on the micro and not the more macro organizational conditions to determine the conversational conditions that facilitated creative breakthroughs in a collaborative setting to manage the scope of this research project. Yet, according to the CMM theoretical framework that informed my research methodology and overall constructivist perspectives, the organizational contexts in which these design sessions occurred influenced and shaped what happened and did not happen in this project. The general conversational conditions constrained the facilitative conversational patterns in the project.

The general conversational conditions of the Distinctive Greetings project in part grew out of the default evolution of overall project’s design. To remind the reader, the four general conversational conditions of the project were that

1. Two definite groups, rather than one “Distinctive Greetings” focused team were in response to individual, separate student projects in a classroom setting;
2. Design concepts were developed in a present-critique-modify discursive pattern of communication;
3. There was a felt disparity and hierarchy experience between the groups; and
4. Dissatisfaction and difficulties with the videoconference tool were experienced consistently during the semester.

The two-group, rather than one-group conversational pattern, was so remarkable that I reasoned I had to reflect it that way in the CMM serpentine conversational maps (Appendices M1a-c and M2a-c) to remain faithful to the context of what I observed in their

communication style. As Pearce (2007) said, the employment of turns makes a difference in how the story of an interaction or a happening is told, as well as how it is understood. Tulip characterized the collaboration this way,

[This project] was not the most ideal collaboration experience for you to observe because it felt like the purest forms of collaboration were when the individual teams were building off each other and it was more what you were observing is like across the great divide, having these half-time critics come in, and it wasn't real and it didn't feel like a real collaboration.

This general condition, as well as the others in combination, made achieving breakthroughs a more difficult process. Instead of general conditions, or organizational conditions enabling productive interactions, these general conversational conditions combined to make this Distinctive Greetings Project a testing of creative collaborative skill-sets by setting up some members to play the role of individual creators of ideas or content generators, and other members to acts as “critics” of others’ ideas, as Tulip noted. In part, this was due to the devolvement of the project’s framework in terms of unclear organizational objectives and definitions of success and the project’s organization (e.g., division of labor, role responsibility, design process pathway, and communication agreements over the course of the project).

The four general contextual conditions did in fact produce logical forces that served as obstacles to group collaboration and made achieving breakthroughs a more difficult process. In each vignette, negative pre-figurative/contextual force patterns expressed as confusion, frustration, and impatient interruption between the Levenger participants and C4 had to be overcome in order to more mindfully attend to the design tasks at hand. The creative need to let go of prior conceptualizations and assumptions so as to be available for new perspective taking and making thus became secondary to the socio-affective need to let

go of relational assumptions that blocked co-action first. The constant presence of these negative logical forces may have helped develop the emergence of Findings 2 and 3, that deliberate relational moves were made to facilitate the letting go, and that relational responsibility shown towards the other established a pattern of bifurcation point associations with creative breakthrough emergence. Had these contextual conditions been otherwise and a collaborative structure of the project more mindfully maintained rather than assumed, resource areas for design acuity could have been utilized more fully, thus enabling the possible making of better design product conceptualizations and future possibilities.

Further Research

To broaden and deepen knowledge of the phenomenon of creative breakthrough emergence in collaborative workgroups, further research is called for since this was an exploratory study. During the course of the study, opportunities for further inquiry arose that were associated with aspects of this study as well as curiosities not directly supported by the data but relevant to the problem.

Opportunities. One of the most obvious immediate opportunities for further research is to verify whether the six specific conditions for creative breakthrough emergence in collaborative groups found in this study are discerned in other collaborative workgroups, using different investigative methodologies and different populations.

The phenomenon of conversational conditions facilitative to creative breakthrough production would be enriched further if future studies had a more representative balance of men to women, and of different sociocultural heritage, as the findings from this study were based mostly on the interactions of women, although Professor Robinson's and Rick's participations were present throughout. Further testing of the creative collaborative

conversational model in other cultures and countries as well as a different age range of participants (e.g., high school and middle school students) would significantly add to knowledge. Although I think that further research with designers is one of the most fertile fields for knowledge creation about the phenomenon of creative breakthroughs in groups, conducting similar research with adult professionals where creative thought is needed under frequent pressure, such as scientific and technical fields, would test the validity of these findings and further the usefulness of this research to populations most affected.

Another useful refinement would be to conduct any verification studies with a research design modification of examining the nonbreakthrough moments. While I would predict that the social force patterns of nonbreakthrough moments would not include implicative force, verification would be illuminating and lead to further research.

To expand the findings relevancy for both knowledge and practice, conducting a similar study with design professionals with a CMM conceptual framework in an action research methodological framework could simultaneously provide further benefit to the participants as well as increase knowledge. Action research would enable the researchers to verify and refine the meaning-making claims of this study, as inquiry could be conducted in the moment and not rely on latter accounts. Although this study primarily focused on language action and certain dimensions of meaning creation, it did not utilize the CMM theoretical conception of mystery to explore meaning making and action. A study including mystery as another conceptual lens with the action research paradigm could better penetrate the phenomenon and be more in alignment with CMM research traditions. Additional research and testing of this possible contribution to CMM research and practice would be

welcomed, for the establishment of signposts for wanted repetitive patterns could then further advance the practical contributions of CMM theory and practice.

Another obvious avenue for further research would be deeper investigation into the six conversational conditions outlined above to better determine the most facilitative and most hindering features of each. For instance, this study did not explore the different nuances of the kinds of critique used, and that would be a fruitful avenue to pursue since critique and criticism is either elevated for creative purpose or tolerated in many workgroup situations. For design education and design practice, further research as to the use of critique for creative potential might be worthwhile. Although critique is ubiquitous within that profession, the artful use of it to facilitate creative breakthroughs may not be. Utilizing ethnomethodology and phenomenological approaches would maintain a focus on new meaning creation and deepen understanding about the associative power of critique in small group interaction. To broaden the veracity of these findings, a more positivistic study, based in either survey data or a mixed methods approach using portable fMRI devices in a larger sample, with different sub-populations for creative endeavor, would also be fruitful.

Critique, connection, relationship, and relational responsibility were vital to the expansion of idea, possibility, story, and design in this study. There is a debate in the literature about the degree to which relationship and close ties either facilitate or hinder creative endeavor (Baer, 2010; Vera John-Steiner, 2000; Wuchty, Jones, & Uzzi, 2007). This study raises questions about what kind and how much relational responsibility conversations are needed to push the boundaries for creative breakthroughs and innovation. In what ways do critique and challenge grow in proportion to the presence of relationship, and how much relationship needs to be present? In what ways does the presence of former relationships

hinder conversations that could push the boundaries of what is possible in the current interaction? How do relationships and relational responsibility conversational patterns strengthen from critique, and what kinds of critique? From an interview, Wendy also raised the question of how much relational responsibility should be assumed for another's growth and development when delivering feedback and critique. This last inquiry has more implications for workgroups who are on more of unequal footing, and one group assumes a role of mentoring or educating the other. This would have practical implications for the design field as well as for more organizational contexts.

Further curiosities about the reflexive nature of collaboration and creativity in groups. This study expanded theorizing about certain concepts such as creative breakthroughs and generous listening from a psychological or intrapersonal construct to a narrative and social construct, as evidenced by the conversational conditions the groups accessed when they were in the process of absorbing critique and reframing a design problem contemporaneously with proffered design solutions. The social relationships between the groups and between group members were continuously defined and redefined as they co-designed their design stories, thus also evolving new stories about groups (Wasserman, 2004). Yet the stories the groups had about each other and groups in creative collaboration were not explored in depth and further research specifically on that question would benefit the creative collaboration literature and organizational theory, especially the organizational change dimension. Most useful would be how those group stories aided or hindered the future of their organizational endeavors. The willingness and ability to engage in creative destruction and construction with others seems close to the core of continued vitality and viability of organizations.

During the course of my data gathering and analysis, I often had to refocus on the research question, for I would find myself engaged in wondering about the collaborative effects on group creativity. Additionally, the participants mentioned in interviews that knowing more about how to better collaborate while mutually engaged for creative production would be vital for their concerns as designers as they interacted with various populations, with different levels of investment, openness, and experience in design conversations. Studies that that would take the inverse of my question--“What are the conversational conditions that facilitate collaborative breakthroughs in creative workgroups?”--would provide a comparative value to this study’s findings and begin to address whether creative and collaborative breakthroughs are mutually dependent, simply contiguous, or sequential? Although Sawyer (2006) and others have argued that collaboration is the most conducive condition for creativity, the identification of conversational conditions associated with collaborative breakthroughs and their relationship to heightened levels of creativity that occur more in everyday practice than improvisational drama and jazz performance would be useful.

Although others have used semantic approaches to study design (Dong, 2007) and the role of affect in creative minds (Dong, 2011), learning how emotional contagion in conversational practice drives creative breakthrough emergence and design would add to the literature. One of the advantages of using the detailed conversational analysis of the speakers’ and listeners’ interactions in this study was to view and hopefully account for the social, affective, and cognitive experience of persons-in-communication. Yet, in doing so, I was constantly aware that with perhaps another research design, more of the contagion factors from one participant to another could be captured, adding deeper understanding.

Utilizing the social-affective dictionary approach developed by Cynthia Whissel (Whissell, 2009) would add to the body of knowledge about what socio-emotive communication practices help creative breakthrough production. Using this approach to further test the findings from this study as well as to more deeply understand how they operate could also enrich organizational change theory, design research and practice, and innovation.

Summary of reflections on method, use, limitations, and calls for further research. Creative breakthrough moments and experience were in dynamic motion,¹⁶² provisional, and highly contextual amongst the project's participants in relationship with an idea and each other in the generation of new meaning and usefulness. From a pragmatic and social constructionist tradition, the making of meaning is a socially reflexive product between the persons in the interaction as well as the persons with continually shifting contexts and backgrounds they bring to the conversation and reference while in conversation (V. Chen & Pearce, 1995). Therefore, meaning making could be construed as always unfinished, inviting other witnesses to it to think beyond the content to create a different interpretation.¹⁶³ While this study could be improved upon, and calls for further research, I see a remarkable goodness of fit between the conceptual framework of CMM, the research methodologies of CA, CMM, and figurative language with the research phenomenon, the question, and the design used.

Implications for Practice

The CMM research methodology outlined in Chapter 3 summarizes the last step of the research pathway as one of scholarship and practice (see Table 7, CMM Eight Research

¹⁶² As described above, in a social-affective-cognitive dynamic.

¹⁶³ Ironically, Samantha's creative breakthrough moment was in a witness modality, when she watched Professor Robinson and C4 interact about an aspect of her design and realized she needed to shift her attention to the client and his concerns as she reported in an interview.

Steps in Four Functions). CMM has been and continues to be developed as a practical theory, and one that has transformational aspects for the evolution of a better social world (J. Barge & Pearce, 2004; J. K. Barge, 2006; J. K. Barge & Oliver, 2003; J. Kevin Barge, Simpson, & Shockley-Zalabak, 2008; V. Cronen, 2001; W. Pearce & Pearce, 2004; W. B. Pearce, 2007). Applications in the world of practice are as important as theoretical contributions.

The most practical and useful application of these findings is with the collaborative conversational model (Figure 9). The most likely audience for the use of the model would be practitioners in the fields of designing conversations, organization practitioners who are concerned with facilitating organization change and advancing innovation and new futures, and designers and design educators who must integrate practical, professional performance with theoretical design. The suggestions that follow are by nature initial, and some of them may not be easily implemented or fully applicable as suggested below since the application value has not been tested.

Designers of Conversations

Creative breakthroughs are often desired in all kinds of group situations where new, simultaneous emergence of social, affective, and cognitive perspectives from group members are needed in times of transition and uncertainty. This could be in personal groupings as well as professional groupings. The use of the creative collaborative conversational model in both arenas could promote greater collaborative experience in shared doing versus the use of positional power. Additionally, the use of the model could elicit more and better participation to get at the sociocultural nuances that may be lurking in the shadows, needing the group's attention for articulation and action.

In professional groupings, designers of conversations could be those that have to work or liaise with stakeholders, clients, and/or representatives from other groups in a front-end creative process that will put a lot at stake for those affected by the implementation of a new direction or course of action. Likely candidates would be architects, engineers, urban planners, environmental use specialists, consultants, leaders, managers, and executives. While not directly stated in the above discussion of the model, it provided a cocreative way to affect creative breakthrough emergence in stressful and strained general conversational conditions. Following this model could be important for groupings where the conveners of the creative conversations have to involve other constituencies where having a voice and living with the resultant choices are important, such as city, county, and local governments in community and policy decisions.

Designers and design education. Professional designers and design education could use the model for the creative breakthrough output consistently desired amongst the various constituencies that engage in aspects of reflective practice during the codesign phases of a project. Creating the conversations for optimum design would more likely produce excellent or breakthrough design. Design has a dialogic context, and professional practice could embed dialogic practice as one of a designer's professional competencies. According to Inman and Thompson (2013) who cited Ford (1999), Marshak and Grant (2011), those who have developed a dialogic mindset use dialogue to help them organize and change (Inman & Thompson, 2013, p. 36). Because design practice has become the new darling of practitioner leading-edge thinking and approach for this last decade or more, the particular distinctions of different conversational conditions that make for good design may get lost in an assumptive morass that thinks, "Oh, we know how to consistently generate creative breakthroughs with

others because we are designers,” rather than critically examine, practice, and further distinguish a conversational discipline for creative breakthrough emergence.

The use and practice of the model for professional designers could also help bring other key social and affective assumptions about the creation of client relationships to the front of mind so more difference could be made. Because professional designers exist in a network of professional support and industry knowledge, the use of the model could aid them in remaining mindfully appropriate to which relationship from which timeframe they must privilege to co-evolve creative breakthroughs with others. Ownership of the co-design creative phase could be therefore more distributed, and the short-cutting of face-to-face design sessions due to time pressure would not be forfeited given the social and emotional linkage critical to the emergence of something breakthrough in nature.

For design educators, the use of the model also would elevate the dialogic importance of co-design and collaboration. Given that the model is a minimal improvisational structure, practical and professional performance contingencies could be better integrated and balanced with learning theoretical design. Students who learned and practiced the model would be better prepared for the relational responsibilities of professional designers that extend well beyond design solution generation into responsibility for the evolvment of clients’ futures. For both professional designers and design educators, the use of the model is compatible and not confining to design exploration and exploitation. It also could open and expand design educational curriculums that would include learning and designing from the communication perspective inherent in the CMM theoretical framework, as well as make practical sense for the world of design practice. Finally, the model helps to honor the professional standards of design as Kimbell warned (L. Kimbell, 2011; Lucy Kimbell & Street, 2009), while making

the design as an abstraction transferable amongst domains and as a distillation of creativity and generativity since the model was sourced in design conversations.

Organizational practitioners such as organizational change consultants and executive coaches. Organization scholar-practitioners as consultants and coaches design and facilitate or support meetings, conferences, sessions, or educative deliberative events so that more creative collaboration emerges. Utilizing the model as an improvisational structure for group possibility thinking could encourage the constructive sharing of challenge and critical perspectives. In practice, the Osborn guidelines for non-evaluative conversation during brainstorming to encourage possibility thinking often has had the opposite intended effect: it stops possibility thinking amongst the most seasoned participants for they regard the “no evaluation” admonition as unrealistic and immature since all creative choices and risks involve critical discernment and an apprehension of downstream consequences.

Further application of this study’s findings and notations about the use of figurative language, generative metaphorical use, relational responsibility moves, and the relational unit as the critical unit of analysis could also aid organizational development practitioners in not only guiding themselves in the facilitation of creative emergence with and for their clients, but also for the clients’ perpetuation of an improvisational and creative structure of communication practices that could be applied to any situation needing a creative breakthrough. Finally, applying the model would expand the horizon of practical access to creative breakthrough generation and implementation beyond brainstorming, so that the natural avenues into a creatively collaborative conversation can evolve with the group through any of the six doorways of the improvisational structure of the model.

Final Remarks

This case study generated new insights into what conversational conditions enable creative breakthroughs in collaborative workgroups, despite the way the work is organized, disappointments about the original intentions, role unclarity, and profound dissatisfaction with the experienced social limitations of the over the web modality. The insights are based on the communication approach to creativity in groups and social construction theory. The communication perspective shifted the focus from the content to what was done in the process of creating, mediated by the confluence of action and meaning in conversations.

References

- Abate, F. R. (Ed.) (1999) *The Oxford American dictionary and language guide*. New York, NY: Oxford University Press.
- Abercrombie, D. (1967). *Elements of general phonetics*. Chicago, IL: Aldine.
- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *The Journal of Personality and Social Psychology*, 43(5), 997-1013.
- Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of personality and social psychology*, 45(2), 357-376.
- Amabile, T. M. (1996). *Creativity in context: Update to "the social psychology of creativity."* Boulder, CO: Westview Press.
- Amabile, T. M. (2001). Beyond talent: John Irving and the passionate craft of creativity. *American Psychologist*, 56(4), 333.
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, 50(3), 367-403.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 1154-1184.
- Amabile, T. M., & Gryskiewicz, N. D. (1989). The creative environment scales: Work environment inventory. *Creativity Research Journal*, 2(4), 231-253.
- Amabile, T. M., & Gryskiewicz, S. S. (1987). Creativity in the R&D laboratory *Center for Creative Leadership Report* (pp. 30). Greensboro, NC: Center for Creative Leadership.
- Amhag, L., & Jakobsson, A. (2009). Collaborative learning as a collective competence when students use the potential of meaning in asynchronous dialogues. *Computers & Education*, 52(3), 656-667.
- Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Organizational*

Behavior, 19(3), 235-258. doi: 10.1002/(sici)1099-1379(199805)19:3<235::aid-job837>3.0.co;2-c

- Antaki, C. (2002, January 2011). An introductory tutorial in Conversational Analysis. *Discourse and Rhetoric Group*. from <http://www-staff.lboro.ac.uk/~ssca1/sitemenu.htm>
- Badke-Schaub, P. (2007). Creativity and innovation in industrial design: wishful thinking? *Journal of Design Research*, 5(3), 353-367.
- Badke-Schaub, P., Roozenburg, N., & Cardoso, C. (2010). *Design thinking: A paradigm on its way from dilution to meaninglessness*. Paper presented at the Proceedings of the 8th Design Thinking Research Symposium (DTRS8), Delft, Netherlands.
- Baer, M. (2010). The strength-of-weak-ties perspective on creativity: A comprehensive examination and extension. *Journal of Applied Psychology*, 95(3), 592-601. doi: 10.1037/0033-2909.103.3.411
- Bakhtin, M. M. (1986). *Speech genre's and other late essays*. Austin, TX: University of Texas Press.
- Barge, J., & Pearce, W. (2004). A reconnaissance of CMM research *The Journal of Systemic Consultation and Management*, 15(1), 13-32.
- Barge, J. K. (2006). Living systemic constructionist management research. *Human Systems: The Journal of Systemic Consultation and Management*, 17, 257-280.
- Barge, J. K., & Oliver, C. (2003). Working with appreciation in managerial practice. *Academy of Management Review*, 28, 124-142.
- Barge, J. K., Simpson, J. L., & Shockley-Zalabak, P. (2008). Introduction: Toward purposeful and practical models of engaged scholarship. *Journal of Applied Communication Research*, 36(3), 243-244. doi: 10.1080/00909880802190113
- Barrett, F. J. (1998). Coda--Creativity and Improvisation in jazz and organizations: Implications for organizational learning. *Organization Science*, 9(5), 605-622.

- Barrett, F. J. (2012). *Yes to the mess: Surprising leadership lessons from jazz*. Boston, MA: Harvard Business Review Press.
- Barrett, F. J., & Cooperrider, D. (1990). Generative metaphor intervention: A new approach for working with systems divided by conflict and caught in defensive perception. *The Journal of Applied Behavioral Science*, 26(2), 219-239.
- Baruah, J., & Paulus, P. B. (2009). Enhancing group creativity: The search for synergy. In E. A. Mannix, M. A. Neale & J. A. Goncalo (Eds.), *Creativity in groups (Research on managing groups and teams)* (Vol. 12, pp. 29-56): Emerald Insight Publications. Bingsley, UK. Retrieved from http://www-management.wharton.upenn.edu/mueller/docs/Mueller_Cronin_2009_chapter_relational_processes_group_creativity.pdf#page=42.
- Bateson, G. (1972). A theory of play and fantasy. In K. Salen & E. Zimmerman (Eds.), *The Game Design Reader* (Vol. 180, pp. 314-328). Cambridge, MA: The MIT Press.
- Bateson, G. (1978). The pattern which connects. *Co-Evolution Quarterly*, 18, 4-15.
- Bateson, M. (2005). The double bind: Pathology and creativity. *Cybernetics & Human Knowing*, 12(1-2), 11-21.
- Bauman, Z. (1995). *Life in fragments: Essays in postmodern morality*. Oxford, UK: Blackwell Publishers.
- Benedict-Nelson, A. (2012). Jam at a massive scale: Interview with Frank Barrett. *Insight Labs*. Retrieved December 27, 2012, 2012, from <http://www.theinsightlabs.org>
- Bennis, W. G., & Biederman, P. W. (1997). *Organizing genius: The secrets of creative collaboration*. Reading, MA: Addison-Wesley.
- Bennis, W. G., & O'Toole, J. (2009). What's Needed Next: A culture of candor. *Harvard Business Review*, 1-9.
- Berger, P. L., & Luckmann, T. (1967). *The social construction of reality*. New York, NY: Doubleday.

- Blong, L. (2008). *Making public deliberation: A study of moderator episode work at National Issues Forums*. (PhD Ph.D.), Fielding Graduate University, Ann Arbor. Retrieved from <https://fgul.idm.oclc.org/login?url=http://search.proquest.com/docview/304840433?accountid=10868> Dissertations & Theses @ Fielding Graduate University database.
- Boland Jr, R. J., & Collopy, F. (Eds.). (2004). *Managing as designing*. Stanford, CA: Stanford University Press.
- Boland Jr, R. J., & Tenkasi, R. V. (1995). Perspective making and perspective taking in communities of knowing. *Organization Science*, 350-372.
- Bonnardel, N. (1999). *Creativity in design activities: The role of analogies in a constrained cognitive environment*. Paper presented at the Proceedings of the 3rd Conference on Creativity & Cognition.
- Bonnardel, N. (2000). Towards understanding and supporting creativity in design: analogies in a constrained cognitive environment. *Knowledge-Based Systems*, 13(7), 505-513.
- Branham, R. J., & Pearce, B. (1985). Between text and context: Toward a rhetoric of contextual reconstruction. *Quarterly Journal of Speech*, 71, 19-36.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101. doi: 10.1191/1478088706qp063oa
- Brown, T. (2008). Design thinking. *Harvard Business Review*, 86(6), 84-94.
- Bruner, J. (1986). *Actual minds, Possible worlds*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard College.
- Bruner, J. (1991). The narrative construction of reality. *Critical inquiry*, 18(1), 1-21.
- Bucciarelli, L. L. (1988). An ethnographic perspective on engineering design. *Design Studies*, 9(3), 159-168.

- Buchanan, R. (2004). Management and design: Interaction pathways in organizational life. In R. J. Boland Jr & F. Collopy (Eds.), *Managing as designing* (pp. 54-64). Stanford, CA: Stanford University Press.
- Burleson, W. (2005). Developing creativity, motivation, and self-actualization with learning systems. *International Journal of Human-Computer Studies*, 63(4), 436-451.
- Burr, V. (2003). *Social Constructionism* (2nd ed.). New York, NY: Routledge.
- Buttny, R., & Jensen, A. D. (2002). Hot-stove league talk. In G. Gumpert & S. J. Drucker (Eds.), *Take me out to the ballgame: communicating baseball* (pp. 71-93). Cresskill, NJ: Hampton Press.
- Camacho, L. M., & Paulus, P. B. (1995). The role of social anxiousness in group brainstorming. *Journal of personality and social psychology*, 68(6), 1071.
- Carpenter, H. (2006). *Reconceptualizing communication competence: High performing coordinated communication competence (HP3) - a Three Dimensional view*. (PhD Dissertation), Fielding Graduate University, Santa Barbara, CA. Retrieved from <http://proquest.umi.com.ezproxy.fielding.edu/pqdlink?vinst=PROD&attempt=1&fmt=6&startpage=-1&ver=1&vname=PQD&RQT=309&did=1160041791&exp=04-18-2015&scaling=FULL&vtype=PQD&rqt=309&TS=1271735338&clientId=46781>
- Carrick, R. (Producer). (2013, April 20, 2013). The music of 'flow'. *Opinionator: The Score*. [Blog] Retrieved from http://opinionator.blogs.nytimes.com/2013/04/19/the-music-of-flow/?_php=true&_type=blogs&_php=true&_type=blogs&hp&_r=1&
- Casakin, H. P. (2011). Metaphorical reasoning and design expertise: A perspective for design education. *Journal of Learning Design*, 4(2).
- Casakin, H. P. (2012). An empirical assessment of metaphor use in the design studio: Analysis, reflection and restructuring of architectural design. *International Journal of Technology and Design Education*, 22(3), 329-344. doi: 10.1016/s0142-694x(01)00009-6
- Chandy, R. K., & Tellis, G. J. (1998). Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of Marketing Research*, 474-487.

- Chen, V., & Pearce, W. (1995). Even if a thing of beauty, can a case study be a joy forever. *Social approaches to communication*, 135-154.
- Chen, W., & Tang, H.-H. (2013). *Learning problems and resources usage of undergraduate industrial design students in studio courses*. Paper presented at the DRS//Cumulus 2013 Oslo, May 14-1, 2013.
- Christensenl, T., & Yaşar, Ş. (2007). *Paradigms and protocols in the study of creative collaboration: implications for research of design team process and product*. Paper presented at the International Association of Societies of Design Research, Hong Kong Polytechnic University. Conference Paper retrieved from http://www.sd.polyu.edu.hk/iasdr/proceeding/papers/Paradigms%20and%20Protocols%20in%20the%20Study%20of%20Creative%20Collaboration_%20.pdf
- Cole, M. (1991). Conclusion. In L. B. Resnick, J. M. Levine & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 398-417). Washington, DC: American Psychological Association.
- Craft, A. (2005). *Creativity in schools: Tensions and dilemmas*. New York, NY: Routledge.
- Creede, C. (2008). *Relational eloquence: Identity stories and conversational practices in relationally generative interaction*. (PhD Dissertation & Theses), Fielding Graduate University, Santa Barbara, CA. (9780549921080)
- Cronen, V. (2001). Practical theory, practical art, and the pragmatic-systemic account of inquiry. *Communication Theory*, 11(1; February), 14-35.
- Cronen, V. E. (2004). Something old, something new: CMM and mass communication. *Human Systems: The Journal of Systemic Consultation and Management*, 153(4), 167-178.
- Cronen, V. E., Pearce, W. B., & Snavely, L. (1979). A theory of rule-structure and types of episodes and a study of perceived enmeshment in undesired repetitive patterns ("URPs"). *Communication yearbook*, 3, 225-240.
- Cross, N. (1982). Designerly ways of knowing. *Design Studies*, 3(4), 221-227.
- Cross, N. (1997). Creativity in design: Analyzing and modeling the creative leap. *Leonardo*, 311-317.

- Cross, N. (2001a). Design cognition: Results from protocol and other empirical studies of design activity. In C. Eastman, W. Newsletter, & M. McCracken (Eds.), *Design knowing and learning: Cognition in design education* (pp. 79-103). Kidlington, Oxford, UK: Elsevier Science Ltd.
- Cross, N. (2001b). Designerly ways of knowing: Design discipline versus design science. *Design issues*, 17(3), 49-55.
- Csikszentmihalyi, M. (1988). Society, culture, person: A systems view of creativity. In R. J. Sternberg (Ed.), *The nature of creativity* (pp. 325-339). New York, NY: Cambridge University Press.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: Harper-Collins Publishers.
- Dahl, D. W., & Moreau, P. (2002). The influence and value of analogical thinking during new product ideation. *Journal of Marketing Research (JMR)*, 39(1), 47-60.
- Denning, P. J., & Dunham, R. (2006). Innovation as language action. *Communications of the ACM*, 49(5), 47-52.
- Denzin, N. K. (2000). Forward. In M. Andrews, S. D. Sclater, M. Rustin, C. Squire & A. Treacher (Eds.), *Lines of narrative: Psychosocial perspectives* (pp. xi-xiii). New York, NY: Routledge.
- Dewey, J. (2012). *How we think*. San Bernadino, CA: Renaissance Classics.
- Diehl, M., & Stroebe, W. (1987). Productivity loss in brainstorming groups: Toward the solution of a riddle. *Journal of personality and social psychology*, 53, 497-509.
- Diehl, M., & Stroebe, W. (1991). Productivity loss in idea-generating groups: Tracking down the blocking effect. *Journal of personality and social psychology*, 61(3), 392.
- Dong, A. (2004a). *Design as a socio-cultural cognitive system*. Paper presented at the International Design Conference 2004, Dubrovnik.
- Dong, A. (2004b). Quantifying coherent thinking in design: A computational linguistics approach. *Design computing and cognition*, 4, 521-540.

- Dong, A. (2005). The latent semantic approach to studying design team communication. *Design Studies*, 26(5), 445-461.
- Dong, A. (2006). Concept formation as knowledge accumulation: A computational linguistics study. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, 20, 30-53. doi: 10.1017/S0890060406060033
- Dong, A. (2007). The enactment of design through language. *Design Studies*, 28(1), 5-21. doi: 10.1016/j.destud.2006.07.001
- Dong, A., Davies, K., & McInnes, D. (2005). *Exploring the relationship between lexical behavior and concept formation in design conversations*. Paper presented at the ASME 2005 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Long Beach, CA.
- Dong, A., Hill, A. W., & Agogino, A. M. (2004). A document analysis method for characterizing design team performance. *Journal of Mechanical Design*, 126(3), 378-385.
- Dunbar, K. (1997a). How scientists think: On-line creativity and conceptual change in science. In T. Ward, S. M. Smith, & J. Vaid (Eds.), *Creative thought* (pp. 461-494). Washington, DC: American Psychological Association.
- Dunbar, K. (1997b). How scientists think: On-line creativity and conceptual change in science. In T. Ward, S. Smith, & J. Vaid (Eds.), *Creative thought: An investigation of conceptual structures and processes* (2001 ed., pp. 461-493). Washington, DC: American Psychological Association.
- Dunbar, K. (2001a). The analogical paradox: Why analogy is so easy in naturalistic settings yet so difficult in the psychological laboratory. In D. Gentner, K. J. Holyoak, & B. N. Kokinor (Eds.), *The analogical mind: Perspectives from cognitive science* (pp. 313-334). Cambridge, MA: MIT Press.
- Dunbar, K. (2001b). What scientific thinking reveals about the nature of cognition. In K. Crowley, C.D. Schunn, & T. Okada (Eds.), *Designing for science: Implications from everyday, classroom, and professional settings*, (pp. 115-140). Mahwah, NJ: Lawrence Erlbaum Associates.
- Dunbar, K., & Blanchette, I. (2001). The in vivo/in vitro approach to cognition: The case of analogy. *Trends in cognitive sciences*, 5(8), 334-339.

- Edmondson, A. (2012). Teamwork on the Fly. *Harvard Business Review*, 90(4), 72-80.
- Edmondson, A. C. (2012). *Teaming: How organizations learn, innovate, and compete in the knowledge economy*. San Francisco,CA: John Wiley & Sons.
- Elder, L., & Paul, R. (2007). Analytic thinking: How to take thinking apart and what to look for when you do (Vol. 595m, pp. 1-52). Dillon, CA: The Foundation for Critical Thinking.
- Eneberg, M. (2011). *The enabling service of the industrial design consultancy*. (PhD), Lund University, Lund, Sweden. Retrieved from http://designfakulteten.kth.se/sites/default/files/eneberg_the_enabling_service_of_the_industrial_design_consultancy.pdf (ISBN 978-91-7473-214-6)
- Epley, N. (2014). *Mindwise: How we understand what others think, believe, feel, and want*. New York, NY: Random House LLC.
- Etelapelto, A., & Lahti, J. (2008). The resources and obstacles of creative collaboration in a Long-Term Learning Community. *Thinking Skills and Creativity*, 3(3), 15.
- Ferreira, D., & Santos, G. (2011). Productive discussions for online collaborative creativity. *Repositório Científico do Instituto Politécnico de Santarém Revista Interações*, 7(17), 189-207.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117-140.
- Flaherty, J. (2005). *Coaching: Evoking excellence in others*. Oxford, England: Elsevier Publishing.
- Fleming, L. (2007). Breakthroughs and the "Long Tail" of Innovation. (cover story). *MIT Sloan Management Review*, 49(1), 69-74.
- Fleming, L., Mingo, S., & Chen, D. (2007). Collaborative brokerage, generative creativity, and creative success. *Administrative Science Quarterly*, 52(3), 443-475.
- Flores, F., Letelier, M. F., & Spinosa, C. (2003). Developing productive customers in emerging markets. *California Management Review*(Summer), 1-40.

- Forlizzi, J., & Ford, S. (2000). *The building blocks of experience: an early framework for interaction designers*. Paper presented at the Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques, Brooklyn, NY.
- Gammelgaard, J. (1998). Metaphors of listening. *The Scandinavian Psychoanalytic Review*, 21(2), 151-167.
- Gassmann, O., & Zeschky, M. (2008). Opening up the solution space: The role of analogical thinking for breakthrough product innovation. *Creativity and Innovation Management*, 17(2), 97-106.
- Genter, D., Brem, S., Ferguson, R., Wolff, P., Markman, A. B., & Forbus, K. (1997). Analogy and creativity in the works of Johannes Kepler. In T. Ward, C. E. Smith, & J. Vaid (Eds.), *Creative thought: An investigation of conceptual structures and processes* (pp. 403-460). Washington, DC: American Psychological Association.
- Gentner, D., Bowdle, B., Wolff, P., & Boronat, C. (2001). Metaphor is like analogy. In D. Genter, K. J. Holyoak & B. N. Kokinov (Eds.), *The analogical mind: Perspectives from cognitive science* (pp. 199-253). Cambridge, MA: MIT.
- Giddens, A. (1979). *Central problems in social theory: Action, structure and contradiction in social analysis*. Berkeley, CA: University of California Press.
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration* (2nd ed.). Berkeley, CA: University of California Press.
- Giddens, A. (1993). *New rules of sociological method: A positive critique of interpretative sociologies*. Stanford, CA: Stanford University Press.
- Gilson, L. L., Lim, H. S., D'Innocenzo, L., & Moye, N. (2012). One size does not fit all: Managing radical and incremental creativity. *The Journal of Creative Behavior*, 46(3), 168-191. doi: 10.1002/jocb.12
- Glăveanu, V. P. (2011). How are we creative together? Comparing sociocognitive and sociocultural answers. *Theory & Psychology*, 21(4), 473-492.
- Glunk, U. (2004). Book review of P. Paulus and B. Nijstad (2003) *Group creativity: Innovation through collaboration* and Sawyer (2003) *Group creativity: Music, theater,*

- collaboration. *European Journal of Work and Organizational Psychology*, 13(2), 301-304. doi: 10.1080/13594320444000100
- Goldsmith, R., Hebabi, L., & Nishii, A. (2010). *How practitioners use CMM*. Human and Organizational Development. Fielding Graduate University. Los Angeles, CA. Retrieved from <http://www.pearceandassociates.com>
- Gorse, C. A., & Emmitt, S. (2005). Small group interaction research methods. In S. Emmitt & M. Prins (Eds.), *Designing Value* (Vol. 96, pp. 103-113). Kongens Lyngby, Denmark: Technical University of Denmark.
- Gray, B. (1989). *Collaborating: Finding common ground for multiparty problems*. San Francisco, CA: Jossey-Bass Publishers.
- Green, A. E., Cohen, M. S., Kim, J. U., & Gray, J. R. (2012). An explicit cue improves creative analogical reasoning. *Intelligence*, 40(6), 598-603. doi: <http://dx.doi.org/10.1016/j.intell.2012.08.005>
- Grossen, M. (2008). Methods for studying collaborative creativity: An original and adventurous blend. *Thinking Skills and Creativity*, 3(3), 246-249.
- Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social development*, 10(1), 79-119.
- Hamel, G., & Prahalad, C. K. (1989). Strategic intent. *Harvard Business Review*(May-June), 13.
- Hara, N., Solomon, P., Kim, S. L., & Sonnenwald, D. H. (2003). An emerging view of scientific collaboration: Scientists' perspectives on collaboration and factors that impact collaboration. *Journal of the American Society for Information Science and Technology*, 54(10), 952-965.
- Hargadon, A. (1998). Firms as knowledge brokers. *California Management Review*, 40(3), 209-227.
- Hargadon, A. (2003). *How breakthroughs happen: The surprising truth about how companies innovate*. Boston, MA: Harvard Business Press.

- Hargadon, A., & Bechky, B. A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science*, 17(4), 484-500.
- Hargadon, A., & Douglas, Y. (2001). When innovations meet institutions: Edison and the design of the electric light. *Administrative Science Quarterly*, 46(3), 476-501.
- Hargadon, A., & Sutton, R. I. (1997). Technology brokering and innovation in a product development firm. *Administrative Science Quarterly*, 42(4), 716-749.
- Hargrove, R. (1997). *Mastering the art of creative collaboration*. New York, NY: McGraw-Hill Professional Book Group.
- Hasson, U., Ghazanfar, A. A., Galantucci, B., Garrod, S., & Keysers, C. (2012). Brain-to-brain coupling: a mechanism for creating and sharing a social world. *Trends in cognitive sciences*, 16(2), 114-122.
- Hayakawa, S. I., & Hayakawa, A. R. (1991). *Language in thought and action* (5th ed.). New York, NY: Houghton Mifflin Harcourt Publishing.
- Herring, S. R., Jones, B. R., & Bailey, B. P. (2009). *Idea generation techniques among creative professionals*. Paper presented at the 42nd Hawaii International Conference on System Sciences (HICSS-42), Honolulu.
- Hey, J., Linsey, J., Agogino, A. M., & Wood, K. L. (2008). Analogies and metaphors in creative design. *International Journal of Engineering Education*, 24(2), 283.
- Hosking, D. M., & McNamee, S. (2007). Back to basics: Appreciating appreciative inquiry as not 'normal science'. *AI Practitioner*, November, 12-16.
- Howard, R. A. (1988). Decision analysis: Practice and promise. *Management Science*, 34(6), 679-695.
- Hymes, D. (1964). Introduction: Toward ethnographies of communication. *American Anthropologist*, 66(6), 1-34. doi: 10.1525/aa.1964.66.suppl_3.02a00010
- Inman, J., & Thompson, T. A. (2013). Using dialogue then deliberation to transform a warring leadership team. *OD Practitioner*, 45(1), 35-40.

- Jensen, A. D., & Chilberg, J. C. (1991). *Small group communication: Theory and application*. Belmont CA: Wadsworth Publishing Company.
- Johansson, U., Holm, L. S., & Lojacono, G. (2009). *Patterns of interaction: A study of relations between designers, engineers, marketers and top management in four companies*. Paper presented at the International DMI Education Conference: Design Thinking, New challenges for designers, managers, and organizations, Paris, France. <http://www.dmi.org/dmi/html/conference/academic08/papers/Johannsen%20and%20Svengren%20Holm/Full%20paper%20Paris%2014%20Mar%20II.pdf>
- John-Steiner, V. (2000). *Creative collaboration*. New York, NY: Oxford University Press.
- John-Steiner, V., Weber, R. J., & Minnis, M. (1998). The challenge of studying collaboration. *American Educational Research Journal*, 35(4), 773-783.
- Johnson, S. (2010). *Where good ideas come from: The natural history of innovation*. New York, NY: Riverhead Books.
- Johnstone, B., & Marcellino, W. (2010). *Dell Hymes and the ethnography of communication*. Retrieved from http://works.bepress.com/cgi/viewcontent.cgi?article=1052&context=barbara_johnstone
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of personality and social psychology*, 65(4), 681.
- Keyton, J., Ford, D. J., & Smith, F. I. (2008). A mesolevel communicative model of collaboration. *Communication Theory*, 18(3), 376-406. doi: 10.1111/j.1468-2885.2008.00327.x
- Kimbell, L. (2009). The turn to service design. In G. Julier & L. Moor (Eds.), *Design and creativity: Policy, management and practice* (pp. 157-173). New York, NY: Berg.
- Kimbell, L. (2011). Rethinking design thinking: Part I. *Design and Culture*, 3(3), 285-306. DOI: <http://dx.doi.org/10.2752/175470811X13071166525216>
- Kimbell, L., & Street, P. E. (2009). *Beyond design thinking: Design-as-practice and designs-in-practice*. Paper presented at the CRESC Conference, Manchester, England.

- Kirkman, B. L., Mathieu, J. E., Cordery, J. L., Rosen, B., & Kuenberger, M. (2011). Managing a new collaborative entity in business organizations: Understanding organizational communities of practice effectiveness. *Journal of Applied Psychology*, 96(6), 1234-1245. doi: 10.1177/014920639101700108
- Kleinsmann, M., & Dong, A. (2007, September 4-7, 2007). *Investigating the affective force on creating shared understanding*. Paper presented at the ASME 2007 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Las Vegas, NV.
- Kleinsmann, M., & Valkenburg, R. (2005). Learning from collaborative new product development projects. *Journal of Workplace Learning*, 17(3), 146-156. doi: DOI (Permanent URL): 10.1108/13665620510588671
- Koestler, A. (1964). *The Act of Creation*. London, England: The Penguin Group.
- Koestler, A. (1967). The act of creation. In D. B. Lindsley & A. A. Lunsdaine (Eds.), *Brain Function and Learning*, (Vol. IV, pp. 327-346). Los Angeles, CA: University of California Press.
- Kohn, N. W., Paulus, P. B., & Choi, Y. H. (2011). Building on the ideas of others: An examination of the idea combination process. *Journal of Experimental Social Psychology*.
- Krippendorff, K. (2008). Social organizations as reconstitutable networks of conversations. *Cybernetics & Human Knowing*, 15(3-4), 149-161.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago, IL: The University of Chicago Press.
- Lawson, B. (2006). *How designers think: The design process demystified* (4th Edition ed.). Oxford, UK: Architectural Press.
- Leggett Dugosh, K., & Paulus, P. B. (2005). Cognitive and social comparison processes in brainstorming. *Journal of Experimental Social Psychology*, 41(3), 313-320.
- Lehrer, J. (2012, March 10, 2012). How to be creative. *Wall Street Journal* pp. 1-2.

- Leonard, D., & Swap, W. (1999). *When sparks fly: Harnessing the power of group creativity*. Boston, MA: Harvard Business School Press.
- Levi, S. V., & Pisoni, D. B. (2007). Indexical and linguistic channels in speech perception: Some effects of voiceovers on advertising outcomes. In T. Lowrey (Ed.), *Psycholinguistic Phenomena in Marketing Communications* (pp. 203-219). Mahwah, NJ: Lawrence Erlbaum Associates.
- Levine, J. M., & Moreland, R. L. (1991). Culture and socialization in work groups. In L. B. Resnick, J. M. Levine & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 257-279). Washington, DC: American Psychology Association.
- Levine, J. M., Resnick, L. B., & Higgins, E. T. (1993). Social foundations of cognition. *Annual review of psychology*, 44(1), 585-612.
- Lewis, L. K. (2006). Collaborative interaction: Review of communication scholarship and a research agenda. In C. S. Beck (Ed.), *Communication yearbook 30* (pp. 196-247). Mahwah, NJ: Lawrence Erlbaum Associates.
- Liikkanen, L. A., Laakso, M., & Bjorklund, T. (2011). *Foundations for studying creative design practices*. Paper presented at the Proceedings of the Second Conference on Creativity and Innovation in Design, Eindhoven, Netherlands.
<http://dl.acm.org/citation.cfm?id=2079260>
- Litchfield, R. C. (2008). Brainstorming reconsidered: A goal-based view. *The Academy of Management Review ARCHIVE*, 33(3), 649-668.
- Littleton, K., & Miell, D. (2004). Collaborative creativity: Contemporary perspectives. In D. Miell & K. Littleton (Eds.), *Collaborative Creativity: Contemporary perspectives* (pp. 1-10). London, England: Free Association Books.
- Lockwood, T. (2009). Transition: How to become a more design-minded organization. *Design Management Review*, 20(3), 28-37.
- Lockwood, T. (2010). Design thinking in business: An interview with Gianfranco Zaccai. *Design Management Review*, 21(3), 16-24.
- Lojacono, G., & Zaccai, G. (2004). The evolution of the design-inspired enterprise. *MIT Sloan Management Review*, 45(3), 75-79.

- Luomanen, J., & Peteri, V. (2013). iDeal machines and iDeal users: Domesticating iPad as a cultural object. *WiderScreen, January*.
- Marrs, P. C. (2007). *Fear as conversations gone-bad at work*. (Doctor of Philosophy Doctoral dissertation), Fielding Graduate University, Santa Barbara, CA. Retrieved from www.fielding.edu Available from ProQuest, LLC ProQuest database.
- Marrs, P. C. (2011, February 11, 2011). [Interview about Her Dissertation Topic and Process].
- Mascitelli, R. (2000). From experience: Harnessing tacit knowledge to achieve breakthrough innovation. *Journal of Product Innovation Management, 17*(3), 179-193. doi: 10.1111/1540-5885.1730179
- Mattelmäki, T., & Visser, F. S. (2011). *Lost in Co-X: Interpretations of co-design and co-creation*. Paper presented at the Diversity and Unity: Proceedings of IASDR2011, the 4th Conference on Design Research, Delft, The Netherlands.
- Mattessich, P. W., Murray-Close, M., & Monsey, B. R. (2001). *Collaboration: What makes it work*. St Paul, MN: Amherst H. Wilder Foundation.
- McNamee, S., & Gergen, K. (1999). An invitation to relational responsibility. In S. McNamee & K. Gergen (Eds.), *Relational responsibility: Resources for sustainable dialogue* (pp. 3-28). Thousand Oaks, CA: Sage.
- Mednick, S. (1962). The associative basis of the creative process. *Psychological review, 69*(3), 220-232.
- Miell, D., & Littlejohn, K. (Eds.). (2004). *Collaborative creativity: Contemporary perspectives*. London, England: Free Association Books.
- Montuori, A., & Purser, R. E. (Eds.). (1999). *Social creativity, Vol.1*. Cresskill, NJ: Hampton Press.
- Moran, S., & John-Steiner, V. (2003). Creativity in the making. In R. K. Sawyer, V. John-Steiner, R. J. Sternberg, D. H. Feldman, J. Nakamura & M. Csikszentmihalyi (Eds.), *Creativity and development: Counterpoints, cognition, memory and language* (Kindle eBooks ed., pp. 61-90). New York, NY: Oxford University Press.

- Moran, S., & John-Steiner, V. (2004). How collaboration in creative work impacts identity and motivation. In D. Miell & K. Littleton (Eds.), *Collaborative creativity: Contemporary perspectives* (pp. 11-25). London, England: Free Association Books.
- Morgan, G. (2006). *Images of organization* (Updated ed.). Thousand Oaks, CA: Sage Publications.
- Mumford, M. D., Baughman, W. A., Maher, M. A., Costanza, D. P., & Supinski, E. P. (1997). Process-based measures of creative problem-solving skills: IV. Category combination. *Creativity Research Journal*, *10*(1), 59-71. doi: 10.1207/s15326934crj1001_7
- Mumford, M. D., Hester, K. S., & Robledo, I. C. (2012). Creativity in organizations: Importance and approaches In M. D. Mumford (Ed.), *Handbook of organizational creativity* (pp. Location 350 to 801 of 25204). London, England: Academic Press, Elsevier.
- Murray, D. (2012). Interactional logics. In C. Creede, B. Fisher-Yoshida, & P. Gallegos (Eds.), *The reflective, facilitative, and interpretive practices of the coordinated management of meaning* (pp. 153-171). Madison, NJ: Farleigh Dickinson University Press.
- Murray, D. (2014). Navigating toward andragogy: Coordination and management of student-professor conversations *Western Journal of Communication*, *78*(3), 310-336.
- Nemeth, C. J., & Ormiston, M. (2007). Creative idea generation: Harmony versus stimulation. *European Journal of Social Psychology*, *37*(3), 524-535.
- Nemeth, C. J., Personnaz, B., Personnaz, M., & Goncalo, J. A. (2004). The liberating role of conflict in group creativity: A study in two countries. *European Journal of Social Psychology*, *34*(4), 365-374.
- Nijstad, B. A., Diehl, M., & Stroebe, W. (2003). Cognitive stimulation and interference in idea generating groups. In P. B. Paulus & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (pp. 137-159). New York, NY: Oxford University Press.
- Norman, D. A., & Verganti, R. (2012). *Incremental and radical innovation: Design research versus technology and meaning change*. Designing Pleasurable Produces and

- Interfaces Conference. Based on a talk by Norman and Verganti (2011) in Milan, Italy, 2011. Retrieved from www.google.com
- Nussbaum, B. (2011). Design thinking is a failed experiment. So what's next? Retrieved from <http://www.fastcodesign.com/1663558/design-thinking-is-a-failed-experiment-so-whats-next>
- Oliver, C. (2005). *Reflexive inquiry*. London, England: Karnac Books.
- Orlikowski, W. (2004). Managing and designing: Attending to reflexiveness and enactment. In R. J. Boland Jr & F. Collopy (Eds.), *Managing as designing* (pp. 90-95). Stanford, CA: Stanford University Press.
- Osborn, A. F. (1963). *Applied imagination: Principles and procedures of creative problem solving* (Third ed.). New York, NY: Charles Scribner's Sons.
- Paulus, P. (2000). Groups, teams, and creativity: The creative potential of idea-generating groups. *Applied Psychology*, 49(2), 237-262.
- Paulus, P. B., & Brown, V. R. (2003). Enhancing ideational creativity in groups: Lessons from research on brainstorming. In P. B. Paulus & B. A. Nijstad (Eds.), *Group creativity: Innovation through collaboration* (Kindle Ebook ed., pp. 110-136). New York, NY: Oxford University Press.
- Paulus, P. B., & Coskun, H. (Eds.). (2013). *Creative collaboration, group creativity and team innovation*. New York, NY: Taylor & Francis.
- Paulus, P. B., & Dzindolet, M. (2008). Social influence, creativity and innovation. *Social Influence*, 3(4), 228-247. doi: 10.1080/15534510802341082
- Paulus, P. B., Dzindolet, M., & Kohn, N. W. (2012). Collaborative creativity: Group creativity and team innovation. In D. M. Michael (Ed.), *Handbook of organizational creativity* (pp. 327-357). San Diego, CA: Academic Press.
- Paulus, P. B., & Dzindolet, M. T. (1993). Social influence processes in group brainstorming. *Journal of personality and social psychology*, 64(4), 575.

- Paulus, P. B., Larey, T. S., & Ortega, A. H. (1995). Performance and perceptions of brainstormers in an organizational setting. *Basic and Applied Social Psychology*, 17(1-2), 249-265.
- Pearce, W., B. (2009). *Evolution and transformation: A brief history of CMM and a meditation on what using it does to us*. Draft for book chapter. Pearce and Associates, Inc. Redwood City, CA. Retrieved from www.pearceassociates.com
- Pearce, W., & Pearce, K. (2004). Taking a communication perspective on dialogue. *Dialogue: Theorizing difference in communication studies*, 39-56.
- Pearce, W. B. (1989). *Communication and the Human Condition*. Carbondale, IL: Southern Illinois University Press.
- Pearce, W. B. (1994). *Interpersonal communications: Making social worlds*. New York, NY: Harper Collins College Publications.
- Pearce, W. B. (2006). Doing research from the perspective of the coordinated management of meaning (CMM). 1-20. http://www.pearceassociates.com/essays/research_menu.htm
- Pearce, W. B. (2007). *Making social worlds: A communication perspective*. Malden, MA: Blackwell Publishing.
- Pearce, W. B. (2012). Evolution and transformation: A brief history of CMM and a meditation on what using it does to us. In C. Creede, B. Fisher-Yoshida, & P. Gallegos (Eds.), *The reflective, facilitative, and interpretive practices of the Coordinated Management of Meaning: Making lives, making meaning* (pp. 1-21). Lanham, MD: Fairleigh Dickinson University Press.
- Pearce, W. B., & Carpenter, H. V. (2007). Creating stewards of communication patterns. *OD Practitioner*, 39(1), 5.
- Pearce, W. B., & Cronen, V. E. (1980). *Communication, action, and meaning: The creation of social realities*. New York, NY: Praeger Publishers.
- Pearce, W. B., Cronen, V. E., Johnson, K., Jones, G., & Raymond, R. (1980). The structure of communication rules and the form of conversation: An experimental simulation. *Western Journal of Communication*, 44(1), 20-34.

- Post, C. (2012). Deep-level team composition and innovation: The mediating roles of psychological safety and cooperative learning. *Group & Organization Management*, 37(5), 555-588. doi: doi: 10.1177/1059601112456289
- Post, C., De Lia, E., DiTomaso, N., Tirpak, T. M., & Borwankar, R. (2009). Capitalizing on thought diversity for innovation. *Research-Technology Management*, 52(6), 14-25.
- Putman, V. L., & Paulus, P. B. (2009). Brainstorming, brainstorming rules and decision making. *The Journal of Creative Behavior*, 43(1), 29-40.
- Raboin, W. E. (2010). *The social construction of collaborative practice in a hospital unit*. (Ph.D. 3397542), Fielding Graduate University, United States -- California. Retrieved from <http://search.proquest.com/docview/193961468?accountid=10868> Dissertations & Theses @ Fielding Graduate University; ProQuest Dissertations & Theses (PQDT) database.
- Reiter-Palmon, R., Mumford, M. D., Boes, J. O. C., & Runco, M. A. (1997). Problem construction and creativity: The role of ability, cue consistency, and active processing. *Creativity Research Journal*, 10(1), 9-23.
- Robinson, A. (2010). *Sudden genius? The gradual path to creative breakthroughs*. New York, NY: Oxford University Press.
- Rogers, M. (2009). How do systems work? [powerpoint presentation]. Chicago: Myron Rogers.
- Rouvray, D. (2011). Sudden genius?: The gradual path to creative breakthroughs. *Chemistry & Industry*(13), 27-28.
- Rowe, P. G. (1987). *Design thinking*. Cambridge, MA: MIT Press.
- Runco, M. A. (2008). Commentary: Divergent thinking is not synonymous with creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 2(2), 93-96.
- Runco, M. A., & Sakamoto, S. O. (1999). Experimental studies of creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 62-92). Cambridge, England: Cambridge University Press.

- Ryhammar, L., & Brodin, C. (1999). Creativity research: Historical considerations and main lines of development. *Scandinavian Journal of Educational Research*, 43(3), 259-273.
- Sackmann, S. (1989). The role of metaphors in organization transformation. *Human Relations*, 42(6), pp. 463-485.
- Sacks, H. (Ed.). (1992). *Lectures on conversation. 2 vols.* Oxford, England: Basil Blackwell.
- Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language*, 50(4. Part I), 696-735.
- Salmon, G., & Faris, J. (2006). Multi-agency collaboration, multiple levels of meaning: social constructionism and the CMM model as tools to further our understanding. *Journal of Family Therapy*, 28(3), 272-292. doi: 10.1111/j.1467-6427.2006.00352.x
- Sawyer, K. (2007). *Group genius: The creative power of collaboration.* New York, NY: Basic Books.
- Sawyer, R. K. (1999). Improvised conversations: Music, collaboration, and development. *Psychology of Music*, 27(2), 192-205. doi: 10.1177/0305735699272009
- Sawyer, R. K. (2001). *Creating conversations: Improvisation in everyday discourse.* Cresskill, NJ: Hampton Press.
- Sawyer, R. K. (2003a). Emergence in creativity and development. In R. K. Sawyer, V. John-Steiner, S. Moran, R. J. Sternberg, D. H. Feldman, J. Nakamura, & M. Csikszentmihalyi (Eds.), *Creativity and development* (pp. 12-60). New York, NY: Oxford University Press.
- Sawyer, R. K. (2003b). *Group creativity: Music, theater, collaboration* (First ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Sawyer, R. K. (2003c). *Introduction.* In R. K. Sawyer, V. John-Steiner, S. Moran, R. J. Sternberg, D. H. Feldman, J. Nakamura, & M. Csikszentmihalyi (Eds.), *Creativity and development.* New York, NY: Oxford University Press.

- Sawyer, R. K. (2004a). *Group creativity: Music, theatre, collaboration*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Sawyer, R. K. (2004b). Improvised lessons: Collaborative discussion in the constructivist classroom. *Teaching Education*, 15(2), 189-201. doi: 10.1080/1047621042000213610
- Sawyer, R. K. (2004c). The mechanisms of emergence. *Philosophy of the Social Sciences*, 34(2), 260-282. doi: 10.1177/0048393103262553
- Sawyer, R. K. (2006a). Educating for innovation. *Thinking Skills and Creativity*, 1(1), 41-48.
- Sawyer, R. K. (2006b). *Explaining creativity: The science of human innovation*. New York, NY: Oxford University Press.
- Sawyer, R. K. (2006c). Group creativity: musical performance and collaboration. *Psychology of Music*, 34(2), 148-165. doi: 10.1177/0305735606061850
- Sawyer, R. K. (2007). *Group genius: The creative power of collaboration*. New York, NY: Basic Books.
- Sawyer, R. K., & DeZutter, S. (2009). Distributed creativity: How collective creations emerge from collaboration. *Psychology of Aesthetics, Creativity, and the Arts*, 3(2), 81.
- Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences*, (pp. 97-118). New York, NY: Cambridge University Press.
- Schegloff, E. A., Koshik, I., Jacoby, S., & Olsher, D. (2002). Conversational analysis and applied linguistics. *Annual Review of Applied Linguistics*, 22(1), 3-31.
- Schon, D. A. (1988). Designing: rules, types and worlds. *Design Studies*, 9(3), 181-190.
- Schon, D. A. (1991). *The reflective practitioner: How professionals think in action*. Farnham, England: Basic Books.

- Schrand, T., & Eliason, J. (2012). Feedback practices and signature pedagogies: what can the liberal arts learn from the design critique? *Teaching in Higher Education*, 17(1), 51-62.
- Schutt, R. K. (2008). *Investigating the social world: The process and practice of research*. Newbury Park, CA: Pine Forge Press.
- Searle, R. H. (2004). Creativity and innovation in teams. In D. Miell & K. Littlejohn (Eds.), *Collaborative creativity: Contemporary perspectives* (pp. 175-188). London, England: Free Association Press.
- Seddon, F. (2004). Empathetic Creativity: Product of empathetic attunement. In D. Miell & K. Littlejohn (Eds.), *Collaborative creativity: Contemporary perspectives* (pp. 65-78). London, England: Free Association Books.
- Seddon, F. (2005). Modes of communication during jazz improvisation. *British Journal of Music Education*, 22(1), 47-61. doi: 10.1017/S026505174005984
- Shalley, C. E., & Zhou, J. (2009). Organizational creativity research: A historical review. In J. Zhou & C. E. Shalley (Eds.), *Handbook of organizational creativity* (pp. 3-31). New York, NY: Lawrence Erlbaum & Associates.
- Shotter, J. (1997a). Dialogical realities: The ordinary, the everyday, and other strange new worlds. *Journal for the theory of social behaviour*, 27(2-3), 345-357.
- Shotter, J. (1997b). The social construction of our inner selves. *Journal of Constructivist Psychology*, 10(1), 7-24.
- Simon, H. A. (1996). *The sciences of the artificial* (3rd ed.). Cambridge, MA: Massachusetts Institute of Technology.
- Singh, J., & Fleming, L. (2010). Lone inventors as sources of breakthroughs: Myth or reality? *Management Science*, 56(1), 41-56. doi: 10.1287/orsc.2.1.71
- Smith, C. E. (1994). The Merlin factor: Leadership and strategic intent. *Business Strategy Review*, 5(1), 67-84.

- Smith, S. M., Gerken, D. R., Shah, J. J., & Vargas-Hernandez, N. (2006). Empirical studies of creative cognition in idea generation. In L. Thompson & H.-S. Choi (Eds.), *Creativity and innovation in organizational teams* (pp. 3-20). Mahwah, NJ: Lawrence Erlbaum.
- Sonnenburg, S. (2004). Creativity in communication: A theoretical framework for collaborative product creation. *Creativity and Innovation Management*, *13*(4), 254-262. doi: 10.1111/j.0963-1690.2004.00314.x
- Sonnentag, S., & Volmer, J. (2009). Individual-level predictors of task-related teamwork processes: The role of expertise and self-efficacy in team meetings. *Group & Organization Management*, *34*(1), 37-66.
- Sonnenwald, D. H. (1995). Contested collaboration: A descriptive model of intergroup communication in information system design. *Information Processing & Management*, *31*(6), 859-877. doi: 10.1016/0306-4573(95)00002-x
- Srivastva, S., & Barrett, F. J. (1988). The transforming nature of metaphor in group development. *Human Relations*, *41*(1), 31-64.
- St. John, P. A. (2007). Interactive and emergent processes: Possibilities and problems in group creativity. *Mind, Culture, and Activity*, *14*(4), 290-293. doi: 10.1080/10749030701623847
- Stephens, G. J., Silbert, L. J., & Hasson, U. (2010). Speaker–listener neural coupling underlies successful communication. *Proceedings of the National Academy of Sciences*, *107*(32), 14425-14430.
- Sternberg, R. J. (1999). A propulsion model of types of creative contributions. *Review of General Psychology*, *3*(2), 83.
- Sternberg, R. J. (2005). Creativity or creativities? *International Journal of Human-Computer Studies*, *63*(4), 370-382.
- Sternberg, R. J. (Ed.). (2009). *Handbook of creativity* (12th ed.). New York, NY: Cambridge University Press.

- Sternberg, R. J., & Lubart, T. J. (2009). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 3-15). New York, NY: Cambridge University Press.
- Stokes, P. D. (2009). Using constraints to create novelty: A case study. *Psychology of Aesthetics, Creativity, and the Arts*, 3(3), 174-180. doi: 10.1037/a0014970
- Sutton, R. I., & Hargadon, A. (1996). Brainstorming groups in context: Effectiveness in a product design firm. *Administrative Science Quarterly*, 685-718.
- Trenholm, S., & Jensen, A. D. (2013). *Interpersonal communication* (7th ed.). New York, NY: Oxford University Press.
- van der Heijden, R. A. R. (2011). *The fuzzy front end of radical design-driven innovation*. (Masters of Science Masters), Eindhoven University of Technology, Eindhoven, The Netherlands.
- Verganti, R. (2003). Design as brokering of languages: Innovation strategies in Italian firms. *Design Management Journal (Former Series)*, 14(3), 34-42. doi: 10.1111/j.1948-7169.2003.tb00050.x
- Verganti, R. (2008). Design, meanings, and radical innovation: A metamodel and a research agenda. *Journal of Product Innovation Management*, 25(5), 436-456. doi: 10.1111/j.1540-5885.2008.00313.x
- Wang, J., & Dong, A. (2006). *How am I doing? Computing the language of appraisal in design*. Paper presented at the International Conference on Engineering Design 2007, Paris, France.
- Wasserman, I. C. (2004). *Discursive processes that foster dialogic moments: Transformation in the engagement of social identity group differences in dialogue*. (PhD Dissertation), Fielding Graduate University, Santa Barbara, CA. Available from ProQuest ProQuest Dissertations database. (ATT 3168530)
- Watzlawick, P., Beavin, J. H., & Jackson, D. (2007). Some Tentative Axioms of Communication. In H. L. Muller & R. T. Craig (Eds.), *Theorizing communication: Readings across traditions* (pp. 275-287). Thousand Oaks, CA: Sage.

- Wegerif, R. (2005). Reason and creativity in classroom dialogues. *Language and Education*, 19(3), 223-237.
- Wegerif, R. (2007). *Dialogic education and technology: Expanding the space of learning* (Vol. 7): Springer.
- Weick, K. E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.
- Weick, K. E. (1998a). Improvisation as a mindset for organizational analysis. *Organization Science*, 9(5), 543-555.
- Weick, K. E. (1998b). Introductory essay: Improvisation as a mindset for organizational analysis. *Organization Science*, 9(5), 543-555.
- Weick, K. E. (2004). Designing for Thrownness. In R. J. Boland Jr & F. Collopy (Eds.), *Managing as designing* (pp. 74-78). Stanford, CA: Stanford University Press.
- Weick, K. E., & Roberts, K. H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 357-381.
- West, H. (Writer). (2011). *Innovation made easy* [YouTube Video]. In T. Talks (Producer).
- West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology*, 51(3), 355-387.
- Wheatley, M. J., & Kellner-Rogers, M. (1996). *A simpler way*. San Francisco, CA: Berrett-Koehler Publishers.
- Whissell, C. (2009). Using the *Revised Dictionary of Affect in Language* to quantify the emotional undertones of samples of natural language. *Psychological Reports*, 105, 509-521.
- Winograd, T., & Flores, F. (1987). On understanding computers and cognition: A new foundation for design: A response to the reviews. *Artificial Intelligence*, 31(2), 250-261.

- Wittgenstein, L. (2009). *Philosophical investigations* (G. E. M. Amscombe, P. M. S. Hacker & J. Schulte, Trans.). Chichester, West Sussex, United Kingdom: Wiley-Blackwell, Blackwell Publishing.
- Wolf, J. A. (2011). Constructing rapid transformation: Sustaining high performance and a new view of organization change. *International Journal of Training and Development*, 15(1), 20-38.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*, 293-321.
- Wuchty, S., Jones, B. F., & Uzzi, B. (2007). The increasing dominance of teams in production of knowledge. *Science*, 316(5827), 1036-1039.
- Yin, R. K. (2003). *Case study research: Design and method* (3rd ed.). Thousand Oaks, CA: Sage.

Appendix A

Email Invitation to Participate Creative Collaboration: A Constitutive Accomplishment

Date:
Name:
Email address:

Dear (Name),

You have been asked to participate in a research study conducted by Romi Goldsmith, a doctoral student in the School of Human and Organizational Development at Fielding Graduate University, Santa Barbara, CA. This research involves the study of Creative Collaboration: a Constitutive Accomplishment, which is focused on the Distinctive Greetings Project and is part of Romi's Fielding dissertation and course work. You have been selected for this study because you have previously committed yourself to the Distinctive Greetings Project and have shown a keen interest in collaboration and creativity.

This study involves two phases of research, Phase I and Phase II. Phase I is in March, 2012 until mid-April and Phase II spans mid-April until June 24, 2012. Five total activities are planned, and each involves various people, noted below:

1. The first are videotaped sessions of conversations held between a design class at Levensger University and a workgroup at C4 for the purpose of creating design proposals for Distinctive Greetings. These sessions began in February, 2012 and will be held twice weekly for approximately an hour. Only those two groups will be videotaped through the medium of Adobe Connect. (Students, employees, faculty and C4 Project Manager)
2. The second activity is the response to a weekly, anonymous, reflective questionnaire for the participants in the videotaped sessions, which will take about 15 to 20 minutes at the end of each week. A stamped, self-addressed envelope will be provided by Professor Robinson or Violet Rogers to collect the completed questionnaires for mailing to me. To further safeguard your anonymity, it would help if one student or employee would volunteer weekly to collect and then place in a USPS receptacle. (Students, employees, faculty and C4 Project Manager)
3. The third activity is a telephonic, 45 minute interview about the background of how this project originated, in a one-on-one conversation, arranged for mutual convenience, to happen March 16-19, 2012 for the organizers of the Distinctive Greetings Project. I intend to interview the Chair of the School of Design, the Faculty member facilitating the design class, the C4 Project Manager and the Collaboratory Manager at Distinctive Greetings.
4. The fourth activity is a Group Educational Session for the weekly participants of the Distinctive Greetings Study (students, faculty, employees and Project Manager of

C4), conducted by me in Levenger using the Adobe Connect medium and scheduled in co-ordination with the Faculty and Design Continuum Project Manager for a date the 2nd or 3rd week in May or whatever is most convenient, for the purpose of deconstructing no more than two conversational vignettes to see what kinds of communication patterns may help or hinder creative collaboration. That activity will take approximately two hours.

5. The fifth activity is 90 minute interview for all associated with the Distinctive Greetings Project (students, employees, Faculty, C4 Project Manager, Distinctive Greetings Collaboratory Manager and the Chair of the Department of Design) to inquire into the interpretations and meanings associated with a conversational vignette as well as gain further insight as to what the participants learned over the course of the Distinctive Greetings Project.

As the Faculty and the C4 Project Manager are operationally responsible for participant contact information and logistical elements of Adobe Connect, I ask if you would coordinate those with me as the concerns arise. I do not expect logistical concerns to take more than two hours over the course of this research. The total time that this study requires, per participant classification, per activity, per Phase of the research study is depicted in the chart below:

| Activity | Students and Employees | Faculty and C4 Project Manager | Chair of Design Department and Distinctive Greetings Collaboratory Manager |
|---|--|--|--|
| Phase I: March 1- April 13, 2012 (7 weeks) | | | |
| Weekly questionnaires | 15 -20 min each week Total: ~ 2 hrs for 7 weeks | 15- 20 min each week Total: ~ 2 hrs for 7 weeks | 0 |
| 45 minute interview between March 16-19 | 0 | 45 minute interview | 45 minute interview |
| Logistical co-ordinations (if needed) | 0 | 1 hr | |
| <i>Sub-total for Phase I</i> | <i>~ 2 hrs</i> | <i>~3 ¾ hours</i> | <i>45 min</i> |
| Phase II: April 13 – June 24, 2012 | | | |
| Weekly questionnaires | 15-20 min each week Total: ~1 ½ hrs | 15-20 min each week Total: ~1 ½ hrs | 0 |
| Group Educational Session Deconstructing Conversational Vignettes (held mid-May or later upon discretion of organizers) | 2 hrs | 2 hrs | 0 |
| 90 minute interview between May 14 and June 24 | 90 minutes | 90 minutes | 90 minutes |
| Logistical co-ordinations (if needed) | | 1 hr | |
| <i>Sub-total for Phase II</i> | <i>5 hrs</i> | <i>6 hrs</i> | <i>90 minutes</i> |
| <i>Total time required each participant classification</i> | <i>7 hrs</i> | <i>9 ¾ hrs</i> | <i>2 ¼ hrs</i> |

You are free to consent or decline.

The information you provide in both Phases of this study will be kept strictly confidential. As you know, in your role as one of the organizers of the Distinctive Greetings Project, or as one of the participants, you are known to others because of your participation in the Distinctive Greetings Project over a part or the whole of an eight month period (November 2011-June 2012). In this regard, I cannot promise you anonymity. However, what you say will be held in strict confidence. That is, no one will be able to trace your comments to you.

You will be asked to provide a pseudonym, a name different from your own, for any quotes that might be included in the final research report. You will be asked permission to use any specific quote, and you will also have the opportunity to review a transcript of your interviews and remove any material you do not wish to have used by the researcher.

I ask your permission to access the Adobe Connect digital recording data of all of the sessions and use them for data analysis only. Since all internet communication, even though the most secured, has the possibility of being intercepted I cannot completely promise confidentiality beyond normal password internet usage.

I also ask for your permission to digitally record an interview with you which is also for data analysis that will help me refine any of the research activities currently envisioned for Phase II. The digital recording and all related research materials will be kept in a secure file cabinet and destroyed three years after the completion of the study. The results of this study will be published in Romi's pilot study report, in a paper for the Coordinated Management of Meaning Institute for Social and Personal Evolution as part of Fellowship recognition and later as her dissertation and possibly published in subsequent journals or books.

The information you provide will be kept strictly confidential. This informed consent form and all other materials will be kept separate in locked file cabinets and on a computer with special fingerprint and password access. Only the researcher and possibly a confidential Research Assistant, who has signed the attached Professional Assistance Confidentiality Agreement Appendix I, will listen to the recordings of the conversations from the sessions recorded through Adobe Connect and the digitally recorded interviews. The purpose of the recordings is to capture the actual conversations for data analysis only. The Institutional Review Boards of Fielding Graduate University and Levenson University retains access to all signed informed consent forms.

As a result of your participation in this research, you may gain greater awareness in several dimensions that can be transferred to professional, practical and scholarly domains that would enhance your skill sets, add dimensionality to your career paths, enable you to make contributions to organizational and institutional development, namely: Greater awareness of what enhances communication; greater awareness of the conditions that facilitate and impede a multidisciplinary and multi-sector (e.g., professional services firm, corporate entity, educational institution) collaboration processes; greater awareness of how small group processes intersect with institutional brokering opportunities; more awareness of how to approach and create good design with an open design brief and more awareness and responsibility for how the collaboration process adds to the quality of design outcomes.

Additionally, you could gain insights about how to improve design educational process for professional acuity given that organizations today emphasize learning capacities in leadership development and innovation initiatives and gain possible insights as to how professional practice can better inform educational preparation, thus adding a much called for dimension to scholarly knowledge. Finally, I believe that you could gain increased knowledge of the conditions that facilitate creative breakthroughs so you can replicate them in other venues and situations.

The risks to you are perceived to be minimal; there is a chance that you or others may experience possible damage to your reputation or employability since sometimes in group dialogue or brainstorm experiences, people surprise themselves and others by revealing things they later regret. This could cause discomfort or affect reputation as a team player, or potential employability at C4, due to assessments other group participants make about an individual's creativity or collaborative capacity, or could influence the grade for a student's class work.

It is also possible that a participant may feel discomfort, degraded or self-judgmental upon reflecting upon a creative or collaborative alternative that did not occur to him or her while engaged in the initial conversation. Therefore, it is important that the Reflective questionnaire be used every week as it reiterates that you and others can decline to have a certain interaction removed from my consideration. Should you experience such discomfort, please contact the researcher (Romi) at the phone number listed below. If desired, she will provide a referral list of therapists. In addition, you may withdraw from this study at any time, either during or after the interview, without negative consequences. Should you withdraw, your data will be eliminated from the study, and digital files will be erased and hardcopy thoroughly shredded.

There is no financial reward for participating in this study.

In addition to discussing the preliminary results with the researcher by phone (should you wish to do so), you also may request a copy of the summary of the final results by indicating your interest on the attached form.

If you have any questions about any aspect of this study or your involvement, please tell the researcher before signing this form or at any time during the research process.

This consent form has been sent to you electronically through email. I request that you click your agreement to participate below, or decline below, complete the form, sign it and scan it and return this to me electronically through email at rjbgold@aol.com. Should you want a paper copy of this consent form, please print it out, sign it and retain for your records. Your click and signature indicates that you are over 18 years of age, have read, understood, and agreed to participate in this research. Please keep a copy for your own files and return a copy to me, the researcher: Romi Goldsmith, 4923 Rupert Lane, La Canada-Flintridge, CA, 91011 or at rjbgold@aol.com, my phone number is 818-790-5855.

My faculty advisors for this project are:

- 1) Frank J. Barrett, PhD, Dissertation Chair: Fielding Graduate University, 2112 Santa Barbara Street, Santa Barbara, CA 93105: 805-687-1099 fbarrett@fielding.edu
- 2) Arthur D. Jensen, Senior Associate Dean, Office of Academic Affairs, 205 Crouse College, Syracuse NY 13244-2130: 315-443-5890 adjensen@syr.edu

Consent Page

By clicking here ____ I agree to participate in the research study *Creative Collaboration: A Constitutive Accomplishment*.

By clicking here ____ I decline to participate in the research study *Creative Collaboration: A Constitutive Accomplishment*.

Name of Participant (Please print)

Signature of Participant

Date

Pseudonym (for confidentiality)

Faculty Advisor (s):

- 1) Frank J. Barrett, PhD, Dissertation Chair: Fielding Graduate University, 2112 Santa Barbara Street, Santa Barbara, CA 93105: 805-687-1099 fbarrett@fielding.edu
- 2) Arthur D. Jensen, Senior Associate Dean, Office of Academic Affairs, 205 Crouse College, Syracuse NY 13244-2130: 315-443-5890 adjensen@syr.edu

Request for Summary of the Study:

Yes, please send me a summary of the study results to:

Name of participant (please print)

Street address , City, Zip

Email address

Appendix B

Informed Consent

Creative Collaboration: A Constitutive Accomplishment

My name is Romi Goldsmith, and I am a doctoral student at Fielding Graduate University. I am inviting you to participate in a research study that I am doing under the supervision of Arthur D. Jensen, Levenger Senior Associate Dean, Office of Academic Affairs and Frank J. Barrett, Fielding Graduate University, Chair of my dissertation Committee.

Involvement in the study is voluntary, so you may choose to participate or not. This sheet will give you an overview of the study and if you agree, a more detailed Information Sheet will be provided. Please feel free to ask questions about the research if you have any. I will be happy to explain anything in detail if you wish.

Research Study Focus

The overall purpose of this research is to discover and contribute knowledge about what people actually say and do in the process of creative collaboration. I am looking at what kinds of communication patterns might facilitate creative breakthroughs and creative-collaborative processes and think that this current project between Levenger Department of Design and Design C4 and Distinctive Greetings (the Distinctive Greetings Project) is a special opportunity to do that. By discerning emergent conversational patterns that help and hinder creative collaboration, I think scholars and practitioners could benefit theoretically and practically. This study is a qualitative case study that uses narrative analysis of selected segments of a design workgroup's creation sessions. You have been selected for this study because you have previously committed yourself to the Distinctive Greetings Project and have shown a keen interest in collaboration and creativity.

The whole study has five activities that are spaced out in two Phases: Phase I is in March, 2012 and Phase II is in May and June, 2012. The first Phase includes 45 minute interviews of the Distinctive Greetings Project's organizers, a weekly short (4 item) questionnaire for the students and C4 employees and my analysis of selected video recordings of your work sessions together. The second Phase continues the weekly questionnaire and my analysis of the video recordings and incorporates a Group Educational Session with me for about 3 hours and individual, telephonic interviews for 90 minutes between mid-May and the end of June.

Time Commitment

The overall time commitment that is required for this project varies: for the Distinctive Greetings Manager and the Chair of the Levenger Design Department, the overall time commitment is 2.25 hours, for the students and C4 employees the overall time asked for is 7 hours and for the operational organizers, Ned Robinson and Violet Rogers 9.75 hours is requested, which includes logistical support with participant contact information and perhaps some questions about Adobe Connect.

Protecting Your Confidentiality and Privacy

I ask your permission to access the data recorded through Adobe Connect recordings and use them for data analysis only. I also ask permission to digitally record the telephonic interviews I have with you as well as any sections of the Adobe Connect video sessions that I may elect to study in more detail. Only the researchers (Professor Jensen and me) and possibly a transcriptionist who has also signed a confidentiality agreement will listen to any recordings made of your conversations. Should you want any portion of any session not viewed by me, you can say so and I will not view it. Since all internet communication, even though the most secured, has the possibility of being intercepted I cannot completely promise confidentiality beyond normal password internet usage.

The Institutional Review Boards of Fielding Graduate University and Levenson University retain access to all signed informed consent forms, and they will also be kept in locked files at the student researcher's office.

All information will be kept *confidential*. You will be asked to provide a pseudonym, a name different from your own to which I will assign a code label and comprise a master list, which will be stored in my home combination safe. All electronic files and hard-copy data will be stored in my locked home office and locked files. I alone have the computer passwords and keys to the file locations where the data will be stored and to the home-combination safe. I will dispose of all digital recordings after the research is complete by erasure and deletion of electronic files, and the shredding of any hardcopy data 3 years after the completion of this research study (approximately December 2015).

In the process of compiling my final research report, or articles or presentations I may make, I will use pseudonyms and not reveal details about where you work, live, or go to school. You will be asked permission to use any specific quote, and you will also have the opportunity to review a transcript of your interviews and remove any material you do not wish to have used by me.

As you know, in your role as one of the organizers of the Distinctive Greetings Project, or as one of the participants, you are known to others because of your participation in the Distinctive Greetings Project over a part or the whole of an eight month period (November 2011-June 2012). While we will discourage anyone from sharing this information outside of the group, confidentiality cannot be guaranteed in group situations. In this regard, I cannot promise you anonymity. We will do our best to keep all of your personal information private and confidential but absolute confidentiality cannot be guaranteed.

Possible Risk or Harm

Your study data will be kept as confidential as possible, with the exception of certain information we must report for legal or ethical reasons (child abuse, elder abuse, or intent to hurt yourself or others). As a trained mental health professional, I have a responsibility to report any potential harm to you, or you might make to the appropriate agency about the risk.

Benefits and Risks

The benefit of this research is that you will be helping us to understand the conditions and conversational patterns that facilitate or impede creative breakthroughs and creative collaboration. This information helps efforts to replicate the conversational patterns that facilitate creative collaboration in other fields and situations. Additionally, because of this study, a greater awareness of the conditions that facilitate and impede multi-disciplinary and multi-sector collaboration processes may be used and built upon between commercial enterprise and academies, such as this university or others.

The risks to you of participating in this study are perceived to be minimal. Sometimes in group dialogue or brainstorm experiences, people surprise themselves and others by revealing things they later regret. This could cause discomfort or possibly affect your reputation as a team player. These are remote risks, as class evaluation will likely be completed before the research project is over. If you do feel repeated or disturbing discomfort, please contact me (Romi) or the faculty supervisors at the phone numbers listed below, and if desired we will provide you a referral list of mental health professionals you can contact.

If you do not want to take part, you have the right to refuse to take part or withdraw from the study at any time, without penalty. Should you withdraw, your data will be eliminated from the study, and digital files will be erased and hardcopy thoroughly shredded.

Contact Information:

If you have any questions, concerns, complaints about the research, contact the doctoral student researcher, Romi Goldsmith at 818-790-5855 or at rjbgold@aol.com, or Arthur Jensen at 315-443-5890 or at adjensen@syr.edu or Frank J. Barrett at fbarrett@fielding.edu or through the Fielding IRB office at 800-340-1099 x 4033.

If you have any questions about your rights as a research participant, or you have questions, concerns, or complaints that you wish to address to someone other than the investigators listed above, or if you cannot reach the investigators, contact the Levenger University Institutional Review Board at 315-443-3013 or the Fielding University Institutional Review Board at 800-340-1099 x 4033.

There is no financial reward for participating in this study.

In addition to discussing the preliminary results with the researcher by phone (should you wish to do so), you also may request a copy of the summary of the final results by indicating your interest on the attached form.

This consent form has been sent to you electronically through email. I request that you click your agreement to participate below, or decline below, including the appropriate permissions for video and audio recording. Please complete the "Granting Consent" form below and the Acknowledgement Receipt of Informed Consent and return them to me electronically through email at rjbgold@aol.com, and keep a copy for yourself within your electronic medium as well as a printed copy for your records.

Granting Consent

All of my questions have been answered, I am 18 years of age or older, and I wish to participate in this research study. I have received a copy of this consent form and have printed a copy for my records.

The pseudonym I would like used for this study is: _____

Specific Permissions for Media:

Video:

___ I agree to be video recorded through Adobe Connect and have the recordings available to the researcher.

___ I do not agree to be video recorded through Adobe Connect and have the recordings available to the researcher.

Audio:

___ I agree to be audio recorded

___ I do not agree to be audio recorded

By clicking here (and returning this “Granted Consent” portion of this informed consent) I agree to participate in this research study.

Printed name of participant

Date

Signature of researcher

Date

Printed name of researcher

Request for Summary of the Study:

Yes, please send me a summary of the study results to:

Name of participant (please print)

Street address, City, Zip

Appendix C

Research Staff Confidentiality Agreement

Professional Assistance Confidentiality Agreement

Title of Dissertation: Creative Collaboration: A Constitutive Accomplishment

Student Researcher: Romi Goldsmith, MFT, MHOS, ACC

Supervising Faculty: Arthur D. Jensen, Levenger University
205 Crouse College
Syracuse, NY 13244-2130

I have agreed to assist Romi Goldsmith in her research study called Creative Collaboration: A Constitutive Accomplishment in the role of transcriber/transcription service or as a research assistant (Circle one).

I understand that all participants in this study have been assured that their responses will be kept confidential. I agree to maintain confidentiality.

I further agree that no materials will remain in my possession beyond the operation of this research project and I further agree that I will make no independent use of any of the research materials from this project.

Signature: _____

Printed Name: _____

Company Affiliation: _____

Address _____

Title: _____

Date: _____

Researcher Signature: _____

Date: _____

Appendix D

A Reflective Questionnaire

Purpose: This reflective questionnaire helps me identify what you see as the most important moments during your collaborations with each other so that I can examine those moments in greater detail.

Instructions: Please take no more than 15 minutes to think about your experience that involves the group's interaction this week where you felt something important was happening that either moved the group toward greater creativity and collaboration or away from it.

Please do not put your name on this, and you may choose not to fill this out at all without negative consequences. Turn them into a self-selected participant who will then seal them in a stamped envelope and mail them to me at 4923 Rupert Lane, La Canada-Flintridge, CA, 91011. Stamped envelopes are available from Professor Robinson or Violet Rogers.

1. What were some interactions or moments that happened this week that looked promising for your creativity as a group?
2. Were there notable instances when you might have felt frustrated or perceiving that there was some obstacle for the group?
3. Do you have any examples of times over the week that you felt you made progress?
4. Did anything happen that made you feel confused or unclear about how things were going to turn out?

REMINDER: If any interaction occurred this week that you do not want me to view, please let me know at rjbgold@aol.com and I will remove it from my research data.

Appendix E

Interview Protocol – Organizers of the Distinctive Greetings Project

(Distinctive Greetings Collaboratory Manager, C4 Project Manager, Levenger Faculty Member, Levenger Department of Design Dean)

I introduce myself and the purposes of the interview. I tell the respondents that I am grateful for their time and will be recording the interview as part of my data gathering activity for my research and remind them at any time they can ask me to stop the recording should they feel concerned, distressed or anxious. I also re-iterate my name, phone number and email address so they can contact me should they have any additional thoughts or concerns to address.

Purposes of Interview: Learn about the background and reasons for the Distinctive Greetings Project

1. Establish relationship and inquire into their context for the Distinctive Greetings Project: Aims, challenges/breakdowns/concerns that will make a difference to creativity and collaboration.
2. Learn what contextual elements are shaping the project
3. Share an example of what I am going to look at and the perspective I take

Questions:

Background questions on the individual to establish the social and professional frame:

1. Name and organizational affiliation?
2. What is your professional title and experience? How do you like to be known professionally?
3. What motivates you in the fields of design/collaborations?

About conditions leading up to the Distinctive Greetings Project

4. Could you share with me some of your thoughts on what prompted you to initiate or endorse and support this project?
5. What are your aims for the Distinctive Greetings Project?
6. Anything that concerns you about it?
7. What does the Distinctive Greetings Project enable for your organization?
8. What do you think the project will do for the participants in the project?

Share a dialogue vignette as an example of what I am looking at: I will share a small, sample vignette excerpt from the recorded interaction (about 6 lines of dialogue, no more), and I will ask this one question:

9. What do you think was happening in this interaction?
10. Anything else you'd like to say before we conclude?

Express appreciation for their time, interest and support for this research. Verify when I will speak with each again.

Appendix F

Group Educational Session – The Distinctive Greeting Project Active Participants

Purpose: Test out the “conversational map” (CMM) idea and conditions for creative breakthroughs in a collaborative workgroup

Setting the Context:

- *Interactive process – no right or wrong answers, or place to ‘get to’*
- *Listen to what you share about your experience of each mapped interaction about creative moments*

A Communication Perspective Approach: Part of the conditions that set up what can happen in workgroups are what and how we talk and interact with each other. I am interested in looking at that and invite you to also so we have more clarity into what we are making and how we are making it.

I am going to share a two short vignettes that highlight creative moments -- “helpful or hindering” that I have located in the videotape from the reflective questionnaires that the you have turned in.

Each vignette will be presented in a conversational ‘map’ – a drawing of the conversational flow of an identified critical creative moment – like a snake pattern of what was said in the dialogue.

I will invite you to comment on this process of reviewing the conversational vignette itself. Any insights, positive or negative, are useful data for this research, there is no right or wrong answer, and if you become stressed by this in any way we can stop.

Presentation of the “Helpful” Vignette first, then themes from the “Hindering/Troubling” parts of the questionnaire: A majority of the questionnaires reflected that the following feedback was helpful/troubling for creativity (or collaborative) emergence during the week of (name the timeframe) --person’s names will be by pseudonym they chose or by alphabetical code to indicate different persons who spoke:

Group Inquiry for “Helpful Vignette: In our discussion of each vignette I encourage you to tell me the story around that you see here...”(Main questions numbered...lettered questions are prompts, and not all will be asked).

7. In “seeing” how this interchange is laid out now, what moments seemed most lively or promising?
 - a. At any time during this interaction, did you learn something that you think helped you become more connected to each other?
 - b. At any point in this vignette was someone voicing the “group’s” wisdom/creativity?

- c. Did anything happen that helped you consider something new, (or span a boundary)?
8. Did anything happen before those that seemed influential?
9. Any frustrating, unclear or confusing points that you can see?
 - a. What seemed most important for Person X at that time? For you?/Others?
 - b. Are there any points at which you would like to “do over”?
 - c. Any times when you weren’t happy about the direction of things, and then it turned out ok?
10. Did anything from this interchange have “a life of its’ own” for the group? Tell me about that...
11. Are these patterns of interaction similar or not to the ones you’re used to? How?
12. Anything you want to say about how seeing the conversational map and the meanings we have about it?

Group Inquiry for “Hindering” Themes: *In reading the questionnaires for week ____, what was hindering may seem to revolve around presenting ideas and critiquing ideas as part of the design process. I will depict a generic form of what was gleaned from the questionnaires in these categories, with identifiers removed and re-iterate that while it might be easy to think the comments from the ‘critiquing presentations’ would come only from the C4 group, in fact, the comments that could be listed could also come from the Levenger Student Group as well.*

| <i>Presenting Ideas</i> | <i>Critiquing Ideas</i> |
|-------------------------|-------------------------|
| <i>Comment 1</i> | <i>Comment 1</i> |
| <i>Comment 2</i> | <i>Comment 2</i> |

The following are my prompting questions for dialogue:

1. In “seeing” these comments and how people may have felt about feedback, any moments seem lively or promising?
 - a. Anything that helped you become more connected to each other?
 - b. Anyone voicing the “group’s” wisdom/creativity?
 - c. Anything happen that helped you consider something new, (or span a boundary)?
2. Any times you weren’t happy about the direction of things, and then it turned out ok?
3. *(Use a comment and ask them to silently think of an incidence of this in their experience)*What seemed most important for Person X at that time? For you?/Others?
4. Are there any points at which you would like to “do over”?
5. Did anything from challenging or being challenged and/or awkward silences have “an afterlife” for you? Tell me about that...
6. Is there anything you can think of now that you could have done or asked for about any one of these comments that could have helped you?
7. Are these patterns of interaction similar or not to the ones you’re used to? How?

Thank them for their time, invite questions or more communication to me at my email or phone. Give people a chance to schedule their individual telephone interview with me there, or by email and remind them that interviews will be happening between after this until June 24, 2012.

Appendix G

Final Interview Protocol—What Was Learned

Learning and Reflecting

This interview begins with several points:

- a) Verification that the participant has adequate time for the interview
- b) Reminder that I am recording the session and they have an opportunity to ask questions before we get started and to ask me to turn off the recorder at any point
- c) An short overview of the agenda for the interview

Agenda for Interview

- a) Review of the Group Conversational Map Session
- b) Review of meaning made from a piece of dialogue interaction taken from recorded data in which you were involved
- c) Reflection on the whole of The Distinctive Greetings Project

Review of the Group Conversational Map Session *(For only the participants who were in this session prior; students, faculty, employees and Project Manager of C4)*

6. Since our Group Education Session, any insights about conversations and the process of creative collaboration? *(Note: This interview is at the end of the Distinctive Greetings Project so the respondent's frame of reference will be the recent past).*
7. In thinking about the map and the interpretations we uncovered, is there anything about that experience that verifies anything you already believed, contradicts something, or changes your mind?
8. What about this process was most significant to you? What, if anything, do you see yourself doing with this experience from here forward?
9. As a result of our conversations, through the weekly questionnaires, and the Group Education Session, did you experience any changes besides what you have already shared with me?
 - d. How do you consider those changes? Positive, negative, neutral?
 - e. Any change that was significant for you?
 - f. What contributed to that significant change?
10. Do you have any other feedback about this process? Your observations, positive and negative, are extremely valuable to this research and to me.

Review of Dialogue Interaction From Recorded Data *(In viewing the recorded data, some interactions indicate there was more than just the surface give and take of what people were saying. I would like to inquire further into what was intended in an interaction by asking the participants. I would locate those 1 or 2 interactions, send them a written reference to the recorded data which they can access, and a partial transcript of what I am reviewing by*

email prior to the interview to refresh their memory.) I would ask the following open-ended questions:

14. In recalling this interaction, describe what you think was really going on?
15. When you said _____, what did you mean?
16. When ___ happened in the conversation, was there anything you felt you couldn't say but wanted to?
17. When that moment in the interaction occurred, what seemed the most important to you? And what would you speculate was the most important to the other people involved?
18. What thoughts (associations, prompted you to say (or do) this next thing?
19. What feedback was the most helpful in your accomplishing what you wanted with your design?

Reflection on the Distinctive Greetings Project

20. What about this process of the Distinctive Greetings Project was most significant to you?
21. What did you learn over the course of the Project?
 1. Did this experience verify anything you already believed, contradict something, or change your mind?
22. Is there anything that you wish was done differently?
23. Any major disappointments or things you think were failures that didn't get learned from (yet)?
24. What were the best examples of creative moments overall?
25. What comes to mind when I say, "moments where you all turned a train-wreck into high-speed rail"?
26. What successes do you see from this Project?

To Conclude Interview and Experience of Participating in this Research:

I will thank the respondents for their time, an irreplaceable resource, their efforts and their good will. I will send each a hand-written note of thanks. I will remind them of my email and phone should they have any concerns to address or further thoughts.

Appendix M1a

CMM Simple Conversational Map (Serpentine, Hierarchy of Contexts) of Bailey Interaction

Legend:**Shapes & Borders**

Rectangle – Bailey speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/boarders – actions or unspoken communication

Symbols

+ - said directly

^ - inferred

Episode: Relieve the pressure of this project. +: Get it wrapped up. ^

Speech Acts: Get C4's answer/help on the middle part of the presentation. +

Task: Figure out how I'm going to do this project's presentation. ^

URNS 1-3: TRYING TO PRESENT A RANDOM ACTS OF GENEROSITY PROJECT

#1. B: Project still in sketch format... Four little ideas... Step up on level of engagement & involvement... "Share & tear..."

#1. B: 2 separate ideas... Reinvent the business card...

#1. B: Story book of matches... More than giving sticker... Not sure which one is better...

#3. B: Ok. Give party package, what prompted "acts of kindness" & goal.

#2. T: Think about what's tying these together.

URNS 4-8: TRYING TO TUNE IN

#5. B: Don't remember what's written down specifically, to spread generosity, connect strangers.

SILENCE

#6. B: Wait, so you mean...

#7. B: Yeah

#8. B: Not whole new idea, but latch onto something... Become part of something that already exists... Go back to how I was going to present it...

#8. B: Various levels of involvement... Purple star...

#4. V: Could? you say your goal

#6. T: Need to push these ideas further.

#7. R: You walk out of Starbucks & there's a homeless guy, odd reaction.

Episode: Don't let this go in circles like it has been for weeks. ^

experiments. ^

Professional Development: Make sure that there's a core of an idea in here somewhere. ^
Relationship: Admiration for Bailey & her developmental success re using her failure in warehouse

Episode: Relieve the pressure of this project. +: Get it wrapped up. ^

Speech Acts: Get C4's answer/help on the middle part of the presentation. +

Task: Figure out how I'm going to do this project's presentation. ^

URNS 9-13: TWO RADIOS TALKING ON THIS PROJECT

#9. B: Ummm.

#9. V: I'm not really getting it.

#10. V: What is it?

#11. B: Man takes picture & keeps it, about system & how it's shared.

#12. V: Is it an art project?

#12. T: Who's paying for it?

#12. V: Is it a campaign?

#13. B: Yeah, similar to Red Campaign... Like Willy Wonka w/four levels...

Episode: Don't let this go in circles like it has been for weeks. ^

Relationship: Admiration for Bailey & her developmental success re using her failure in warehouse experiments. ^

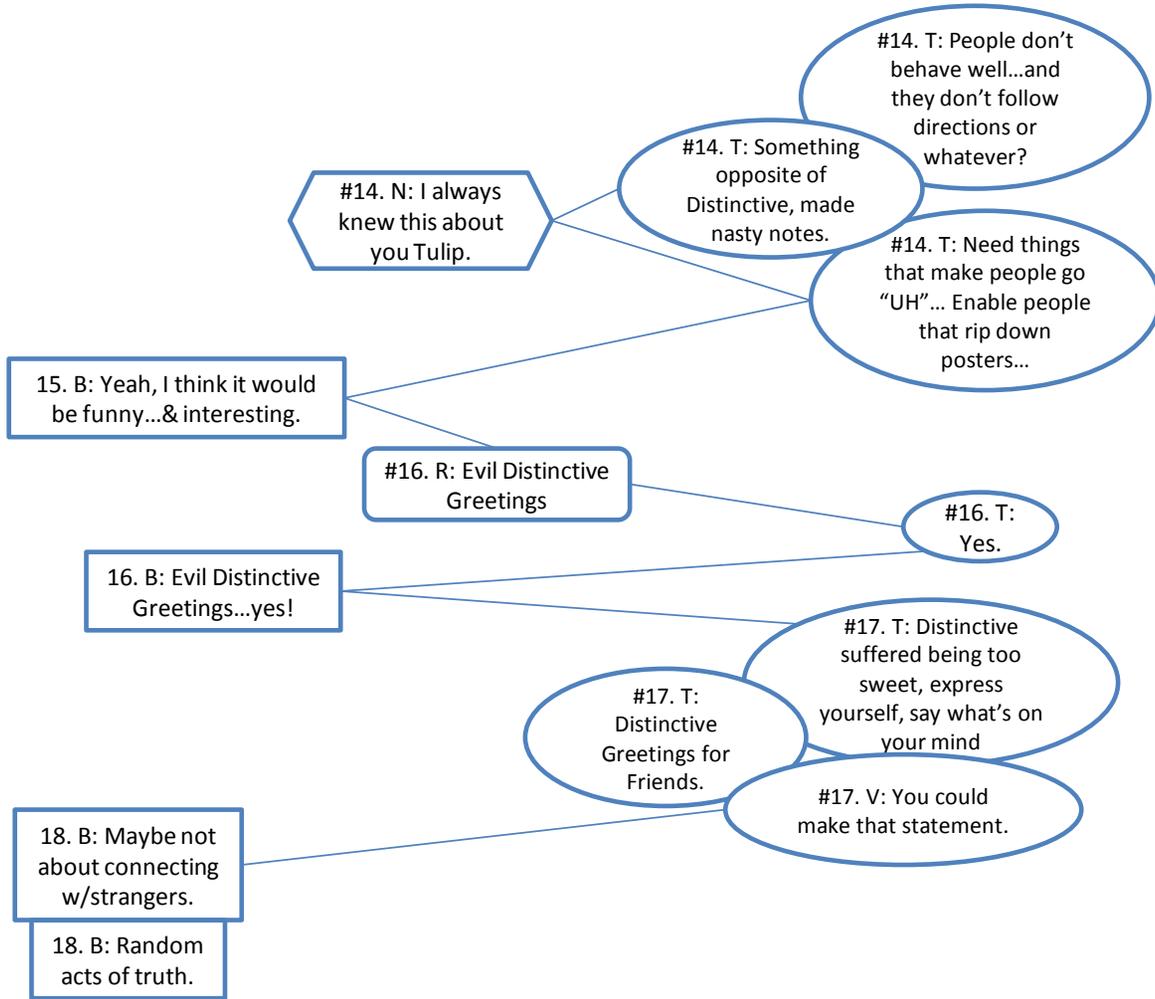
Professional Development: Make sure that there's a core of an idea in here somewhere. ^

Professional Development: I can push my clients' boundaries.

Identity: Ok to break the rule, than follow it.

Relationship: Collaborate when you're stuck.

URNS 14-18: TUNE IN TO ANOTHER POSSIBLE PROJECT – OPPOSITE OF DISTINCTIVE GREETINGS: RANDOM ACTS OF TRUTH



Group: Validate potential contribution of students to Distinctive Greetings.
Professional Development: Go further than client's customary story.

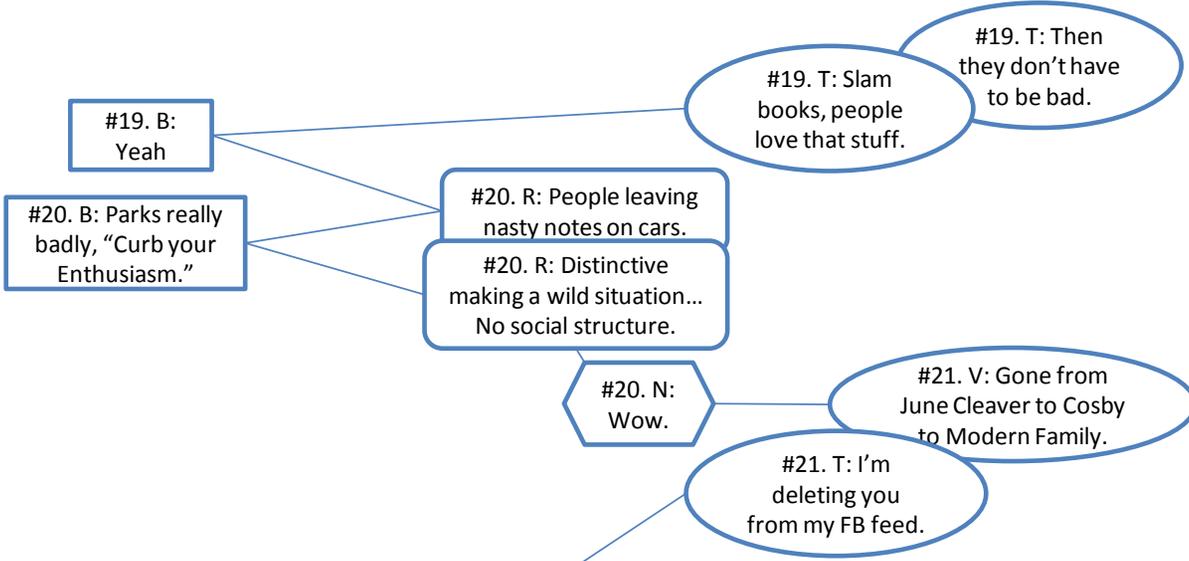
Relationship: (Join with Bailey) BUILD FROM HER UNIQUENESS.

Professional Development: I can push my client's boundaries.

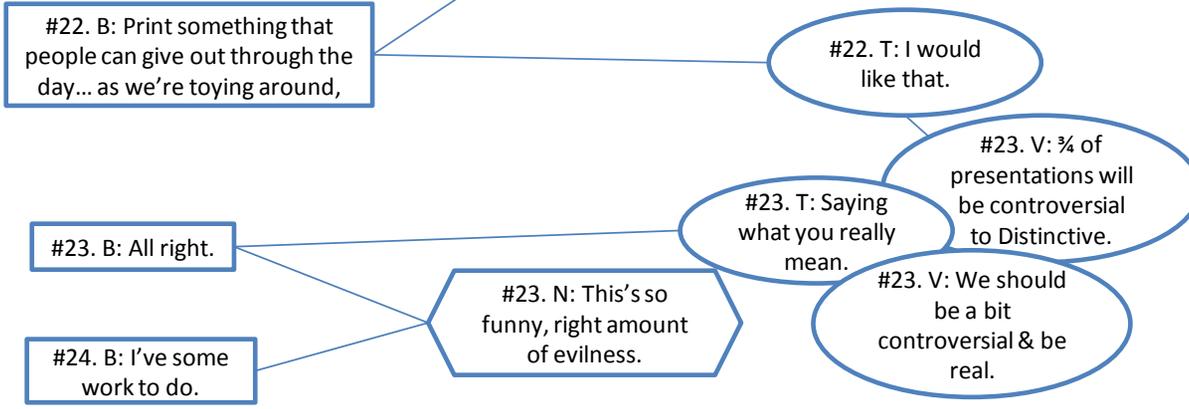
Identity: Ok to break the rule, than follow it.

Relationship: Collaborate when you're stuck.

URNS 19-21: BUILDS FOR BEING TRUTHFUL IN BAD SITUATIONS



URNS 22-24: BUILDS FOR BEING TRUTHFUL IN BAD SITUATIONS – HOW IT COULD PLAY WITH DISTINCTIVE GREETINGS



Group: Validate potential contribution of students to Distinctive Greetings.

Professional Development: Go further than client's story.

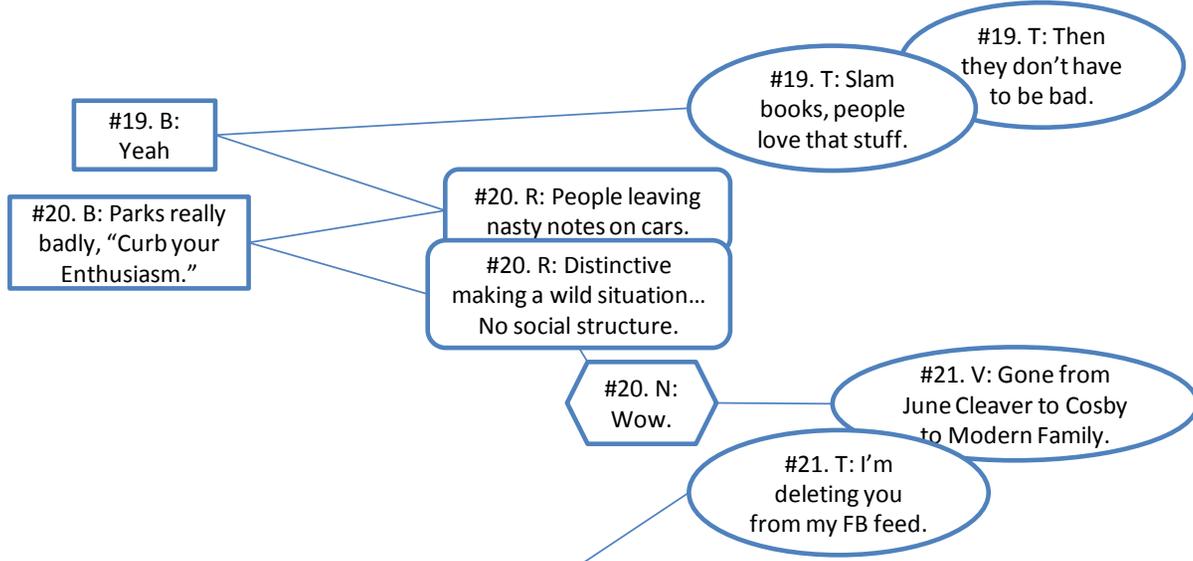
Relationship: (Join with Bailey) BUILD FROM HER UNIQUENESS.

Professional Development: I can push my client's boundaries.

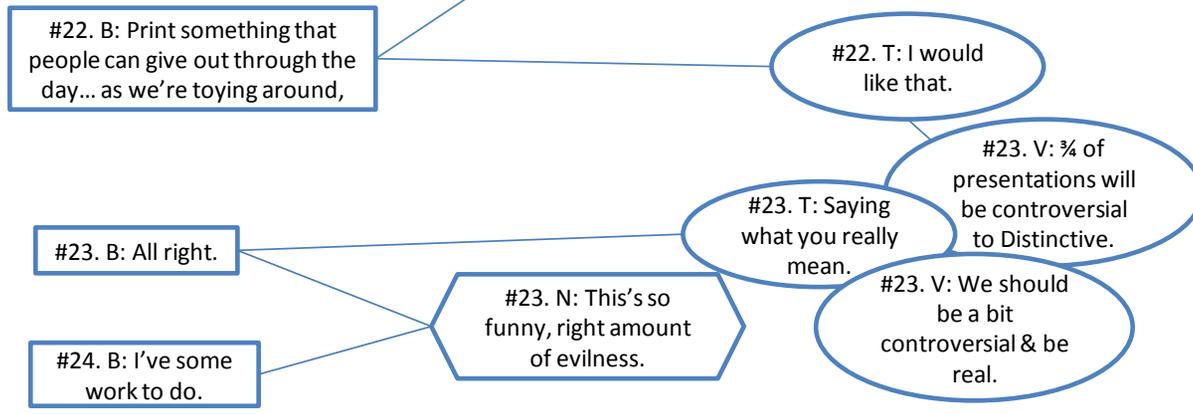
Identity: Ok to break the rule, than follow it.

Relationship: Collaborate when you're stuck.

URNS 19-21: BUILDS FOR BEING TRUTHFUL IN BAD SITUATIONS



URNS 22-24: BUILDS FOR BEING TRUTHFUL IN BAD SITUATIONS – HOW IT COULD PLAY WITH DISTINCTIVE GREETINGS



Group: Validate potential contribution of students to Distinctive Greetings.

Professional Development: Go further than client's story.

Relationship: (Join with Bailey) BUILD FROM HER UNIQUENESS.

Professional Development: I can push my client's boundaries.

Identity: Ok to break the rule, than follow it.

Relationship: Collaborate when you're stuck.

URNS 25-29: MORE RESOURCES OFFERED

#29. B:
Yeah

- #25. T: In person stuff can still work.
- #26. T: Negative stuff off mind you can actually build a relationship.
- #27. T: "10 Habits of Annoying Coworkers."
- #28. T: "Somecards."

URNS 30-32: ACKNOWLEDGEMENT

#31. B: TRYING TO TALK

#32. B: Yeah, thanks.

- #30. V: I'm attracted to simpler solutions rather than the camera, printer or USB...
- #31. T: TRYING TO TALK

Group: Validate potential contribution of students to Distinctive Greetings.

Professional Development: Go further than client's story.

Relationship: (Join with Bailey) BUILD FROM HER UNIQUENESS.

Appendix M1b

CMM Simple Conversational Map (Serpentine, Hierarchy of Contexts) of Dora Interaction

Legend:**Shapes & Borders**

Rectangle – Dora speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/borders – actions or unspoken communication

Symbols

+ - said directly

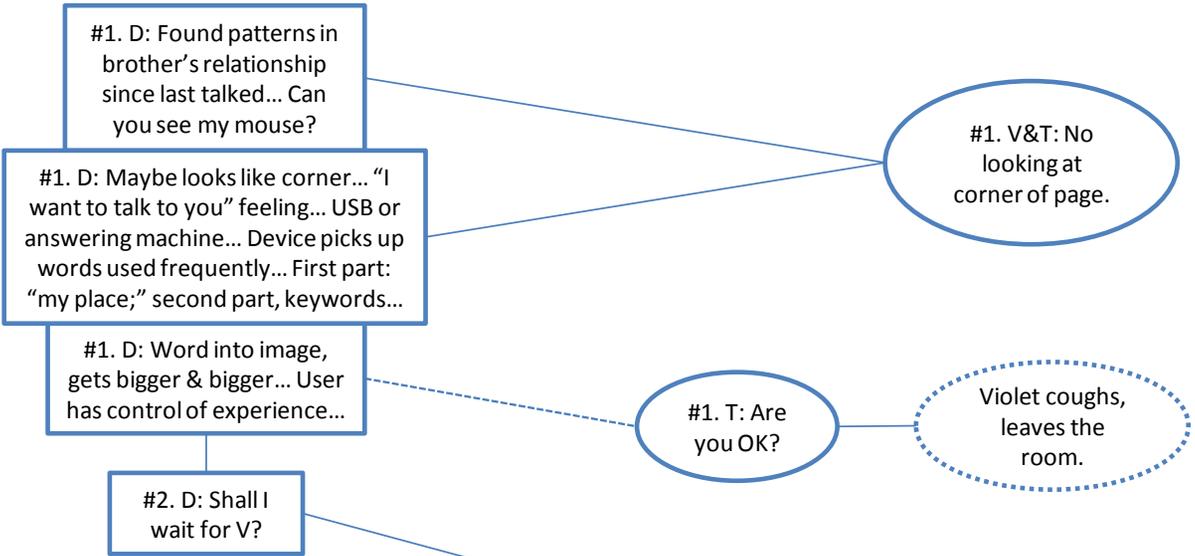
^ - inferred

Speech Act: Get across my idea & be able to tell what they think of it. +

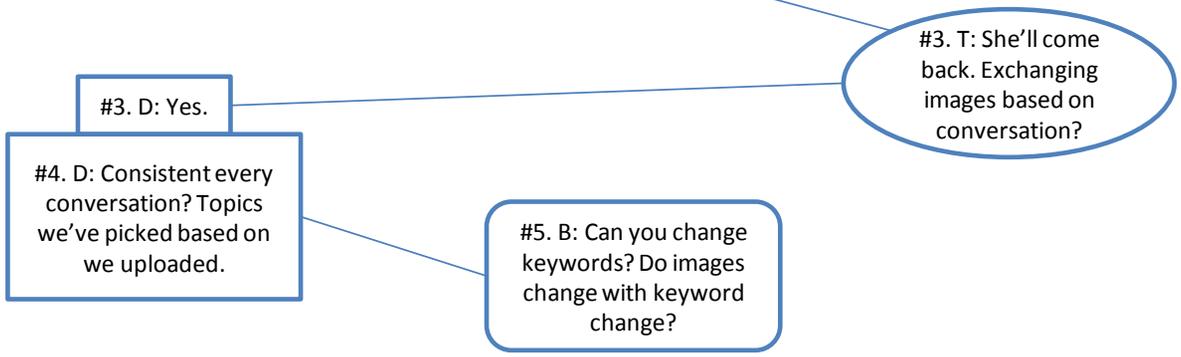
Identity: Let me do well in this interaction with C4 & not embarrass myself. +

Professional Development: Improve my design with their feedback. +

TURN 1-2: PRESENTING JUMBLE + INTERRUPTION



URNS 3-5: ATTEMPTS TO CLARIFY



Professional Development 2: Talk about main idea separately from how you design system. v

Professional Development 1: Gear & focus of design story rests on what matters in customer’s experience. +

Episode: Find way to connect & correct appropriately with TODAY’s interaction. v

Speech Act: Get across my idea & be able to tell what they think of it. +

Identity: Let me do well in this interaction with C4 & not embarrass myself. +

Relationship: Make sure I am communicating so they can understand it. ^

with their feedback. +

TURN 6-8: SOMETHING NOT WORKING FEEDBACK

#6. D: Yes. You can add more. Graphic image pops up.
#6. D: Is that clear?

#8. D: Ok, maybe better represented by storyboard. Perspective?

#7. T: I'm having a tough time understanding. PAUSE.
#7. T: V do you see?

Tulip looks at Violet.

URNS 9-11: ACKNOWLEDGE CRIT, METAPHOR (COLLABORATING TO BRIDGE)

Dora witnesses conversation

#10. N: INAUDIBLE
#10. N: What--

#9. T: Your drawings are really nice. Embrace experience of consumer.

#10. V: I--

#10. V: Go ahead.

Ned & Violet try to speak at same time.

#11. V: Maybe I've missed a lot...Help me understand. Important for people to talk about tangible things?

Professional Development 2: Talk about main idea separately from how you design system. ^

Professional Development 1: Gear & focus of design story rests on what matters in customer's experience. +

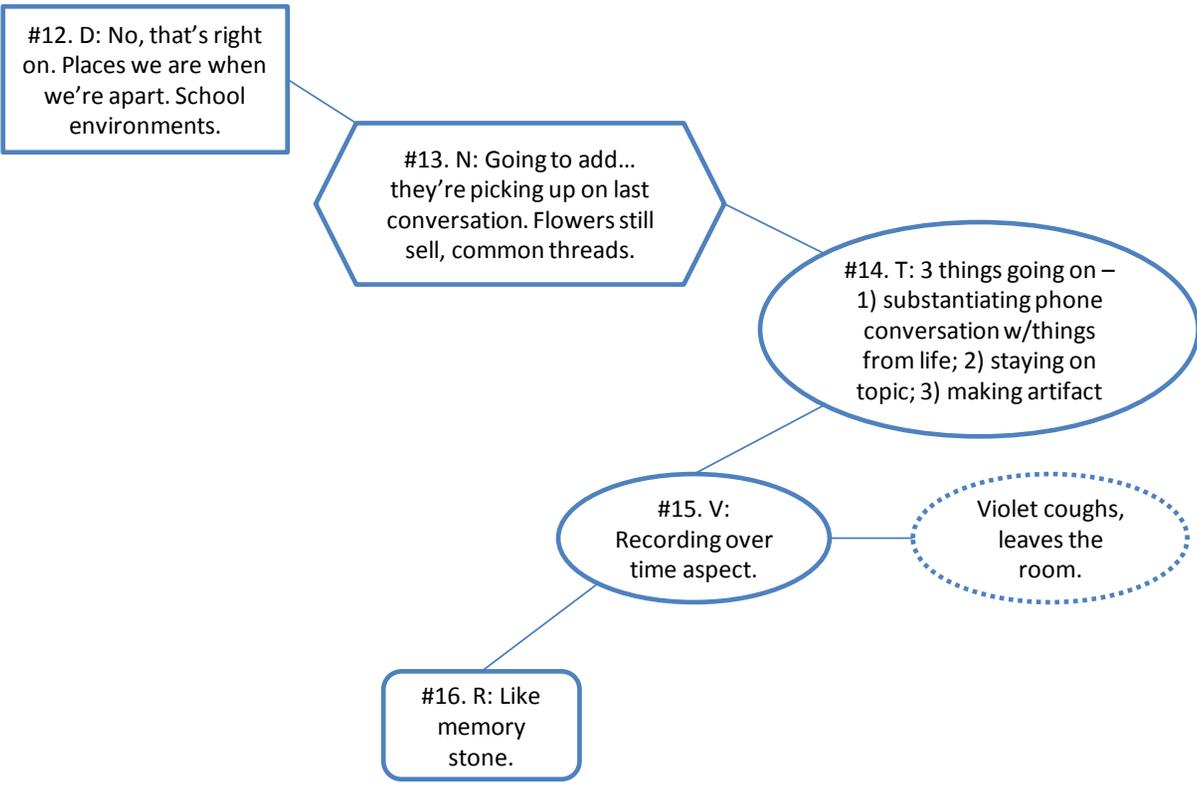
Episode: Find way to connect & correct appropriately with TODAY's interaction. ^

Relationship: They heard me & understand it. +

Professional Development: Improve my design with their feedback. +

Episode: Now make sure it is clean for Distinctive Greetings in a few weeks. +

TURN 12-16: ACCEPT, ADD, SUMMARIZE, BUILD (OPENING FOR NEW ACTION & MEANING)



Professional Development 2: Talk about main idea separately from how you design system. ^

Professional Development 1: Gear & focus of design story rests on what matters in customer's experience. +

Episode: Find way to connect & correct appropriately with TODAY's interaction. ^

Appendix M1c

CMM Simple Conversational Map (Serpentine, Hierarchy of Contexts) of Samantha Interaction

Legend:**Shapes & Borders**

Rectangle – Samantha speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/borders – actions or unspoken communication

Symbols

+ - said directly

^ - inferred

Episode: Present the best I can so they understand it; I know it's disjointed. +

Relationship: Show that I heard them from the last time on infographics and creating story. ^

Speech Act: I'm worried about getting a chance to ask about the wristband. ^

TURN 1: PRESENTS PROJECT; PRESENTS KAREN

#1. S: Failure of communication in medical field... Idea of environments for communication that tracks medical history in a visual comparative... Dr. would like to be more rosy... Capture medical snapshot to create story about yourself...

#1. S: Karen at Dr.'s for 10 min, review profile, breakfast food spikes numbers... Didn't realize... Changed her behaviors without knowing it...

#1. S: Karen is 45, diabetic, family history of heart disease, glucose is 267.

Tulip, Wendy & Violet listening.

URNS 2-5: JOINING WITH SAMANTHA IN HOW TO TELL A LIFE CHANGING STORY (FROM MEDICAL IMPLICATIONS)

#3. T: Like a light bulb

#4. V: Yeah

#2. V: Intro earlier with her life (toast) to set up realization.

#5. W: Like you're connecting Karen to more of her life & app usages.

Relationship: Build alignment in C4 on feedback to Samantha. +

Speech Act: Give Samantha direct feedback that she can build on; analogies & examples are helpful in talking about high level concepts. +

Episode: Build on the progress Samantha has shown. ^

Episode: Present the best I can so they understand it; I know it's disjointed. +

Relationship: Show that I heard them from the last time on infographics and creating story. ^

Speech Act: I'm worried about getting a chance to ask about the wristband. ^

URNS 6-8: ADDITIONAL PRACTICAL APPLICATIONS

#6. S: Okay.

#8. S: Okay.

#7. V: Research on pumps self-adjusting insulin for you

TURN 9-12: ADDITIONAL PRACTICAL APPLICATIONS OF DESIGN SUGGESTED BY ANALOGY

#12. S: Okay!

#9. W: Yeah, the other one is food allergies analogy.
#10. W: Coworker allergic to gluten story.
#11. T: It's like a helper-on-food-calibration so you can learn.

Relationship: Build alignment in C4 on feedback to Samantha. +
Speech Act: Give Samantha direct feedback that she can build on; analogies & examples are helpful in talking about high level concepts. +

Episode: Build on the progress Samantha has shown. ^

Episode: My design needs to work for Distinctive's customers. ^

Identity: This is at least the right realm. +

Professional Development: Relate this to the audience. ^

URNS 13-16: STORY CONFLATION

#13. N: Wriststrap or transdermal patch. Reminder consciousness or communication with devices?

#15. W: The gear was cool.

#14. T: Wristband backseat, app reaching out to her device, 1st story like ultra-fit cross trainer.

#16. V: Flood of wristbands on market, capture & display.

Professional Development: My design needs to work for Distinctive's customers. ^

Speech Act: Get my scenarios straight. +

Episode: How would avatars work in? ^

TURN 17-18: HANDLING TRENDS

#17. N: Capture & display isn't showing yet...next action.

#18. B: Vegan, gluten-free trend.

Relationship: Make sure this conversation forwards Samantha. ^

Speech Act: Be able to say what your product will DO for people. +

Professional Development: Focus on why this whole thing is important. ^

Professional Development: My design needs to work for Distinctive's customers. ^

Speech Act: Get my scenarios straight. +

Episode: How would avatars work in? ^

URNS 19-21: BEHAVIORAL ASSESSMENTS & PRODUCT CONSTRAINTS

- #19. V: In real product presentation make decision: medical or consumer (FDA Rules).
- #20. T: Recent article re people's poor judgment on their behaviors & "trackers" gap for new knowledge.
- #21. V: "Burn calories" + "calories listed" = trouble.

Episode: Changed my design's focus & design problem. ^

Relationship: I understand & am recapping to show you that I took it in. +

Identity: Am I, is this good? +

TURN 22-27: RETURN TO CREATIVE COLLABORATION

#22. S: Very helpful, more focused on design scenarios straight, my graphics more personable. Avatars? Sliders? Flower to show how feeling.

- #23. B: Funny if you could choose what you wanted to be.
- #23. R: Like a bear.
- #23. B: Out killing fish.
- #27. R: Work with different kinds of users, I'm #s other like perky/wilted.

Tulip, Wendy & Violet laughing.

- #24. T: Like it that you could pick & prompts to put you in positive place
- #25. V: #s available, but see flower
- #26. T: Things in your life, like white bread or go running.

Relationship: Make sure this conversation forwards Samantha. ^

Speech Act: Be able to say what your product will DO for people. +

Professional Development: Focus on why this whole thing is important. ^

Episode: Changed my design's focus & design problem. ^

Relationship: I understand & am recapping to show you that I took it in. +

Identity: Am I, is this good? +

TURNS 38-31: ARTICULATION OF SAMANTHA'S CORE OFFER

#28. S: That's about it, tying Distinctive with this, scenarios are creating such a story, brining emotional side.

#31. S: Great, helping people be their best.

#30. T: Less data driven, add scenario people generally-moods & maintaining best mood.

TURNS 32-33

#32. N: Scotland they say the same, East Coast they tell you! How much can you share with people?

#33. V: Interesting data backup from FB/social media to see how much they talk about mood (a lot).

Relationship: Make sure this conversation forwards Samantha. ^

Speech Act: Be able to say what your product will DO for people. +

Professional Development: Focus on why this whole thing is important. ^

Appendix M2a

CMM Complex Conversational Map (The simple maps with the additional analysis of Bifurcation Points, Logical Force, Creative Breakthrough Moments) of Bailey Interaction

Legend:**Shapes & Borders**

Rectangle – Bailey speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/borders – actions or unspoken communication

Colors

Pink – figurative language

Orange – creative breakthrough

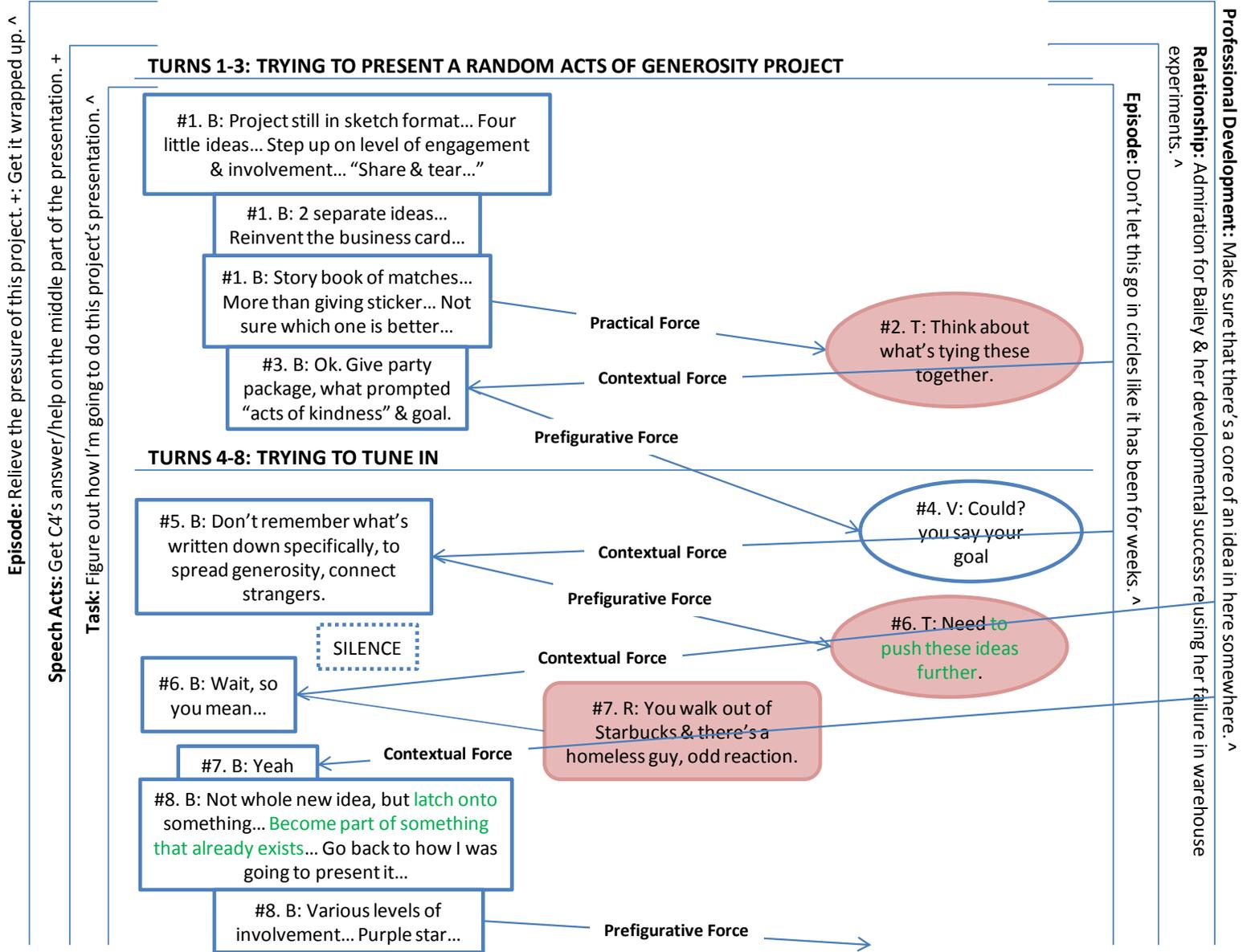
Yellow – bifurcation point

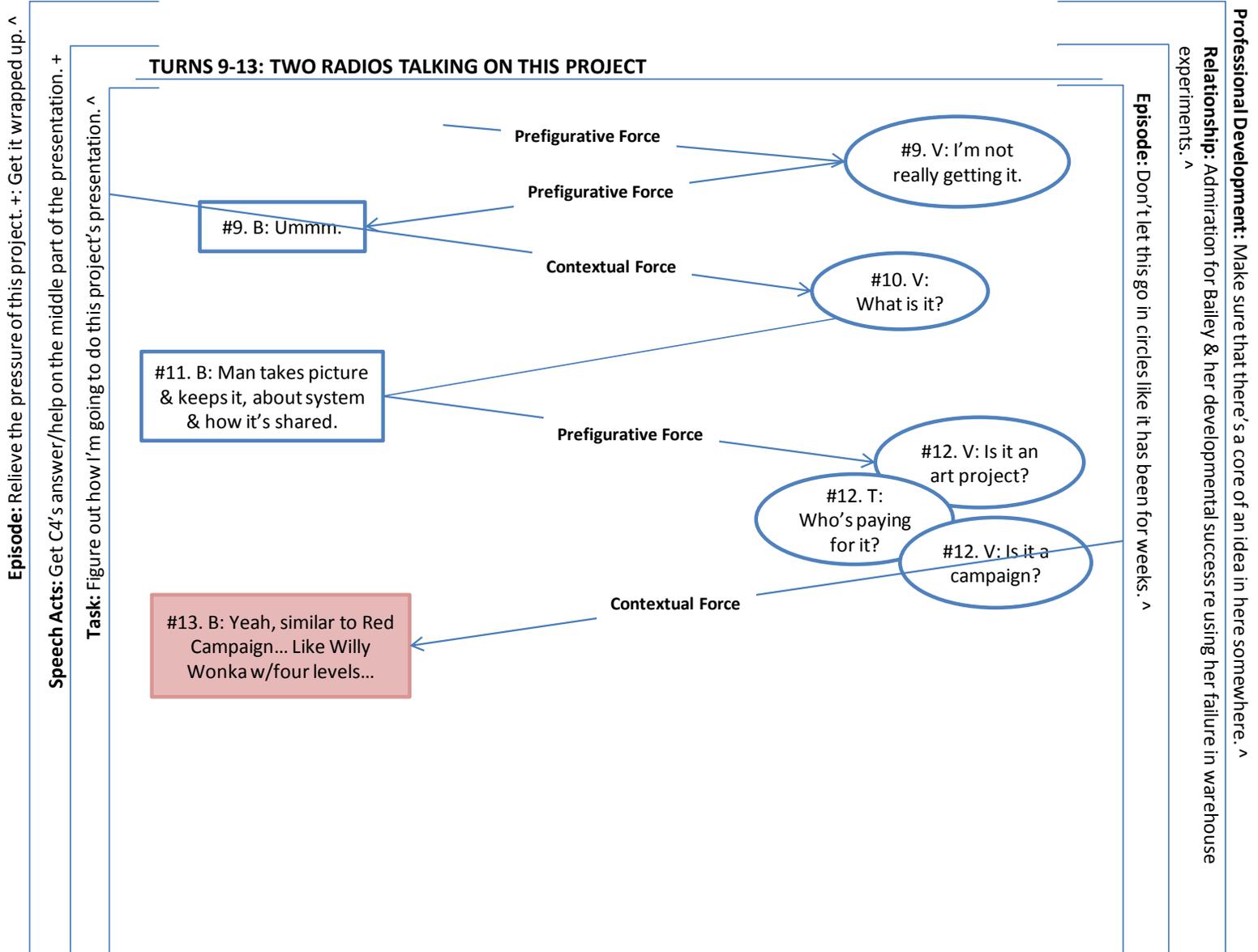
Green text – use of verbs

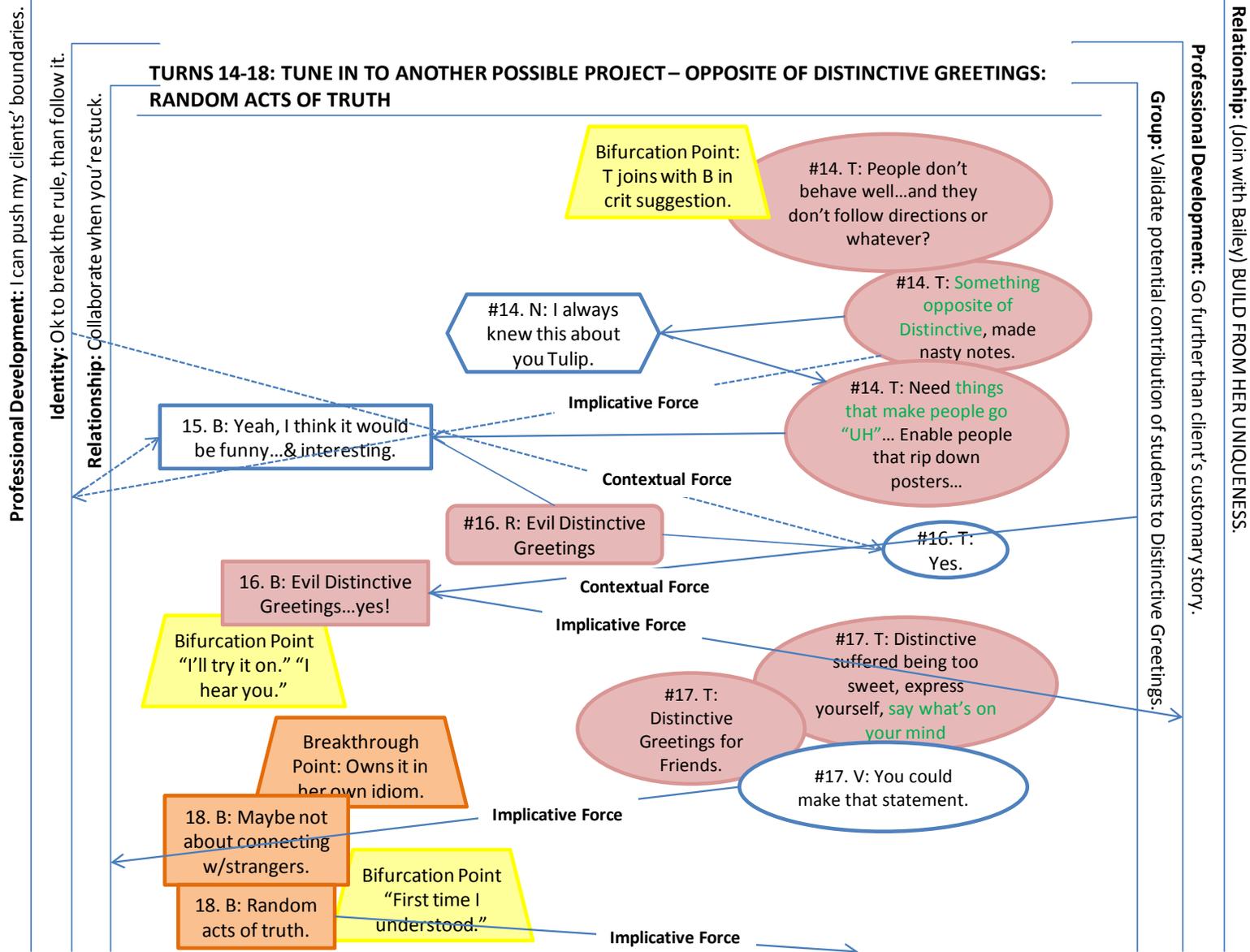
Symbols

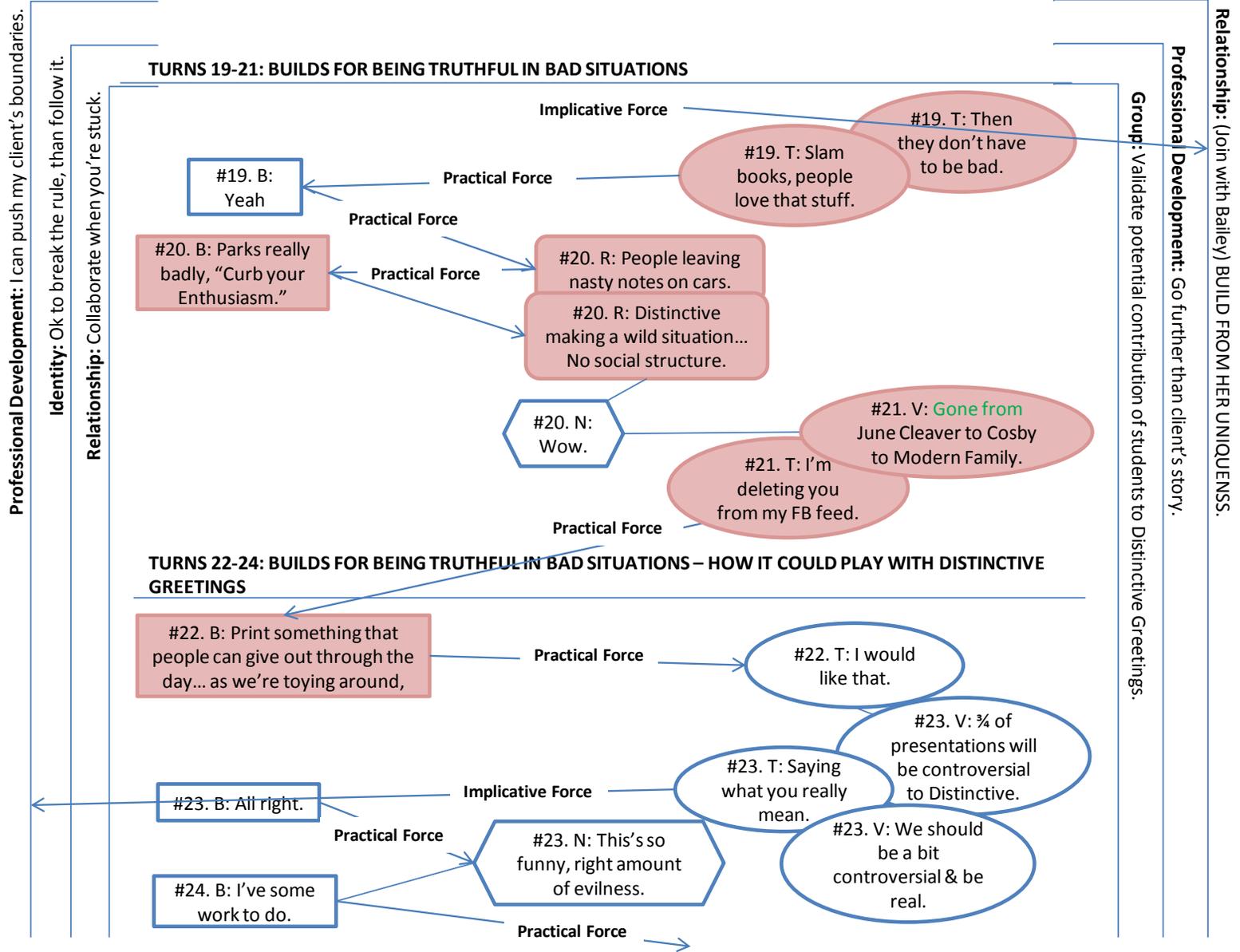
+ - said directly

^ - inferred







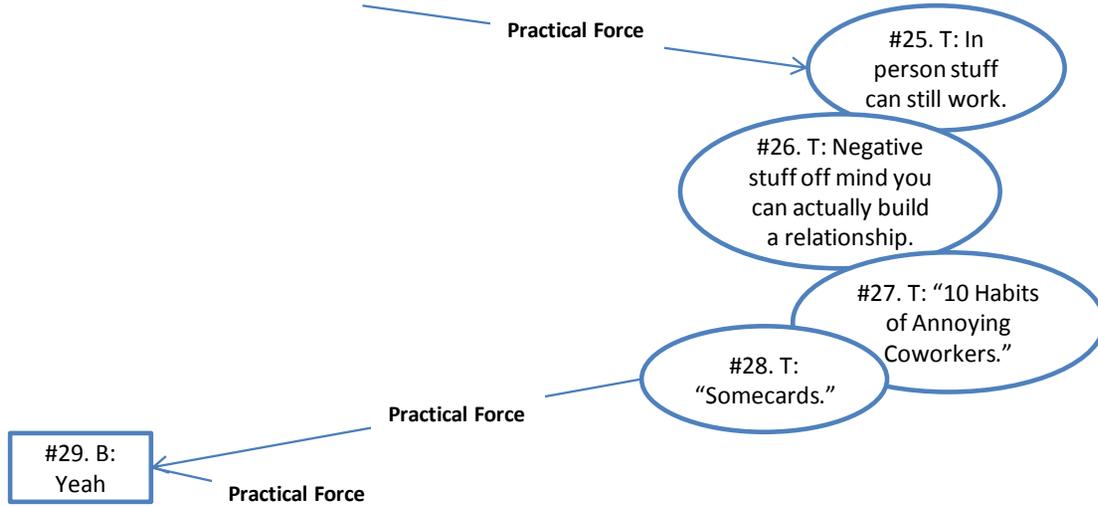


Professional Development: I can push my client's boundaries.

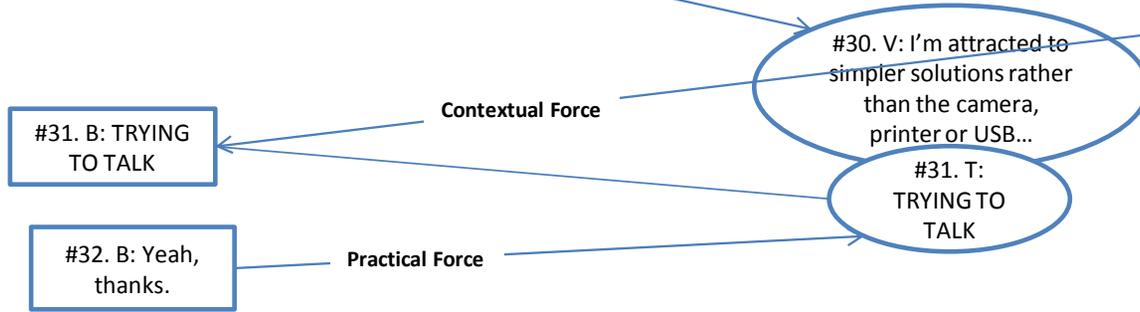
Identity: Ok to break the rule, than follow it.

Relationship: Collaborate when you're stuck.

URNS 25-29: MORE RESOURCES OFFERED



URNS 30-32: ACKNOWLEDGEMENT



Group: Validate potential contribution of students to Distinctive Greetings.

Professional Development: Go further than client's story.

Relationship: (Join with Bailey) BUILD FROM HER UNIQUENESS.

Appendix M2b

CMM Complex Conversational Map (The simple maps with the additional analysis of Bifurcation Points, Logical Force, Creative Breakthrough Moments) of Dora Interaction

Legend:**Shapes & Borders**

Rectangle – Dora speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/borders – actions or unspoken communication

Colors

Pink – figurative language

Orange – creative breakthrough

Yellow – bifurcation point

Green text – use of verbs

Symbols

+ - said directly

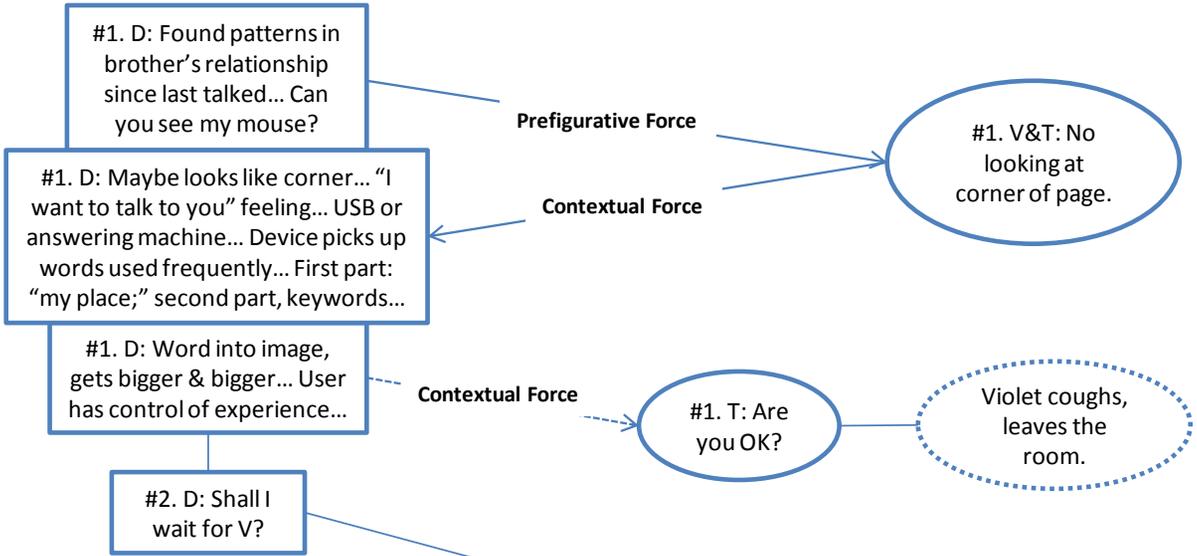
^ - inferred

Speech Act: Get across my idea & be able to tell what they think of it. +

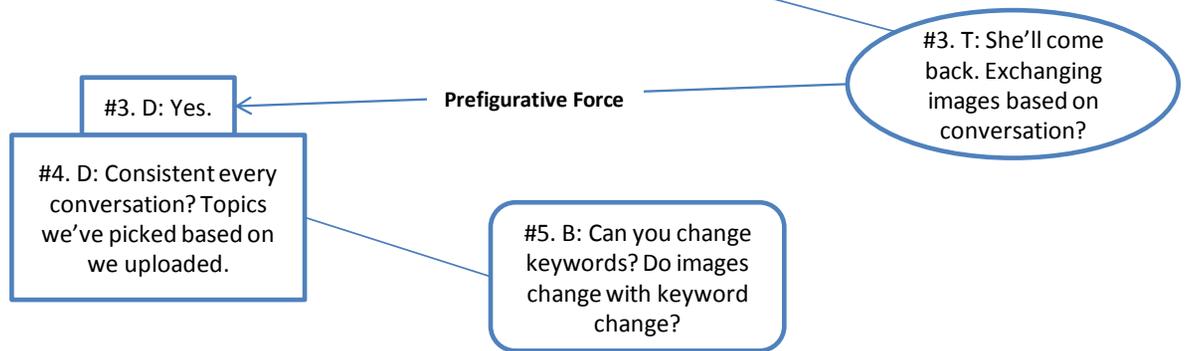
Identity: Let me do well in this interaction with C4 & not embarrass myself. +

Professional Development: Improve my design with their feedback. +

TURN 1-2: PRESENTING JUMBLE + INTERRUPTION



URNS 3-5: ATTEMPTS TO CLARIFY



Professional Development 2: Talk about main idea separately from how you design system. ^

Professional Development 1: Gear & focus of design story rests on what matters in customer's experience. +

Episode: Find way to connect & correct appropriately with TODAY's interaction. ^

Speech Act: Get across my idea & be able to tell what they think of it. +

Identity: Let me do well in this interaction with C4 & not embarrass myself. +

Professional Development: Improve my design with their feedback. +

Relationship: Make sure I am communicating so they can understand it. ^

TURN 6-8: SOMETHING NOT WORKING FEEDBACK

#6. D: Yes. You can add more. Graphic image pops up.

#6. D: Is that clear?

Contextual Force

#7. T: V do you see?

#7. T: I'm having a tough time understanding. PAUSE.

Tulip looks at Violet.

Bifurcation Point

Prefigurative Force

#8. D: Ok, maybe better represented by storyboard. Perspective?

"Open for listening to you"

Implicative Force

URNS 9-11: ACKNOWLEDGE CRIT, METAPHOR (COLLABORATING TO BRIDGE)

Dora witnesses conversation

#10. N: INAUDIBLE

Contextual Force

Prefigurative Force

#9. T: Your drawings are really nice. Embrace experience of consumer.

#10. V: I--

Ned & Violet try to speak at same time.

#10. N: What--

Prefigurative Force

#10. V: Go ahead.

Bifurcation Point: Violet joins Dora relationally.

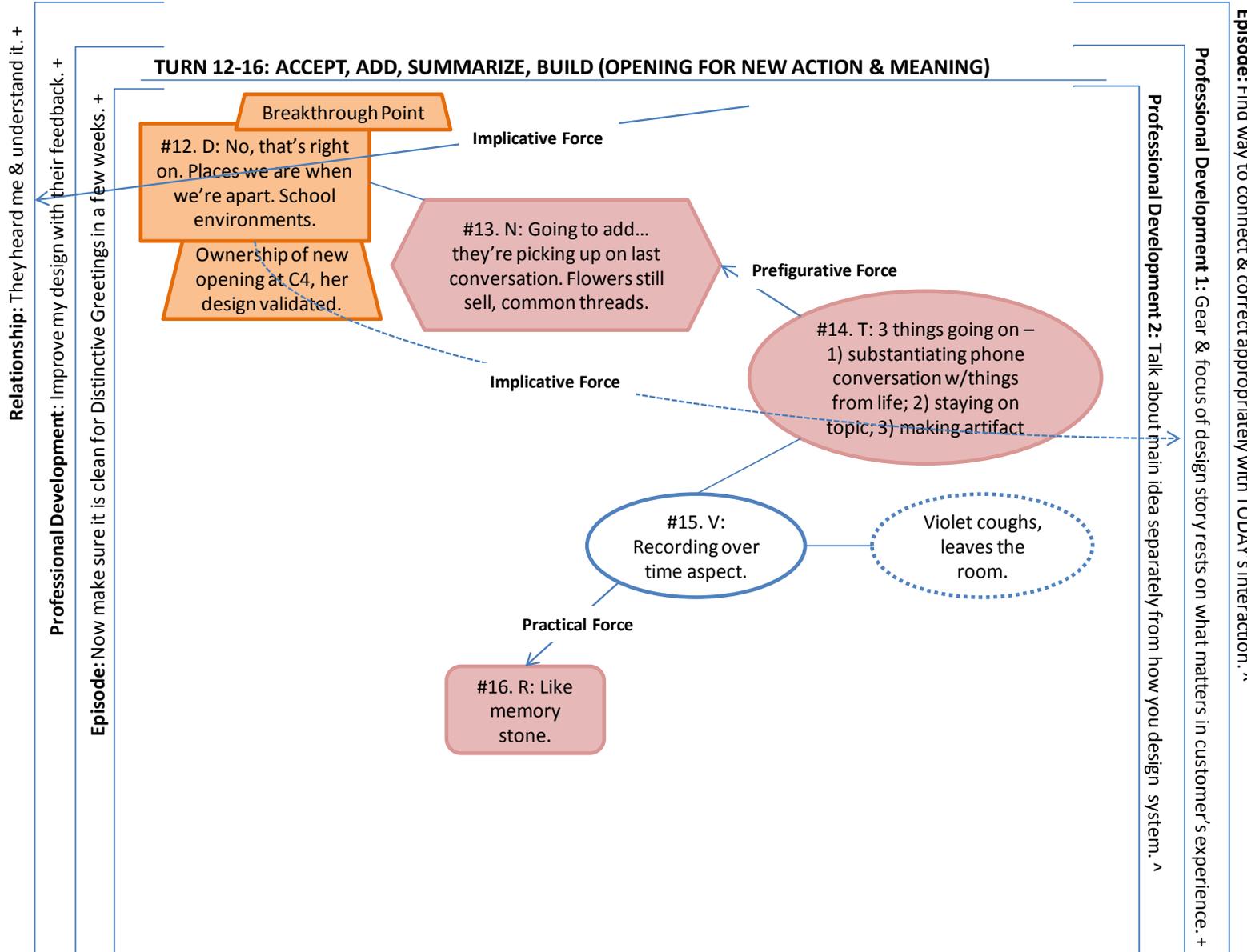
Implicative Force

#11. V: Maybe I've missed a lot... Help me understand. Important for people to talk about tangible things?

Professional Development 2: Talk about main idea separately from how you design system. ^

Professional Development 1: Gear & focus of design story rests on what matters in customer's experience. +

Episode: Find way to connect & correct appropriately with TODAY's interaction. ^



Appendix M2c

CMM Complex Conversational Map (The simple maps with the additional analysis of Bifurcation Points, Logical Force, Creative Breakthrough Moments) of Samantha Interaction

Legend:**Shapes & Borders**

Rectangle – Samantha speaking

Rectangle with rounded corners – students speaking

Hexagon – Ned speaking

Oval – C4 speaking

Trapezoid – breakthrough or bifurcation point

Dotted lines/borders – actions or unspoken communication

Colors

Pink – figurative language

Orange – creative breakthrough

Yellow – bifurcation point

Green text – use of verbs

Symbols

+ - said directly

^ - inferred

Episode: Present the best I can so they understand it; I know it's disjointed. +

Relationship: Show that I heard them from the last time on infographics and creating story. ^

Speech Act: I'm worried about getting a chance to ask about the wristband. ^

TURN 1: PRESENTS PROJECT; PRESENTS KAREN

#1. S: Failure of communication in medical field... Idea of environments for communication that tracks medical history in a visual comparative... Dr. would like to be more rosy... Capture medical snapshot to create story about yourself...

#1. S: Karen at Dr.'s for 10 min, review profile, breakfast food spikes numbers... Didn't realize... Changed her behaviors without knowing it....

#1. S: Karen is 45, diabetic, family history of heart disease, glucose is 267.

Contextual Force

Tulip, Wendy & Violet listening.

URNS 2-5: JOINING WITH SAMANTHA IN HOW TO TELL A LIFE CHANGING STORY (FROM MEDICAL IMPLICATIONS)

#2. V: Intro earlier with her life (toast) to set up realization.

#3. T: Like a light bulb

#4. V: Yeah

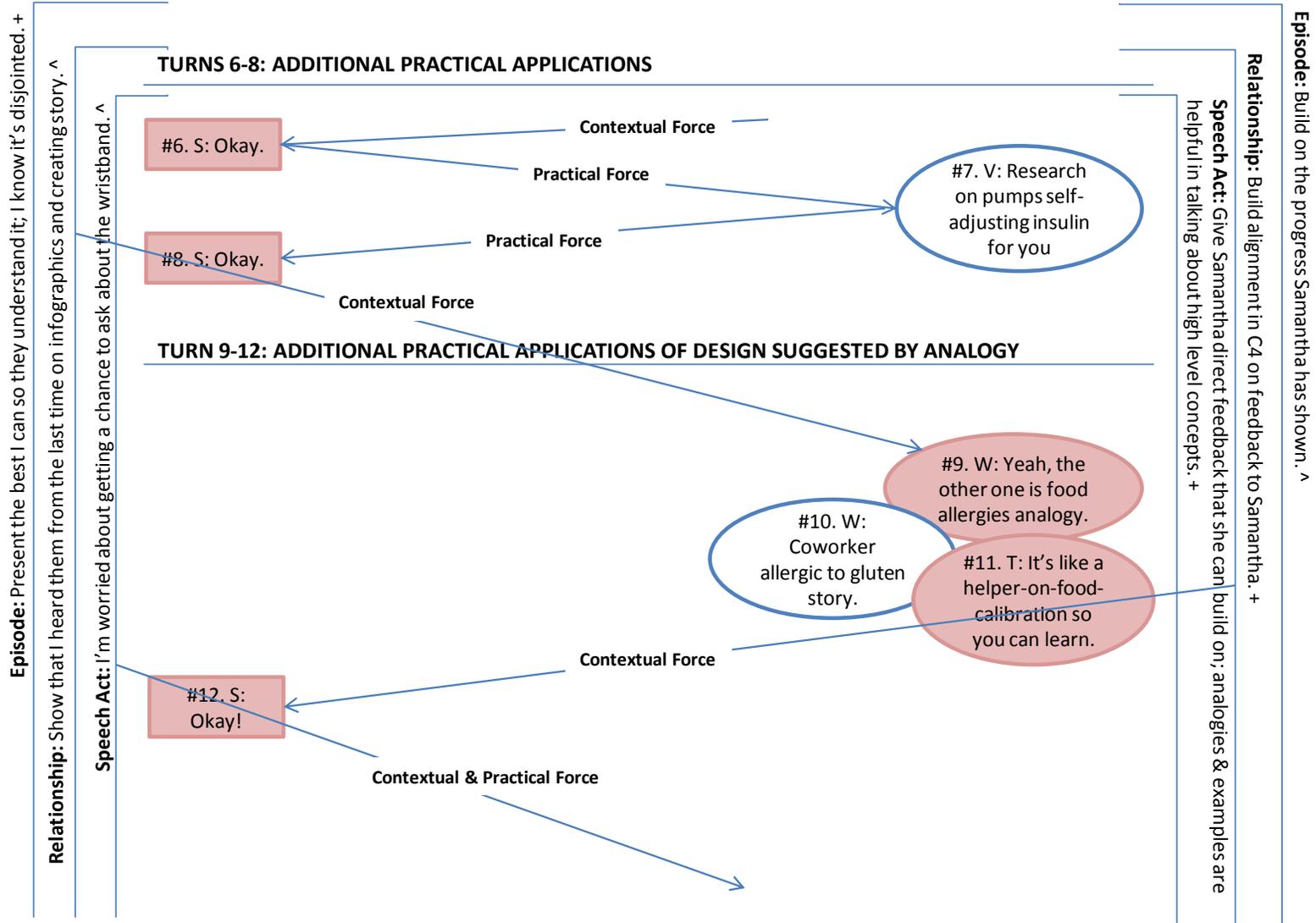
#5. W: Like you're connecting Karen to more of her life & app usages.

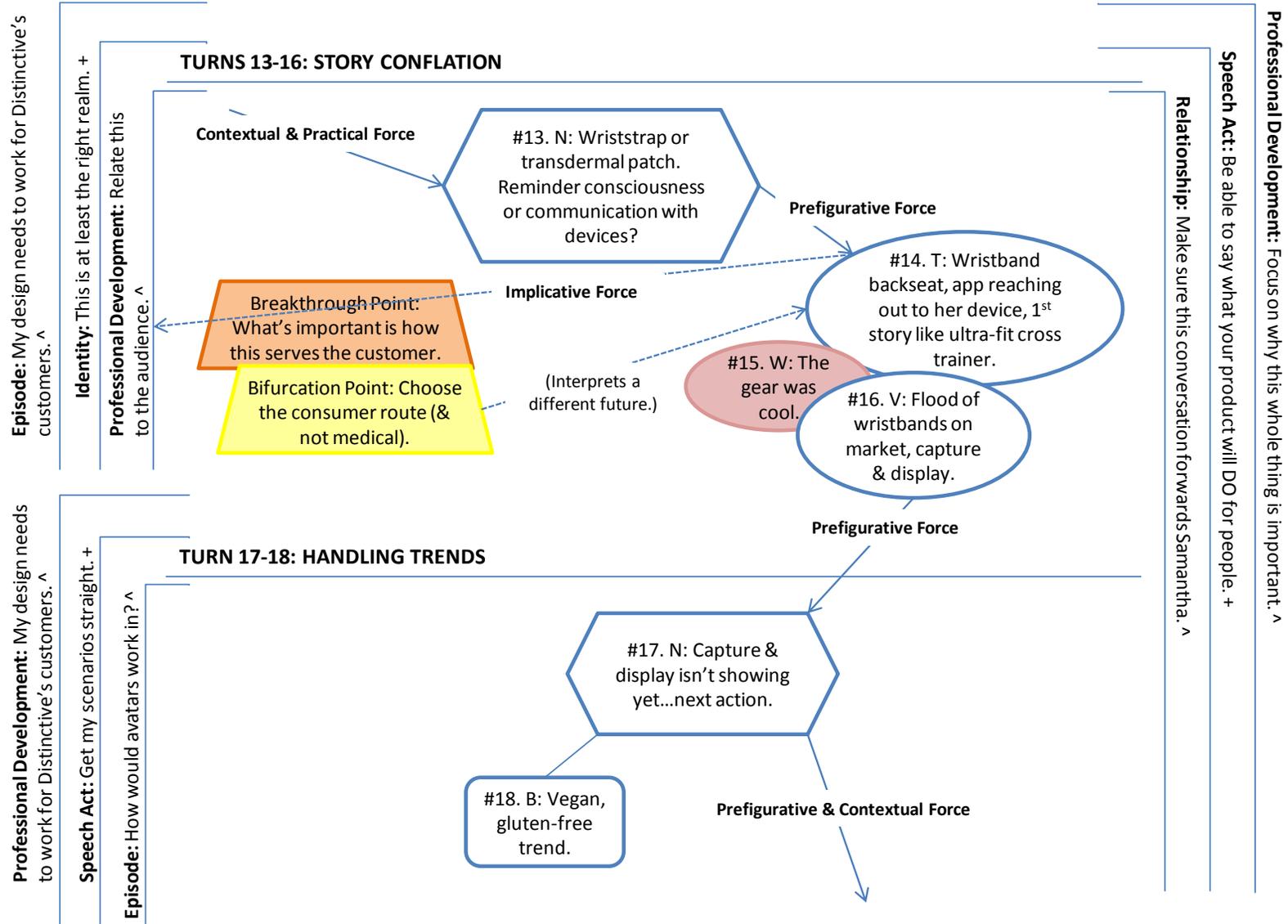
Contextual Force

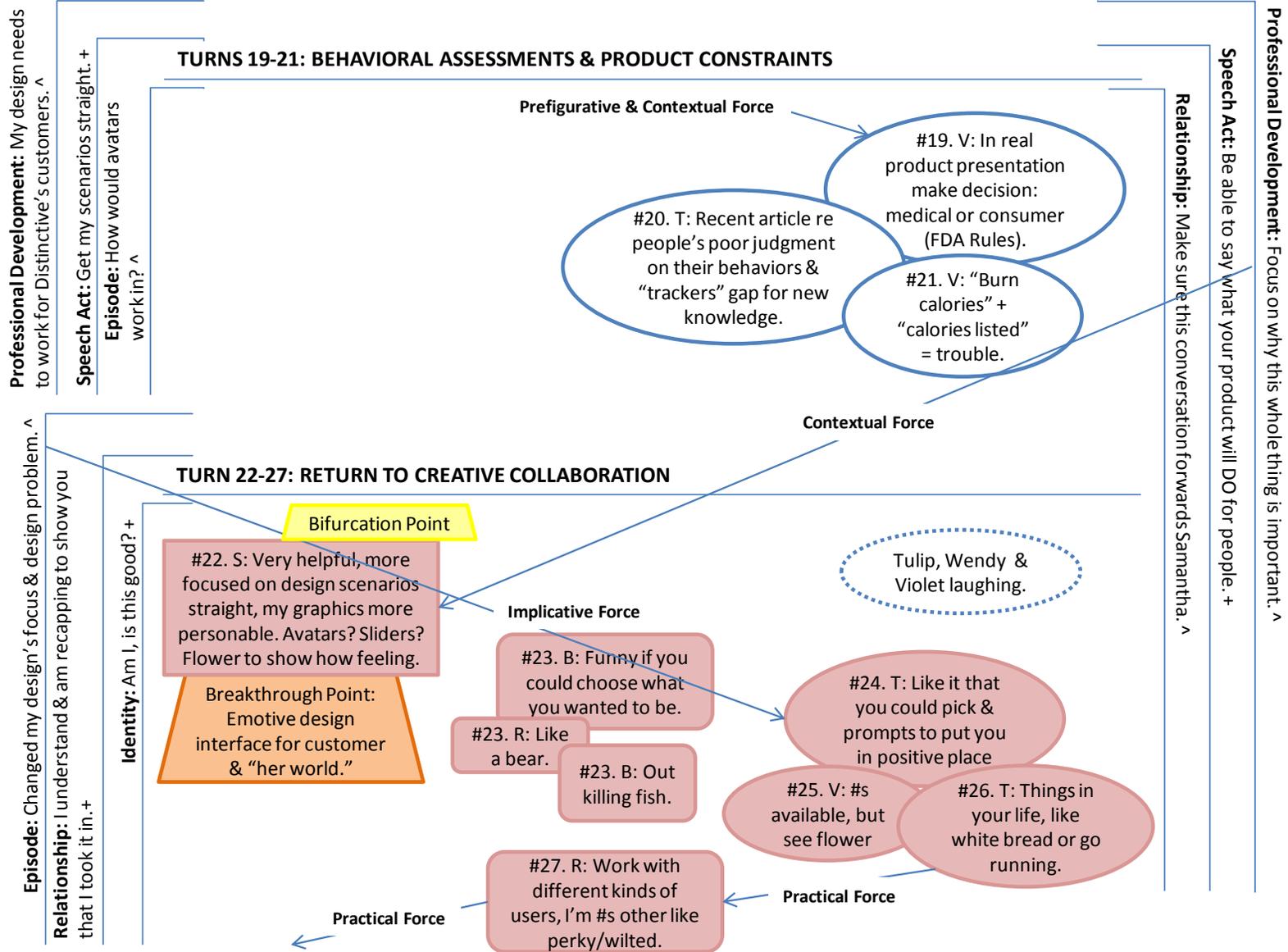
Relationship: Build alignment in C4 on feedback to Samantha. +

Speech Act: Give Samantha direct feedback that she can build on; analogies & examples are helpful in talking about high level concepts. +

Episode: Build on the progress Samantha has shown. ^







Episode: Changed my design's focus & design problem. ^

Relationship: I understand & am recapping to show you that I took it in. +

Identity: Am I, is this good? +

TURNS 28-31: ARTICULATION OF SAMANTHA'S CORE OFFER

#28. S: That's about it, tying Distinctive with this, scenarios are creating such a story, brining emotional side.

Practical Force

Practical Force

#29. V: Good progress, think Distinctive Greetings—is this stuff sharable beyond dr? Mom & flower?

Breakthrough Point: What's important is how this serves the customer.

#31. S: Great, helping people be their best.

Contextual Force

Practical Force

#30. T: Less data driven, add scenario people generally-moods & maintaining best mood.

TURNS 32-33

#32. N: Scotland they say the same, East Coast they tell you! How much can you share with people?

Practical Force

#33. V: Interesting data backup from FB/social media to see how much they talk about mood (a lot).

Relationship: Make sure this conversation forwards Samantha. ^

Speech Act: Be able to say what your product will DO for people. +

Professional Development: Focus on why this whole thing is important. ^

Appendix T1

Transcript of April 10, 2012 Session –Interaction with Dora

Background

This section of the videoconference dialogue between the Levenger students (Dora (D), Bailey (B), Rick (R), Samantha (S) and their professor Ned (N) with C4 (C4), Violet (V), Tulip (T), and Wendy (W) was noted as an example of promising group creativity from the questionnaires. The students were in Syracuse, NY and C4 is in Boston/West Newton, MA (same time-zone).

The students have microphone headsets and wireless mouses that are supposed to be easily used with the screen. The Adobe Connect tool allows a multiple screen display of both live group sites and a power point presentation that a student may upload for display for the benefit of both groups. The camera angle on the C4 participants is wide, thus making the participant's facial features seem distant. The C4 group seems closer to the camera, though fuzzy sometimes. The questionnaires were filled out at the end of the session, anonymously and sent to the researcher. C4 did not furnish questionnaires for this session.

At this particular session, the intention was for the students to shape a more final version of their presentation to C4 for feedback and critique so they would be ready for the Distinctive Greetings presentation in Boston May 7th. The degree of interaction between Distinctive Greetings and the students on May 7th was still unknown due to remaining discrepant intellectual property issues between Distinctive Greetings and Levenger University. Therefore, the students and C4 were uncertain about the degree to which the Distinctive Greetings representative could provide useful feedback about the validity or usefulness of their designs. In addition to this possible future negative distraction, there was a Levenger University photographer to document the original nature of this design collaboration and his movements provided additional current distraction. While sessions were normally 1.5 to 2 hours in duration, this one was limited to only 1 hour, and Dora and Violet had communicated that each would be late. Only Rick and Dora presented in this session. Rick began this session, with Tulip, Bailey, Dora and Ned were in attendance initially, with Violet and Samantha joining later. The presentations were based on an open-ended design brief:

“A scenario that depicts an inflection point in the life of an individual/relationship where the person/people must communicate to family and friends their inner thoughts and emotions....A storytelling and scenario-based character that develops... We'll work with C4 to generate a series of physical and digital artifacts that evolve based on the character(s) and the story....with the final deliverable as a creation of personalized mementos. If successful these might be valued by the family as archival items that are shared and passed on to others....However in order to understand the true depth of the effort, it will be important to first consider the story or context from which these objects were derived. Therefore, the goal is to reconnect with the scenario to validate the work of the group”.

Dora, (D) the student interaction represented here had further specified the above brief for her project as the creation of a “Tool to help develop and sustain long distance relationships between siblings during childhood (where one sibling is much older and the other much younger).” This transcription system is a simplified and modified version adopted from Buttny & Jensen (2002) “Hot Stove League Talk” in Gary Gumpert and Susan J. Drucker (Eds.), *Take Me Out to the Ballgame: Communicating Baseball*. Cresskill, NJ: Hampton Press; 71-93. Reprinted with permission.

| | |
|---------------------|--|
| Word in bold | Word said with increased emphasis |
| PAUSE | Brief, untimed pause |
| () | Transcriptionist doubt |
| : | Extended or stretched sound, syllable or word |
| . | Falling vocal pitch |
| .+ | Voice trails off |
| ? | Rising vocal pitch |
| , | Continuing intonation with slight downward contour |
| ^ | Rising intonation |
| \ | Falling intonation |
| = | Latching of contiguous utterances |
| [] | Speech overlap |
| SILENCE | Longer silence than a brief, untimed pause |
| ~ | Audible out-breaths |
| Hhh | Possible laughter |

| Turn # + Tech Difficulty | Line Numbers | Language Content (The Said, including silences and pauses as part of the unsaid in the said) 24 minutes into the hour, D begins. The group has only an hour for their work. | Other Communication (The Said in the Surround: Non-verbal, paralinguistic [voice tones, gestures], energy, pacing, etc.) |
|---|---|--|--|
| 1 -Trying to get the storyboard up on the screen so Continuum can see it... speaking while she is doing that 7-Can't see the mouse points on the screen -Outside noises interrupting -Camera Guy angling shots throughout this presentation. -D is showing approximately 3 slides while she is | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 | D: Umm, so trying to remember the last time was when I got to talk to you about my project Violet? But ummm in the last couple of weeks, I found some patterns? in my brother's and my relationship? where it's broken up into phone conversations over the year and a kind of a reunion? once a year for a week or a month, and picking up on those patterns ummm I tried to focus umm on a couple of things and its changed over time or become more specific.+ Can you see my mouse, where I'm pointing? JV & T: NO- we're looking at a corner of your page we think... D: Really or maybe it just looks like a corner.... D: So there is a feeling of 'I want to talk to you and I'll see you soon' and a sense of I want to share my place with you when I am talking on the phone. So there is two aspects. There's a device, or object like an answering machine, and a USB that has a program to connect both of you, and it's an interactive database and an interface....and this will become clear in a little bit \I/ ::Just looking at the phone section of the storyboard PAUSE This phone answering/recording device I buy at the store and then come home first and give it a sample conversation so it can pick up on my voice, common topics we generally cover, and words that are used frequently. It can recognize the words that we're saying, and picks up on the specific words:::but that will come later.+ The last part of the set-up is uploading a picture of 'my place' for each of us, and the place I want to share with my brother is a café near my university | Violet eating lunch. R looking at D, B, N looking at the screen, S looking at D or the screen. (V straining to see), Tulip intent on screen/hand on mouth Throughout D speaking, T & V still eating – intently watching the screen as D coordinates her storyboard slides to what she is saying and trying to show. R is writing, S, N, B all looking at the screen. All Levenger and C4 participants intently focused on the screen V & T still eating D is leaning forward – towards the screen in her room; animated yet slow pace, smiling R looking at D, S looking down and writing, N looking across the room, B looking at the screen. V & T intently looking at the screen. |

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| speaking and the rest of this is going on, showing the overview concept, how the phone activates the virtual interaction database and the basic interface. | 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 | and his is his classroom. The second part to the phone aspect is the keywords selected by each user, based on the ‘my place’ photo. So I am looking at my brother’s photo, and I am picking out the things that maybe interest me: maybe the beanbag, the floor mat, these are my keywords that he doesn’t know, so I’ve inputted into this program, “table, legos, sandwich, because I know he has lunch there.+ , and the approximate time I meet him there...” | D is animatedly gesturing with her hands, pantomiming how the sandwich is getting bigger. All Levensger participants are now focused on the screen. D Really stresses how her brother is excited |
| -D showing the behind the scenes storyboard slide of the phone activated program | 42 43 44 45 46 47 48 49 50 51 | ...Next is a behind the scenes and what happens...While we are having this conversation here? talking about a sandwich and a dog, umm he hits on one of my keywords, ‘sandwich’ and this program picks up and that, and it turns the word into an image ^ so now, on the background that we upload his image of the school, and up pops images of the keywords, like ‘ sandwich ’ I know he’s been excited about a cool sandwich and after frequent use, let’s say over the course of a week, we talk about school and talk about sandwiches a lot, and he has discovered this amazing sandwich, the program picks up on the keyword that is used a lot, and the image gets bigger and bigger and bigger and the words that you are speaking become physical. So this comes into play in a virtual interaction?, and after a phone conversation that we know is being recorded, ummm for example I am using my brother, he says “bye” because he is excited to say it , because he knows he can go to this program and look at the sandwich because it got bigger, and maybe it even exploded because it got so big because we’ve been talking about it so much, and he knows we haven’t been talking about his friend Olivia who is really tiny in the photograph, so MY experience is that I see his school and his key images and he sees my café and my key images....ummm | T tilts head; V begins coughing. |
| -Camera Guy leaves the room | 52 53 54 55 56 57 | So there is the verbal to visual, and the user has control of their experience and it is also a stimulating prompt for a conversation. And the one time a year we get to see each other there’s the reveal and the exchange of these images, and I finally heee get to see his | V coughing harder—rises to leave the room, Dora notices and laughs nervously as Violet departs T turns to Violet, interrupts D talking, speaking to V; D keeps on talking, T looks back to the screen, S, R looking down, N and |

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| | | keywords.+...]T: Are you OK? ...café and what my brother has been looking at this entire time, and he gets to see his classroom the way I have been seeing it | B looking at the screen |
| 2 | 58 59 | D: Shall I wait for Violet, will she be right back? Are there questions so far? | B & S looking at their computer screen or papers. R watching D |
| 3 | 60 61 62 63 64 65 |]T: I think she will come right back, ummm, so...]OK, so essentially ummm, you guys are exchanging images based on the conversation you're having? your image will be PAUSE what he's talking about? and his image will be what you are talking about? but you will only be able to see::: what he's talking about until you come back together? D: Yes. \I/~ | T speaking over D (while she is explaining) T using her hands for emphasis, gesturing like putting something down on the table. R looking down. B stretching. |
| 4 | 66 67 68 69 70 71 | D: What's consistent is every^time we have a conversation ?ummm is the images we uploaded so the environments that we've.., or rather the topics that we picked based on what we uploaded and what changes is the sizes of the images and the interactions that we are placed in, for instance the gentle interaction with our. \I/ phone conversation that are on the computer screens \I/ <i>and can be saved ummm</i> | D tone of voice getting higher and on the word 'conversation' she inflects it at the end like a question. V comes back in room. |
| 5 | 72 73 74 | B: Can you change your keywords? Like a roast beef sandwich? from turkey to ham? Do the Images change when the keywords change? | B with excitement/interest-looking at D. V scratching her head, T looking down. |
| 6 | 75 76 77 78 79 80 81 82 83 84 | D: Yea, we can change for sure PAUSE Not change but add more keywords. As conversations develop, not the sandwich now, maybe the fruit roll-^up that is \I/my brother's new favorite things\I/. My idea is that it will become cluttered by the end.+ A dynamic that happens over time that changes.+Huge pile of images superimposed on the picture screen=so you upload a new place....\I/when full it is a new threshold and time for a new topic.+ (slide referral) So I have kind of simplified? The design of it? the interface? These four images up top are kind of like a mood board | V is still looking at the screen; T is looking at the screen, eating D is addressing the new slide now, and the basic interface. R looking down, all others are looking at the screen, V's arms |

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| | 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 | <p>type images a kind of visual language.+ that sits on your desk here by your computer and lights up like an answering machine, so once you do hang up the phone after a conversation—maybe you're out and you come home PAUSE maybe hanging by the computer and when home it glows there if the program is open and then a graphic image pops up=that tells you a message is waiting for you=a light that is flashing, maybe I create a new place for this by the \\/computer PAUSE Then the program opens up #2 PAUSE and it's a graphic image like the top left corner taken from an interactive game with a train and tree branches with this type of aesthetic ahhhh so it's a 3D phone PAUSE ahhhh communication travel answering machine? that you bought and is now as an image on the computer screen=and the suitcase opens up and lays flat and your image of your places represented and this is how you interact....umm interact ummm</p> <p>SILENCE</p> <p>D: Is it clear? I know it took a while to get here but ummm?</p> | <p>are crossed in front of her at her waist.</p> <p>All looking at the screen.</p> <p>V looks at T</p> |
| 7 | 101 102 103 104 105 106 107 | <p style="text-align: right;">]T: =I am having</p> <p>a tough time understanding ummm PAUSE the set up PAUSE and the conversation around specifically these objects?</p> <p>PAUSE</p> <p>T looks at Violet, says "oh Violet do you see?:::"</p> | <p>T leans in –uses her hands for emphasis 4 times to mimic each object that D referred to as she speaks. T looks down after using her hands</p> <p>T looks back at V:</p> |
| 8 | 108 109 110 | <p style="text-align: right;">]D: Okay...Maybe it would be represented better by a storyboard...maybe from one perspective? my brother's perspective?...confusing when I was trying to explain</p> | |
| 9 --Hissing noise | 111 112 113 114 115 | <p style="text-align: right;">]T: That</p> <p>might be nice and your drawings are really nice (head at angle eyes towards screen) and it feels like there is something there::...but maybe "Embrace like the experience of the consumer", instead of talking about the system <i>right now</i>::, at least for me the system is</p> | <p>T talks over D, forcefully T looks at V twice. R is looking down.</p> |

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| | 116 | con-fusing right now without understanding the experience right now | |
| 10 (Audio picking up skipped words/garbled) | 117 118 119 120 121 122 | Ned: (inaudible speaking)]Violet:::I [Ned: What] Violet:::'go ahead' SILENCE | V and N trying to speak at the same time |
| 11 | 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 | Violet: Maybe it is because I have missed a lot of the background of this, but what would help me to better understand.. like what the big idea of this in <i>words</i> . + because a gap between your brother's age and your age \// I don't know.+ I was just on a business trip yesterday and met with a bunch of different people and everyone was like =WOW really cold today=what's the weather like in Boston, I might have heard that 10x, and maybe it is what people can have a discussion about when they have No idea about who you are, but I'm wondering if I am making the right kind of connection here? maybe what you are saying is that the things you surround yourself with say a lot about who you are?= so it is important for the other person to see that, and important for people to talk about tangible things ? so they begin to have a dialogue, or am I just, making that up...? <i>PAUSE</i> | V leans in. She sounds congested, like she has a headcold. N is nodding his head. V brushes her hair back V uses hand gestures like pressing down -V uses a speculative tone of voice -D leaning in -On 'tangible things' V nods her head affirmatively T eating |
| 12 | 140 141 142 143 144 145 146 147 | D: No that is right on...because Travel is an aspect of my relationship with my half-brother, so places where we are when we are apart have a lot to do with what we have to talk about when we are together ?...I of course go to school as well and so seeing his school environment is important to me, and where the relationship develops a starting point possibly ...and where we do meet in Iraq...he knows I go to school, his school is there and I go to his school, and maybe that is where the relationship everything comes | N looking at D and nodding his head. B, S, R, and N looking at D. -V nods head affirmatively |

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| | | together to real life in our relationship... | |
| 13 | 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 | Ned: I was just going to add...As D: and I have talked about this PAUSE the baseline is the phone conversations between the 2 of them: ahhhh...which we know there will be another phone conversation in a few months, or whatever jumps in time they decide to converse, so they are picking up on the last conversation, so if that is the constant then it's the weather or other things to talk about, then it's the question of keywords or overlaying other conversation enhancements into the game, is it a game or not, in the case of the physical objects, if you are going to pull out something from the box that you share between the two of you, is it something that gets customized from time to time, the physical customization, keywords give objects or the environment, another way to say thing is a way to try to effortlessly morph and change the content by just carrying on with the conversation. If the prompts help direct that and you can build off it... How could it visually look different, or what can you pull out is the conversation starter that helps...when it comes down to Gifts: flowers still sell (Ned Hhhh)! FTD is the same set of roses, but it's not the same. So there are some common threads which are standardized and mass created, but with language there is a chance to do rich, wonderful things. I think this is an attempt to try to move into that level of conversation, what are we sharing with these screens? Can we see what another is seeing, a la battleship, or gaming?—Then what is the reveal when we see face to face could be wonderful. This is an attempt to push some of those underlying ideas. Maybe I am saying what you two said, but I said it in my way...so...hopefully it triggered some other thoughts... | -All students attentive to Ned -T nods head yes -Ned maintains steady gaze to screen-to V & T -Both V & T hold their heads in one hand -T shifts, hands in lap -T pulls side chair over to lean on , looks away and back at screen -Ned emphasizes 'still sell' with louder tone and only looking at students which he does until the phrase 'that level of conversation' -T shaking her head yes on Ned's utterance of 'reveal' |
| 14 | 171 172 173 174 175 176 | JT: I see three things going on – 1) Substantiating a phone conversation with more things from your life; 2) Staying on topic, or having the prompt to continue the conversation or <i>pick up the threads where you need them to</i> —not like brushing your teeth and talking to your brother about that; 3) Making an artifact out of all the things | -T interrupts and begins speaking on Ned's utterance of other... -T looks at V -B looking at T -T uses hand gestures for emphasis on the phrase 'pick up threads' |

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| | 177 178 | | -D looking down -S shakes head yes |
| 15 (inaudible) | 179 180 | V: Recording over time aspect JT spoke to Violet | -T an emphatic yes (something) to V as a sidebar |
| 16 | 181 | Rick: Like a memory stone, or a string on the finger | |

Appendix T2

Transcript of April 20, 2012 Session—Interaction with Samantha

The total session time for the entire class on April 20, 2012 is 2 hours. The feedback from the questionnaires resoundingly spoke about the how the “brainstorm bits” and “builds” seemed promising and interesting for their creativity as a group at this session, although not one student’s name is mentioned specifically. Therefore, I watched this entire class session several times and selected this specific interaction with Samantha as the student interaction where ideas were more freely bantered and exchanged amongst and between participants. The intention is that each student presents. I also observed this session real-time. Technical difficulties at the start took about 7-8 minutes. C4 participants (Tulip (T), Violet (V), and Wendy (W)) were eating their lunch while engaged in this session. The Levenger participants were Samantha, Rick (R), Bailey (B), Dora (D) and Ned (N).

Samantha, or “S” is the first to present after about 7-8 minutes of trying to deal with who is going to present on this day, some group concerns: final presentation date, where, when who’s there, Romi and the Group Ed session, and Distinctive Greetings’ representation.

Samantha’s concept is an attempt to bridge the gap in doctor and patient relationship communication as most office interactions are only 10 minute interactions. Samantha is the first to present and had presented Scenario 1 with Aaron, a military guy who uses the medical wristband to keep himself buffed and ready for action with feedback from W, T, and V at C4, and is now presenting Scenario 2, about Karen, a diabetic young mother. Her total presentation time is about 25 minutes, the first portion is about her total concept (represented in the transcript), then Scenario 1 (not represented in the transcript), and then with Scenario 2, representing approximately 16 minutes. The transcript below primarily concerns Scenario 2, about Karen.

Samantha shows 4 slides to accompany her Scenario 2 presentation. This transcription system is a simplified and modified version adopted from Buttny and Jensen (2002), “Hot Stove League Talk” in Gary Gumpert and Susan J. Drucker (Eds.), *Take Me Out to the Ballgame: Communicating Baseball*. Cresskill, NJ: Hampton Press; 71-93. Reprinted with permission.

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| Word in bold | Word said with increased emphasis |
| PAUSE | Brief, untimed pause |
| () | Transcriptionist doubt |
| : | Extended or stretched sound, syllable or word |
| . | Falling vocal pitch |
| .+ | Voice trails off |
| ? | Rising vocal pitch |
| , | Continuing intonation with slight downward contour |
| ^ | Rising intonation |
| ∨ | Falling intonation |
| = | Latching of contiguous utterances |
| [] | Speech overlap |
| SILENCE | Longer silence than a brief, untimed pause |
| ~ | Audible out-breaths |
| Hhh | Possible laughter |

| Turn # General Context + Tech + Difficulty | Line Numbers | Language Content (The Said) | Other Communication (The Said in the Surround: Non-verbal, paralinguistic [voice tones, gestures], energy, pacing, silences, pauses, etc.) |
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| 1 Showing powerpoints while presenting; not reading | 1 2 3 4 5 6 | S: Can you hear me ok? (twice) Just to state my problem again, umm, my problem is there is a failure of communication in the medical field where doctor patient relationship is at risk and I am trying to bridge that gap. And so..umm...Through a lot of brainstorming umm ...I had come up with | W & T looking at Samantha & screen, Violet looking down at iPad; then Violet looking up as Samantha gets into restatement of problem, etc. |

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| <p>slides</p> <p>(14 min in)</p> <p>Re-visit of idea & idea framework, research,</p> <p>17: 54 min in</p> | <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p> <p>28</p> <p>29</p> <p>30</p> <p>31</p> <p>32</p> <p>33</p> <p>34</p> <p>35</p> <p>36</p> <p>37</p> <p>38</p> <p>39</p> | <p>the idea of environments for communication that tracks your medical history creating accumulative information in a visual comparative, and we talked about last time that my [infographics] need to be — personable, readily understood, so even if you're not in the medical field it's understandable</p> <p>This is where I started and I originally thought of a printout at the Dr.'s office, but why limit it to just a printout, so we had looked ahh kind of at what happens what happens just before you go to the Dr.'s office, what happens during and what happens after you are at the Dr.'s office. I had created a few storyboards and scenarios of what could umm happen. Umm</p> <p>And revisiting there is a trend that I noticed when you are at the Dr's office, the Dr. doesn't always like to always focus on the negative if you have something going on , and um would like to be more rosy in the response so in this way, if you have all the information you get everything at hand so the Dr. can focus more on the positives and lead you through to a more effective experience</p> <p>And so in research I found that the moment you step in the Dr.'s office and you physically see the Dr.to when they leave, the appointment is roughly approximately 10 min, during this time so what you talk to the Dr. you need to be to the point and really focused because if you were waiting hours before you want to make sure that 10" is valuable and used well.</p> <p>I have the opportunity here to capture a medical snapshot and we talked about having health diaries and um as far as Distinctive, great opportunity to create a story about yourself and kind of watch the process, and by no means do I think this should eliminate the Dr. by having devices that can record your medicals, but overall I think the analysis you have prior going into the Dr.'s office can lead to better</p> | <p>T writing. V & W looking, V's head in hand</p> <p>S points and gestures on the table; D playing with hair</p> <p>Using hands in sweeping motions across the space in front of her</p> <p>S uses hand gestures to emphasize how the user could know about him/herself by pointing to herself and the variety by switching her hands from side to side</p> <p>Hands together pointing to either side of her, and mimics filling out information</p> |
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| <p>(18:35 min in, Samantha presents first Scenario, Aaron Lee, 20 yr old in military. Vigilant about his health.</p> | <p>40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72</p> | <p>questions and better answers when you are actually with your Dr. And so it can also for each person they can find the degree of usefulness, so whether somebody they feel they can use this product a lot they will, and another person who is playing around with this a little to know more about themselves even if they don't have something chronic, they can do that as well.</p> <p>And so I was doing a little bit of research and you had mentioned the FitBit and Nike+ and they have really broken it down nicely, and I've noticed that all of them have something tangible besides an app or website and something you can wear – possibly a wristband or something that can check your vitals and so that you don't have to fill out all of your information, but that it record it before you get to the Dr.'s office, and with my scenario's you can see that there's room for other things.</p> <p>(Presents Scenario 1 on Aaron)</p> <p>Scenario 2: Karen is 45 yr old an ummm chose diabetes because honestly that is what I know most about</p> <p>=and so I chose that for her but um she has heart disease in her family so she has to watch out for that too—so for her mainly it is focusing on keeping her healthy because she has diabetes (inaudible) and preventing further complications because of her family history, umm so she like Aaron logs in a few times a day and she checks her umm glucose, she has a pump for her (inaudible, slide changed)</p> <p>So on umm April 20 2012 at 10:30 she umm (inaudible) was notified</p> | <p>T looking down; V writing; W looking at the screen. All the students but Samantha have hand over their mouths chin in fist.</p> <p>V, W, T build on each other though talking to Samantha</p> <p>W, T, V --all leaning slightly into the screen and T with chin in fist: V nodding yes</p> <p>B re-doing her hair, D looking down and writing. S has head tilted to the said and is using her hand gestures for emphasis</p> <p>S uses raises her hand 'high' to emphasize 257 T nodding head; on 'lower' S lowers her hand down, and tilts her head down</p> <p>S acts out the pump, hands clasped and pumps for emphasis W arms folded & nodding; T</p> |
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| | <p>73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96</p> | <p>that her glucose was at ah 257 which is very high^</p> <p>and umm so she needs to adjust her insulin because she has to um lower\ /</p> <p>um, her levels. So because she recorded that through her pump which (inaudible) which is synched with umm the app and the website, while she is trying to adjust that (inaudible) umm ring recorded because throughout the day because she has to adjust those levels she works on exercise and eating? but she is a little bit confused about what her diet should consist of um and she thinks that's why^ umm her levels were spiking^</p> <p>So a few weeks later when she goes to the Dr.^ and cause she has only about 10 minutes to talk to her Dr.+ umm they focus on a few questions that he's noticed when reviewing her umm profile. So he ahh says, "What have you been doing to adjust your exercise and eating to your overall diet based on your glucose readings?" And he says, "I can see on the 20th your numbers were really high in the morning, let's talk about eating properly, because I think your choice of breakfast food is causing your numbers to spike". She was unaware that she was having a lot of toast in the morning and because ah umm white bread turns to sugars really fast^ her numbers were spiking(inaudible)</p> <p>So she's aware to notice that now and it goes back to her and her little food pyramid and she needs to focus more on her diet and realize that certain things were hurting her. And her diabetes. I guess that was kind of a little bit you said before that she wasn't really aware of something but wasn't necessarily umm helping it right away, but helping her notice what was causing the problem umm, so that's the scenario...</p> | <p>writing; Ned writing=</p> <p>Violet writing</p> <p>S raises her hand high</p> |
| 2 | 97 98 | #2 [V: It would be nice cause PAUSE um, you're telling most of the story at the end um, so it would be nice if you would start off when you | V using hand gestures – most of the story hand at the end drawing |

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| | 99 100 101 102 103 104 105 106 107 | introduce her and talk about that you know she is a busy mom or something and the scenario is they just switched daycares you know, and then at the end you could say like for example, and “ I didn’t realize I was eating so much toast (Nodding her head) because I didn’t you know and now because I know I have to leave a half hour earlier it is easier for me to grab a sandwich (inaudible) instead of the cereal I was eating”, something that like makes something^ that sets up the scenario where it suddenly dawns on her that she’s changed her behaviors without really knowing it::: S: WRITING, nodding head yes more emphatically | circle in the air—then on the table-arm outstretched, one position to another S writing & leaning in to table [W leans in looking at V, W smiling, V beginning to smile |
| 3 | 108 | #3 [T: ...like a light change... | |
| 4 | 109 | #4 V: Yeah; T, V, W all smiling, looking at one another—saying ‘yeah...’ | |
| 5 | 110 111 112 113 114 115 116 117 118 | #5 W: Yeah, the other thing PAUSE I was thinking of, the thing I really like about this story is that you were connecting um her medical information to um, her life and I felt like I wanted to see more of that in your story, so I think it would be worth describing how she uses the app, “ I wrote down I that had toast in the morning” and that as she logging her daily life it is also logging her medical information so then the Dr can see those things side by side (inaudible), I think that is in your story but I would love to see that more (inaudible) I think that is a critical part... | W drawing imaginary lines on table and then hands side by side, while facing students, V & T looking at W while she is talking and then imaginary sections on table S writing and shaking her head affirmatively; Bailey and Rick looking distant.. |
| 6 | 119 120 | #6 [S: ok, nodding yes, WRITING, ok,[V: Head nodding yes, looking at W, [T looking at W;[S nodding yes | |
| 7 | 121 122 123 124 125 126 | #7 V: Yeah, it would be good, I don’t know if you have done any research on pumps, but t would be good just to know in case someone pokes at it, if insulin pumps are (inaudible) I think in some cases you are plugging in to the pump what you’re eating and then it’s adjusting insulin for you ... | V, S, and T all in same body position: right elbow on table, right hand under chin V beginning to turn to W & T, W looking at V, T looking at W (tone seems excited) |
| 8 | 127 | #8 [S: nodding her head yes, WRITING, ok | |
| 9 | 128 | #9 [W: (Nodding head yes), Yeah=The other one= I was thinking of, if | T, V nodding head, head turned |

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| | 129 130 131 132 | that becomes an issue^ was one that is becoming an issue are people who have food allergies, that is another analogy here to (inaudible) [V: Umm, nodding yes | towards W and really focusing on her, T writing. (tone seems excited, gathering energy) |
| 10 | 133 134 135 136 137 138 139 | #10 W: ...we actually have a co-worker who once he found out he was allergic to gluten he almost went through this exact same situation^ -where he umm didn't realize:: he couldn't eat breading, he had to take breading off chicken and ummm Hhhh, he had a number of problems trying to get used to his new diet^ umm [V & T: Looking at W; | W smiling, T smiling, V looking at the screen: W doing circle motions: T looking at W, B looking like hard to stay up in chair. (having a good time with each other) [V: Nodding head yes (energy) |
| 11 | 140 141 142 | #11 [T: Yeah, it's like a helper- on -food -calibration -so -you -can -learn -from -thing | S writing...[V: Nodding yes – looking at T, W looking at T, R & D sitting back, B & S leaning in, Ned looking down |
| 12 | 143 144 | #12 [S: , “okay” | S: Leaning in and looking intently at screen |
| 13 | 145 146 147 148 149 150 151 152 153 154 155 | #13 Ned: Let me ask, what do you guys PAUSE what do you think of PAUSE, the idea ahh PAUSE of the wriststrap or tag, or could feel like a transdermal patch^; You guys perceive that PAUSE as umm, A reminder I have to take PAUSE for consciousness or possibly something PAUSE has some way to communicate to other devices? What are you guys thinking about that? | Students shift in their seats, looking at Ned; S using her upper half of body leaning towards Ned & looking at Ned; While Ned is asking questions, T tilts her head; V at first looking at Ned (sounds like under their breath saying ‘geez’) W sneezes—then reaches for her smart phone and shows the screen to T under the table; V, T, W looking at each other, smiling. |
| 14 | 156 157 158 159 | #14 T: To me it seems like, the wristband takes a backseat in the story. More about the website or service thing reaching out to her device... in the 1 st story like, like the ultra-fit ultra-enthused like probably cross-fitter in the military and his has this gear that is really advanced or | W shakes her head in affirmative T looking at W using her hands & makes a sweeping and V looking at W |

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| | 160 161 | whatever, but I don't know if it is always necessary in this situation it is really | S writing (at end of speaking T leans and looks towards Violet) |
| 15 | 162 163 164 165 166 167 168 169 170 171 172 173 174 | #15: W:]S The gear was cool[T: Yah-she already has her gear (hitting her hip)] W: so it talks to her gear, not something she has to wear]T: Yah (shaking her head yes)] V. Yah... (V nodding looking at W and then turns to camera) | W & T looking at one another mirroring upper body angles as each speaks; V in same angle repose as T looking at W with right arm tucked close to body, chin on right hand B,R, D looking disengaged, D looking towards R and S; S writing End of V,T,W interacting, R sitting up, all students focused on screen; S's head resting on folded hands in front of her mouth |
| 16 | 175 176 177 178 179 180 181 182 | #16: V: I'm wondering if with these flood of wristbands things on the market if PAUSE we try to steer the conversation less about the (inaudible) we can even acknowledge PAUSE that you can use an existing one, but it is more about how Distinctive captures the information and then displays it for people...W: so the acquisition of it...}T: Yah | W, T looking at V; W nodding head yes; V using her hands to explain it on the table with gestures ('showing options' – this/that) W & T looking at one another B nodding her head yes...B looking at S, S nodding her head yes |
| 17 | 183 184 185 186 187 | #17: Ned: Yeah, how it is captured and displayed PAUSE and how that's very personalized is something she isn't showing yet...that's my quick critique of what's next here[W & T, V talking over Ned saying YEAH...V emphatic shaking head yes[| V looking at Ned; W & T looking at each other Then V, T, W looking at Ned S writing; B & D looking at each other, R looking at Ned |

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| 18 | 188 189 190 191 192 | #18: B:]Another scenario you maybe could look at, maybe I don't know very much about it Vegan, like gluten-free trend? And I guess a lot of people who are on that don't get enough protein^, and I don't know enough about it\ people are into their health and personal sort of it is PAUSE personal, not maybe medical or not but would be interesting.+ | S, Ned, D looking at Bailey; R looking at Ned, W,T,V looking at screen |
| 19 Waffling Echo | 193 194 195 196 197 198 199 200 201 202 | #19: V: Another thing is technically, umm, that is we don't have to think about but something to know is, but technically if this were real we sort of have to make a decision if it is a consumer product or a medical product because right now a big issue with things like this actually happening in the real world is that the FDA regulations that you can't display life or death information on a consumer product because basically they're afraid your schzaam app would screw up your medical app and that would cause you to die..so umm this is something to have in the back of your mind... I don't think this should change anything (slide change—graphs, 'activity assessment', smart phones with apps, devices with numbers, labels) but real life constraint | V using the table to demonstrate with an outstretched arm on table and using a pen to point in one spot v. another spot. W looking at V, T looking down; all students looking at V, Ned writing; then W & T looking at each other S intently looking at screen, B |
| 20 21 | 203 204 205 206 207 208 209 210 211 212 213 214 215 216 | #20:]T: There was an article about Fitbit & stuff like that a while ago...so people are very very bad at judging their own behavior in terms of how far they've walked, how skinny they are...and getting excited about things like "trackers" – because people are believing it all like wholesale and they are not always perfect and so there is a whole opportunity for turning that information into meaningful knowledge (slide change) they're looking for that... #21: V: Yeah, I think it's always kinda of like, what you always hear about people will go on the treadmill it'll say they just burned 500 calories, but really because they weren't [T: moving their arms Hhhh] V: yeah, because they don't weigh that much they actually burned 200 calories, but they think they burned 500 and then they eat a Big Mac and that's really 750, but they don't know that...all that conversion gets people in 'trouble'... | V & W looking at T; S leaning in; B sipping soda V shaking her head yes V, T, W all looking at each other W looking and talking to V (inaudible), W nodding her head "yes" while V speaking the last line; T looking at W; then T, V, and W turn and look at the students; B smiling, Ned left the table (at 33.4) |

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| 22 Lots of waffling, missed words | 217 218 219 220 221 223 224 225 226 227 228 | #22: S: Very helpful...umm, I have some slides more focused on the design of it, (new slide-kinds of devices) but I don't know if I need to focus on that as much as umm getting my scenarios straight^ umm now but we talked about my infographics were not umm very personable^, I was very focused towards the medical and not focused umm on your everyday person we talked about sliders in the green or red zone, and maybe setting goals::: or something more that way, (new slide with flower, etc) but that is not as important now, and we had talked about avatars, not infographics, like a flower and I am feeling great today but the next day maybe I am under the weather so I am a little bit or I don't know maybe I'm like a cloud ...[B begins to interrupt | W, T, V smiling at S; S leaning way into the camera with half her body almost laying on table V nodding affirmatively on S's acknowledgment of her infographics not being personable T & V nodding affirmatively and Tulip leaning in when S addresses the flower avatar |
| 23 | 229 230 231 232 | #23: B:]Funny if you could choose what you wanted to be, like I could be like a flower and Rick could be like a.. [R:...like a bear] B: yeah, a bear students, T, W, V: Hhhh B: (inaudible) one day a bear...and out killing fish Hhhh R: or actually like...my life | W smiling looking at students D looking at B, smiling, S leaning in-over the table All the students looking at B |
| 24 | 233 234 235 236 237 238 239 240 | #24: T: I love this as sort of a way to priority, the idea you could take like sometimes I am a flower one day sometimes a dead flower and I feel like this but I want to feel like that and this has a memory of your failures and dates associated with those positive state and it could bypass all the numbers and be like say "you should really go for a walk, that helps you [V | T moving her hands side to side on 'like a flower' on one side of her body in front of her, to the other side of her body in front of her on 'dead flower' -T looking at V, and W looking at T B, S and Ned looking at the screen S nodding while T is speaking |
| 25 | 241 242 243 | #25 "...]V: so you're saying that the numbers are always available but if you don't want to get into the numbers you, can like, see that the flower is perking up? Or dying more or adjust | W, T looking at V while V is speaking |
| 26 | 244 245 | #26 [T: yeah, like with things in your life, like whitebread or go running ... | When T speaking, V nodding her head affirmatively |
| 27 | 246 247 | #27:]R: ...also that would work well with different types of users. I KNOW I am a numbers guy, so I would want to see a chart or a graph, | S re-showed two slides prior and then the avatar slide |

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| | 248 249 | but I know a lot of people who would like to see “is my flower perky or wilted?” B: so there’s an option there...that’s about it I was reviewing... | |
| 28 Trouble with advancing the slides | 250 251 252 253 254 | #28: S: That’s about it – kind of reviewing it ...(inaudible) environment...umm I think with tying Distinctive with all this too, and how the scenarios are really creating such a story, and I think with the avatars bringing the emotional side into it, which you guys have repeatedly said, I think umm better attracts... PAUSE | Each group looking at the other group V nodding her head |
| 29 | 255 256 257 258 | #29 JV: I think it’s really good progress. Think like Distinctive – Is this stuff shareable ? –would you ever want to send your flower to your Mom? ‘this is how I feel today’? Is there any way you could be connecting beyond the Dr. with stuff that is less data driven and more user | W looking at V; T looking down; D looking at B while all others looking at NR |
| 30 | 259 260 261 262 263 264 265 266 267 268 269 270 271 272 | #30 T: Can’t you imagine adding a third scenario that is sort like of like Violet in pursuit of a (inaudible) someone who is not necessarily medically driven’ not fitness driven, they don’t want to know the steps they’ve taken or their blood pressure going up but more like from a lot of work I’ve been doing recently that people are really concerned with maintaining their best mood, because it helps people being more productive and better relationships and just all around be happy and (inaudible) and that is so important and people are looking for a lot of ways to control their moods, whether it’s medication or “I freak out if I can’t go to yoga” or something, people’s feelings are really tied to their moods, like if it’s if you make a case that Distinctive is about people are in their best mood when giving something to someone else, if you could make it seem giving something like some joy, or whatever and it’s about you maintaining your best and that feels sort of like (inaudible):::what they do | T begins by looking at W when she begins speaking V at first looking down V nodding her head and looking at T T looking at W, and back and forth between S and the rest |
| 31 | 273 274 | #31: S: okay, Great. Helping people be their best^ | S writing notes, looking down V,W, T looking at students |
| 32 | 275 276 277 | #32: Ned: Violet was talking about whether you want your mother to know the color or the position of the flower...I remember the cultural shift living in Scotland you’d ask your co-workers how are they doing | Looking at screen (at 50) |

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| | 278 279 280 281 | and they say the 'same' and you have no clue for everyone gives the same answer no matter who you ask—"we're good", East Coast if you ask, they tell you v. the Midwest (inaudible) the niceness...! How much can you share with people? [talking over V and V talking over N] | |
| 33 | 282 283 284 285 | #33: V:] It would be Interesting data backup from FB/Social Media to see how much they talk about mood for it seems like it happens a lot S: thank you (Transition to Bailey's presentation) | V looking at W, then T&V looking at W; Ned S and R looking at each other |

Appendix T3

Transcript of April 27, 2012 Session – Interaction with Bailey

The April 27th Session was the last class session with C4 before their upcoming visit to Boston for their final presentation to Distinctive Greetings the following week on May 7th. Each person in the class was experiencing a bit of pressure to finalize their concept, their overall story and message and their visual presentation. This was a two-hour session and Bailey was the last to present. The questionnaires mentioned that both Bailey and Samantha's projects are not yet in shape for the Distinctive Greetings deadline.

This transcription system is a simplified and modified version adopted from Buttny & Jensen (2002) "Hot Stove League Talk" in Gary Gumpert and Susan J. Drucker (Eds.), *Take Me Out to the Ballgame: Communicating Baseball*. Cresskill, NJ: Hampton Press; 71-93. Reprinted with permission.

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| Word in bold | Word said with increased emphasis |
| PAUSE | Brief, untimed pause |
| () | Transcriptionist doubt |
| : | Extended or stretched sound, syllable or word |
| . | Falling vocal pitch |
| .+ | Voice trails off |
| ? | Rising vocal pitch |
| , | Continuing intonation with slight downward contour |
| ^ | Rising intonation |
| ∨ | Falling intonation |
| = | Latching of contiguous utterances |
| [] | Speech overlap |
| SILENCE | Longer silence than a brief, untimed pause |
| ~ | Audible out-breaths |
| Hhh | Possible laughter |

| Turn # + Tech Difficulty | Line Numbers | Language Content (The Said) | Other Communication (The Said in the Surround: Non-verbal, paralinguistic [voice tones, gestures], energy, pacing, silences, pauses, etc.) |
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| 1 30 sec of trying to get drawings up | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 | (began at 1:28: 32) B: Ummm, so I ummm My project is still very much in ‘sketch’ format~ \I/ So I re-listened to last week’s meeting and what you guys had to say again and went back to mindmapping more ideas, and liked what you had to say about having multiple little ideas? Instead of focusing on just like one scenario, which like last week was the car scenario, and sort of the star object? I would kinda have 4 ideas, maybe little ideas? and all sort of.+ and we have talked about maybe multiple times during in my presentations about how engaging and involving this thing is \I/ and I thought I would have maybe 4 ideas, little ideas and each would have like umm a step up on the level of engagement and the level involvement of the users? And so, with that; I am still kind of working out these final ideas.mmmWhen we sent the last package (prototypes 2 weeks ago) it’s the thumbs and that is what I was thinking is the lowest level of engagement, it’s the simplest idea? it’s a sort of like plain, like you air it and share it, it’s the thumbs, it gives you advice, it’s nice, whatever, you pick it up you’re waiting in line for a coffee, it’s sitting there you pick it up you read it and tear it and just give the other half to someone you know or not, anyone whatever, and that’s the lowest level of engagement and involvement? and the highest level? is would be sort of like the camera-printer that I mapped out last week. I would like to have sort of two in-between? and umm the one, flower one, I just have a flower there as a placeholder that’s the one I am little unsure like about, I still sort of have two ideas? I’m flopping between? and the calendar one? is | Violet and Tulip looking at the screen Violet leaves the room before Bailey starts presenting Dora’s playing with hair, Rick’s head in hand, tilted, Robinson looking at Bailey, Samantha focused on the screen. Bailey twirling her fingers Tulip leaning in towards screen Ned, Dora and Samantha looking down or at the center of the table; Rick looking at Bailey Bailey is gesturing with her left hand Tulip’s fist is over her mouth Violet comes back into the room Bailey moving her hands to mimic a flat page on the left and on the right |

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| | 28 | kinda like a share and tear but also like a What's Mad Libs, like | |
| | 29 | something you can share and tear but involves little more engagement | |
| | 30 | because you actually fill out, you have to write in a little more | |
| | 31 | information...like my idea for that is like, sort of an everyday calendar | |
| | 32 | you have on your desk like cats, or Quotes of the Day, you tear it off | |
| | 33 | every single day, but maybe in your moleskin notebook with week on | Tulip looking at her notebook, |
| | 34 | one side and lined paper one the right, and sort of like on the right | Violet fidgeting, shifting her |
| | 35 | "today is a good day because..." It prompted you to fill something | blouse, |
| | 36 | out...And so thinking about the horoscope poster I posted around the | |
| | 37 | Warehouse...like maybe a horoscope with a prompt, a different one | |
| | 38 | every day, and it prompts you to fill something out and tear it out, that | |
| | 39 | you can keep for yourself or give to someone, and that is sort of a mid | |
| | 40 | level engagement?^ Umm, and I think all of these ideas I will | Tulip looking to the right out the |
| | 41 | ^::storyboard out, PAUSE somewhat simplistically. | window |
| | 42 | | |
| | 43 | And for the flower idea ::nothing has to do with the flower, but I was | Tulip and Violet each with heads |
| Bailey starts | 44 | talking, I have two kind of separate ideas, and I'm not exactly sure | in their right hands |
| rolling the | 45 | which I want to use, or which one is better ...um one is sort of looking | Tulip writing in her notebook |
| slide | 46 | at the idea of business cards?AND UMMMMMMMM I guess sort of | |
| presentation | 47 | everyone has a business card and it has your contact information? as | |
| backwards | 48 | you meet somebody or friend somebody I guess sort of has () and as | Tulip with chin in both hands; |
| to the | 49 | you meet someone on FB or social media they get your contact info | Violet with chin in right hand |
| beginning: | 50 | and email address but they get so much more, your pictures, your | |
| Then rolling | 51 | timeline, like your tweets, hooked up to instantgrams so they see so | Tulip looking out the window |
| forward and | 52 | much else about you? kind of a way to reinvent the business card, like | Bailey turns and looks at Rick, |
| showing | 53 | a USB so you are giving them your information so much more about | speaking directly to him, then |
| mock-ups of | 54 | you...mmmm and my other idea..with having the ability to put your | back to the camera |
| each idea | 55 | stamp on something | Tulip and Violet each with chins |
| | 56 | | in right hand |
| Ability to | 57 | I found this girl who did a project and she made a little story book out | Tulip making notes, looking |
| see facial | 58 | with matches and each page written with invisible ink that lit up and | down, Violet looking at camera, |
| features | 59 | activated when a match was lit, looking at the idea of some type of | Tulip has chin in both hands |
| severely | 60 | sharing system but in invisible ink so you can leave your mark and you | |

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| <p>limited; can see general eye, nose, mouth places on faces of both C4 and Students, but not anything but the broadest of expressions</p> | <p>61 62 63</p> | <p>can put your stamp on it without harming it like, a building outside, or something but not that you are harming something with graffiti that is activated by ultraviolet light,</p> <p>Two very different ideas, but kind of like a step up of engagement and giving more than just a sticker to someone ...kind of...mmmm...not exactly sure I know which one I like more?^ Or which one is better?\\ (Bailey tapping the table...)</p> | <p>Bailey tilts her head and her look to the camera is quizzical, eyes wide</p> |
| <p>2</p> | <p>64 65 66 67 68 69 70</p> | <p>T: ummm...Maybe you should think about what's tying these all together? and what you are trying to do? with all of them because I think, it feels like it went like from anonymous, and sort of going to this thing where you need to be at arm's reach of someone to find something and (like a business card thing or your notebook...or an extension, or something)...And another thing is I think the storyboards won't really work, these are really doable and you should do them and then show them as opposed to showing the experience...</p> | <p>Tulip looking off to the right, out the window when she begins to speak, and then directly into the camera at "tying"</p> |
| <p>3 Clicking sounds</p> | <p>71 72 73 74 75 76 77 78 79 80 81</p> | <p>B:]Okay, for so like the thumbs up one I was definitely going to print things out for the presentation that I would have for everyone, ideally for how many people are coming, I would give a sort of party package/thumb's up sticker on everyone seat's so at least get some of these things they could play with them, the camera one I don't know how doable it is to create::but ummm</p> <p>I will show you how I was planning to storyboard so you can at least tell me if it makes sense or if it is not worth doing...For my presentation I was sort of going to present my original situation, the Ford truck, my broken arm and what prompted this 'acts of</p> | <p>Tulip nodding 'yes' with her head; Bailey using her hands to gesture...Violet with chin in right hand. Violet hand in her mouth. All the students and Professor Robinson looking at Bailey, Rick with hand on forehead.</p> <p>Tulip's hand goes to her mouth, big sigh, body caves in a little, starts to write</p> |

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| | 82 83 | kindness/generosity' and then go into the trends I originally corrected maybe pick one or two more hmmm, the SF postal thing, the coffee shop, like Starbucks and coffee, FB and instangram, then clearly state my goal and hummm brief...and my goal, my goal was to..sooo | |
| 4 | 84 85 | Violet]: Could you say your goal? | Violet sits up, leans it takes her pen and begins to interrupt |
| 5 Clicking sounds, intermittent in and out | 86 87 88 89 90 91 92 93 94 95 96 | Bailey: So yeah, umm, my initial goal was to umm PAUSE ahhh spread generosity, umm connect sort of strangers to each other, I don't know what exactly remember what I had originally written down specifically (looking through her papers) but it was to spread generosity, increase random acts of kindness and connect sort of strangers, or strangers in sense a community, or within a community, yeah, yeah, and ummm...PAUSE I think all of this was around it..umm andah.....ah.....focus around community though .+ | Tulip and Violet pens at the ready, looking down, writing as Bailey speaks, Bailey's head in hand, then gesturing Bailey looking at the table then at V &T, scratching her head: Tulip head resting on right fist Tulip, looking away – now to the left (towards Violet but not at her, just angled towards her) |
| 6 Tulip's voice intermittent throughout, like a | 97 98 99 100 101 102 103 104 105 106 107 | T: }...I, I, I keep...I keep thinking that you need to push these ideas further , like just when you said that it made me think of 'what if, each time somebody got, a really weird example, food to go, or they got wrapped up leftovers and the box said "why don't you give this food to someone else?", or something just... Something beyond paper and thoughts like congratulations –it takes it further PAUSE than this stuff ,....+ SILENCE B:]Wait, so you mean... | Violet's body angled and open towards Tulip, looking at her. Bailey, Samantha, Ned looking at the screen, Rick and Dora writing and looking down. Bailey rolling the screen back... Tulip opens her hands...gesturing... Looks at Violet, Violet nods Violet writing. Violet looking at Bailey Bailey looking kind of stunned, head off to the side |

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| mumbling | | | |
| 7 | 108 109 110 111 112 113 114 115 116 117 118 | R:]Like ...like...(hand outstretched) ...when you walk out of a Starbucks and I've got my coffee and my ahhh muffin (gesturing) and there's a homeless guy there, and I always have this odd reaction ^ I feel kind of a jerk, like why I don't just give these to you, I don't want to give you money but I would give you food and coffee whatever, but I just bought them and I want this ...but I definitely would want to do something... B: (Interrupting the last line of Rick's speaking with...) [Yeah....[Yeah...[Yup... | Rick reaches out hand towards Bailey, Bailey looking at him, all but Dora looking down. Tulip and Violet looking at each other and conversing, none from Levenger looking at them, they are only looking at each other, then V & T both look at Levenger students. Violet looking down, Tulip looking down to the right away from Violet |
| 8 4 objects of Bailey's up on the screen: camera + printer+ usb = Star frame. Tulip looking at screen | 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 | B: Well I definitely, like, imagining all of these to be, to sort of fit in to an already existing system? So this isn't something that's completely, you know, a whole new, idea but would latch onto something, like the calendar idea? Rather than create a whole new book of notebooks, notebook that would be your daily planner, rather team up with Moleskin and so they become part of something that already exists, is sort of how I imagined them all being... \I/ But umm, So, if I go back to how I was going to present it , after I state my goal, I would show two snippets of my experiment...and talk about the idea, that, you know, that each one had a different level of engagement \I/ and talk about how each one has ...varied, various levels of involvement? and what I was thinking for mapping out the systems?, not so much about the object? but is sort of like before I :explain: each example? last week in my scenario I | Violet writing, Tulip looking at her Blackberry or phone. Then Tulip looking at screen, Violet looking at screen. Pen in Violet's mouth. Rick and Dora fidgeting, looking at watch, scratching, ned looking at Bailey... Bailey gesturing with right hand Violet and Tulip looking at screen & Bailey: Tulip's learning her face into right hand and V with pen in her mouth; then writing Pen in Violet's mouth; Tulip looks out the window: Tulip's right side leaning into towards the camera, then tilts body far to the right, angled towards Violet, Violet, |

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| <p>B shows slide with object description = camera, printer, usb=</p> <p>New slide of a Ikea camera; then Bailey rolls back the slides to show the Object Description slide</p> | <p>137 138 139 140 141 142 143 144 145 146 147 148 149 150</p> | <p>presented I used the purple star as by object?, if I could sort of explain like explain what this purple star was –So the purple star is a camera, it’s a printer and maybe a usb –and it is represented as this ...purple star,...throughout the entire scenario: ? So when I map out the scenario, it isn’t about the particular design of the object, but I can just use this purple star...and this slide shows what the purple star is sooo thinking about using something like that for each scenario umm and then kind of mapping out how each object is shared through each scenario and how it goes forward...PAUSE I dunno if that works or not. And this sort of a camera that I found, and did what I sort of wanted it to do, given by Ikea</p> <p>SILENCE</p> <p>(ends at about 1:42:44/2:08:52)</p> | <p>right shoulder up, tilting to the left</p> <p>Violet and Tulip look at each other. They both turn back to the camera.</p> <p>Violet leaning in</p> |
| <p>9</p> | <p>151 152 153 154</p> | <p>V: I’m not really getting it B:]ummm</p> | <p>Violet leaning into the camera. All students and Professor Robinson looking at screen, Bailey’s shoulders hunched, chest caved, chin uplifted.</p> |
| <p>10</p> | <p>155 156 157</p> | <p>V: What, what is it?</p> | <p>Bailey raises it some more with V’s utterance, “what is it?” Tulip twiddling her hair on the back of</p> |

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| | 158 | | her head. |
| 11 | 159 160 161 162 163 164 165 166 167 168 169 170 171 | B: So last week when I had presented the scenario, it was the person who sees the car and takes a picture, they keep the picture and then they leave the object on the car... so the object is a camera, maybe a printer, and USB so you can take the images off of it so the first person takes a picture of the car and leaves the object then the second guy comes out and PAUSE...he sees an object on his car and maybe gets to take the images off of it because it is also a USB, sort of and he gets to take a picture and he keeps the picture of whatever he likes...which was the bike, and then PAUSE he leaves the object on the bike...so I am just saying that like this slide could be 'this is what I imagine the object could be and do and this is what I imagine it could function...but when I map the scenario out I am just sort of using this star as a place holder for what the actual object is, so not about the design of the object, it's about the system of how its shared... | Tulip tilts her head looking off towards Violet's direction Dora and Samantha looking at Violet and Tulip, Professor Robinson and Rick looking down at papers in front of them. Bailey wipes one side of her face Tulip looking out the window. Tulip looks at Violet. |
| 12 | 172 173 174 175 | V:] Is it like? an art project?...or T:] Who's paying for it? V: Yeah..(inaudible) who/what... Is it a campaign? | Tulip looking at Violet when she says, "who's paying for it?" Ned is writing, looking down. |
| 13 | 176 177 178 179 180 181 182 183 184 185 186 187 188 | B: Yeah, I was thinking about that and Distinctive was one of the people that was involved in the Red Campaign, and I was imagining it to be so yeah, I have a note about that and how it could be implemented...sort of and I imagine it to be a campaign similar to the Red Campaign so there's 4 different versions of that campaign and there are 4 scenarios I am creating and each one has a varying level of involvement, ummm Almost like the Willy Wonka the Chocolate Factory, the golden ticket, sort of like PAUSE there's 4 tickets out there whoever wins gets to be a part of this?...and like it makes it something exciting and makes it something like an event that goes on...I imagined it as sort of a campaign ummm and there are these different 4 levels of the campaign and I forgot to mention it...4 scenarios I am creating thinking...it would be an event that goes on... | Bailey - Hand gestures Violet and Tulip leaning towards camera...heads occasionally nodding yes. Tulip looks out the window, then head in hand, and then takes up a pencil. V & T nodding their heads yes; Students looking at Bailey. Tulip titling to the right. Violet fixes her hair and nods... Dora twirling her hair. |

| | | | |
|-----------|--|---|---|
| | 189 190 191 192 | Yes, I imagined it would be like a campaign and there is these 4 levels of a campaign...and Yeah, I (inaudible) and I forgot to mention that it would come after the varying levels of involvement...thinking...maybe it would fit right in? SILENCE | |
| 14 | 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 | T: I keep thinking about how into your umm your experiments you were in the Warehouse, and how like, basically, umm, like people don't behave well...and they don't follow directions or whatever? And ...wondering what is it if you did something opposite of Distinctive , like you made little nasty notes ...or stickers or something...that you could put on someone else's stuff ... it's just like ...I know it might be really upsetting and whatever, but , like, the idea of being like" I hope you stay you stay sick because I can take your desk, or your desk chair"[]Ned: I always knew this about you Tulip...]T: Something I really want to say, but I can't say this because I don't want to say this to your face... ...But But...okay I think the thing that is happening here is that you need something that is so like like, sort of not a wholistic system or like a larger idea – you need things that make people go like "UH!" (head in hand) and when you say something like you ...but what if it rains, and an ingrained resistance, good thing...could you go the exact opposite?! Enable those people that rip down posters...stuff like that? | Looking to the right out the window. Bailey's head tilted back, chin up smiling...Samantha, Dora & Ned looking down: Rick interested...then everyone looking at the screen. (Everyone smiling and laughing) Big grin on Bailey's face. Violet looking at Tulip smiling. LOUD Laughter. Tulip's hand over her heart. Violet got up and out of view from the camera for a second. Tulip acts out a person saying 'UH!' with head in hand body doing a sharp, playful drop in shoulders...Violet then laughed at Tulip, Tulip intently looking at Bailey and gesturing with open arms |
| 15 | 213 214 215 | B: Yeah. I think it would be funny,I think it would be interesting.... I don't if Distinctive::? would appreciate it...that much?(smiling) Ned: Hhhh | All the students and Ned smiling, Rick's chin in hand, Bailey leaning in towards the camera. |
| 16 | 216 217 218 | R: Distinctive's lack of ()...evil Distinctive [T: Yes]. B: evil Distinctive...yes! | Rick looking at camera and occasionally glancing at Bailey. Bailey angled to Rick and |

| | | | |
|----|---|---|--|
| | 219 220 221 222 | | laughing on ‘evil Distinctive’, being contained in herself as she repeats ‘evil Distinctive-yes!’ in a quiet way, looking at the camera. |
| 17 | 223 224 225 226 227 228 | V: ...If they are really I think Distinctive has suffered from being too (inaudible) too tea partyingly sweet for all these years and like there’s a new generation of people, and part of expressing yourself is actually saying what’s on your mind instead of pretending to like people...]T: it’s sort of like ...::Distinctive Greetings for Friends:: V:Hhhh, I mean, you could you know, you could make that statement | Tulip looking at Violet as Violet speaks to bailey. When Rose interrupts Violet, she is twirling her hair and leaning on her right elbow...looking at Violet as if they are the ones conversing. |
| 18 | 229 230 231 232 233 | B: Maybe it shouldn’t be so much about connecting with strangers, maybe it should be just like, could just be like () B: I mean it’s like random acts of kindness...oh, not so much, random acts of rudeness, weirdness...sort of really state your mind...and like random acts of truth | Violet and Tulip smiling and looking at each other—All of Levensger students looking at screen, smiling |
| 19 | 234 235 236 237 238 239 240 |]T: Random acts of truth I like, cause then they don’t have to be bad T: There’s something on FB called Odyssey Bots and they would slam books - put on page and people could write anything about them... sort of slam books or something, but people love that stuff...]B: Hhhh, Yeah | Tulip leaning in towards camera, gesturing, Violet looking at Tulip, Bailey looking at the screen smiling; Professor Robinson, Dora and Rick looking at the screen, Samantha looking down. Violet and Tulip looking at one another. |
| 20 | 241 242 243 244 245 246 247 248 249 |]R: If these bad situations are going to ...occur people like leaving natsy notes on cars...or]B: Like when someone parks really badly...taking up two spots...or some Larry David stuff “Curb your Enthusiasm” stuff]R: Distinctive comes in and their making a wild situation, where there is no social structure for, here is a nice way to say something ... () ...very politely...”While you were gone, I stole your chair while you were going and if you really need it back here is where you can find it”]Ned: Wow... | Rick and Bailey looking at each other and Rick gesturing as he says ‘no social structure’ and what follows. Violet and Tulip looking at each other with heads in hands. Ned looking down. Levensger students looking and engaged with each other |
| 21 | 250 251 | V: I mean you can do a whole story on how we’ve gone from June Cleaver to Cosby to Modern Family...the reason why that’s funny is | Smiling. Violet gesturing on table in front of her about the story line |

| | | | |
|-----------|--|--|--|
| | 252 253 254 255 256 257 258 | that they are human and they do mean things to each other, you know... T: And maybe you're going back to something said earlier about seeing the person on the street, that introverts would love, "I am deleting you from my FB feed and don't bother talking to me..." somewhere you are acknowledging those things that you see... T: You can come up with really awesome ones... | arc. Violet looking at Tulip laughing, smiling. Bailey talking and |
| 22 | 259 260 261 262 | B:[I really want to print something out and that people can give out throughout the day...around the office, and whether I leave them out...as we're toying around]T: I would like that | Bailey looking at corner of room, students looking at Bailey. |
| 23 | 263 264 265 266 267 268 269 270 271 272 273 274 |]V: It starts to make me think that at least ¾ presentations are in a lot of ways, will be a bit controversial to Distinctive? Rick saying you don't need to be close with your family and Samantha saying instead of spending all of your time building relationships with other people, learn to have a relationship with is yourself, and you saying you]T: Saying what you really mean]V: and we should be a bit controversial and be real, Distinctive; can be real and tell the truth...]B: Alright Ned: This is so funny because and I just kind of clipping about this...Bailey it is hard enough to present your designs but to assume the acting role of delivering this content with the right amount of evilness, and there's some acting involved too | All focused on Violet speaking. Bailey, Samantha, Ned and Dora smiling, Rick looking down. Tulip, head in right fist, leaning on elbow. Violet alternatively looking at the table and then the camera. Violet and Tulip laughing. |
| 24 | 275 | B: All right, I have some work to do, I'll pull myself together. | |
| 25 | 276 277 |]T: All of the tangibility, the in person stuff can still work... | All looking at the camera but Violet who is looking at Tulip; |
| 26 | 278 279 |]V: Once you sort of get this negative stuff off your mind you can actually build a relationship | Bailey smiling, Tulip leaning towards Violet. |
| 27 | 280 281 | T: There's all kind of stuff that you can find, like the "10 Habits of Annoying Coworkers"... | |
| 28 | 282 |]V: Or "Somecards", which is an e-card company called "Somecards" | Bailey writing |

| | | | |
|-----------------------|------------|---|--|
| | 283 | that are totally sarcastic | |
| 29 | 284 |]B: Yeah | Violet and Tulip looking at each other |
| 30 | 285 286 |]V: Overall, I am more attracted to the simpler solutions rather than the camera, printer, or USB...SILENCE | |
| 31 [Garble] | 287 288 | B trying to talk/T trying to talk | |
| 32 | 289 | B: Yeah, ok, cool, thanks. | |

Appendix CAS Dynamic Discussion

The Cognitive-Social Intersection: Findings One, Four, and Six –The Facilitative Value of Interruptive Critique, Figurative Language, Reframing and Ownership

Brainstorming and idea modification are the activities often commonly associated with creativity and creative breakthroughs, but in this study five other conversational conditions along with idea modification¹⁶⁴ facilitated creative breakthroughs. The review of this intersection will review the ways in which three of those conversational conditions (Findings One, Four, and Six) highlight the cognitive-social access into new meaning-making with language action and context.

The Essential Value of Interruptive Critique (Finding One) Finding One states participants had to interrupt familiar perspectives for creative breakthroughs to occur. Challenge and critique was most often done by C4 or by Ned Robinson in dialogue with C4. Violet mentioned in an interview that the critiques interrupted over-personalized stories and assumptions. The critiques also interrupted fixated attachments to possible design solutions (Bailey)¹⁶⁵, and expanded the world view of how to serve a client, and the client's customer (Samantha¹⁶⁶ and Bailey¹⁶⁷).

As was mentioned in the Summary of General Conversational Conditions in the Findings Chapter (p.__), the format for idea generation between the two groups was not optimum. The collaborative sessions between the students and C4 were in a present-critique-modify modality. Using such a modality might trigger a perform-for-an-audience reaction rather than a dialogic response. Students could also have anticipatory fear about the critiques they might receive. While critique is evaluative and could be interpreted or anticipated as non-collaborative or as a lid to idea generation, Herring, Jones and Bailey (2009) found critique as one of 19 idea generative techniques cited by 10 designers involved in product design process. Herring, et al., defined critique as the

...receiving input on current design ideas. This could be collaborative, such as receiving a design critique from a colleague or individuals critiquing their own ideas (either systematically or intrinsically). This technique often spurs new thought by finding solutions to design flaws within current concepts (Herring et al., 2009, p.5)

C4 seemed to not only use critique to give input of current design ideas, but to also intentionally interrupt the direction of the student designs. As the sessions analyzed were in the idea generation phase, I fully expected to see brainstorming between Levenson and C4. One of the advantages of brainstorming is for the apprehension of others' perspectives and ideas, upon which you can build, refine, and evolve. Perspective taking is described by Boland and Tenkasi (1995) as appreciative and energetic collaborative exchange, evaluation, and integration between diverse individuals of their distinctive knowledge within a

¹⁶⁴ The participants referred to any idea modification or generation as "brainstorming" although Osborn's conditions were not referenced, present, or used as guidelines for the ensuing conversations.

¹⁶⁵ See Appendix T3, turn 14/196,-200, 204-205, 207-212.

¹⁶⁶ See Appendix T2, turn 22/220-225; turn 28/250-254; turn 31/273. See also Appendix M2c, between turns 14-19 for contextual shifts which were reported through the interview and pinpointed by Samantha to occur at that point in the episode.

¹⁶⁷ See Appendix T3, turn 18/229-233, turn 20/243, turn 22/259-261 for the shift into implementation which shows how Bailey's design would be used for the client's customer.

community or organization (R.J. Boland Jr & Tenkasi, 1995). Yet, in each of the vignettes, critique with perspective taking and making, rather than brainstorming, was the primary spur to new thought.

As the students presented their design concepts, they did so narratively, with design scenarios constructed to tell the story of solving their design problem. In each instance, C4 used critique to interrupt the design scenarios the students were telling. In the Dora and Bailey vignettes, the scenarios were confusing and limited the design. CMM analysis revealed the contextual resources and perspectives the students' were drawing upon that might make the scenarios confusing, such as the context of present-and-perform-for-an-audience in Dora's case, or 'professors should help stuck students' in Bailey's case. Critique had to be interruptive of those contexts as well as the design story and concept so as to provoke greater perspective taking and making. This seems related to Cronen et al's (1979) findings about unwanted repetitive patterns, Giddens' structuration theory (1976), and Bruner's (1986,1990) theory that the storying of experience also constructs and reinforces the self-world.

In his interdisciplinary, design-domain independent review article of the empirical studies of design activity and cognition, Cross (2001) noted the solution-focused nature of designers seemed well-suited for the ill-defined problems designers' encounter, which is relevant to the Distinctive Greetings Project in general, and the Bailey episode in the particular. Rather than make a large cognitive investment in constructing a design problem in well-defined ways, designers would rather take a design brief as the context, and formulate problems within it, and use solution conjectures or hunches so as to co-evolve the solution and the problem together as a way to focus the solution (Cross, 2001, pp.4-5). This seemed to be the tack Bailey had taken, but by the time of this episode, the design problem had not evolved, leaving her possible four design solutions rudderless.

Cross also cited several studies that discuss that the solution focus approach could have several drawbacks due to fixation (Jansson and Smith, 1991; Purcell and Gero, 1991, 1993; Purcell and Williams et al., 1996 as cited in Cross, 2001, pp.6-7) attachment to early solution ideas and concepts, and opportunism to stick with what sounds plausible. Attachment is one form of fixation, and fixation blocks a designer's ability to consider other knowledge and experience that could be brought on a problem (Cross, 2001, pp.6-7). It may have been that fixation and attachment were drawbacks that had to be interrupted for Bailey's breakthrough. CMM analysis and later sense-making interviews revealed that this unwanted pattern of tension was a result of mismatched contextual resources and deontic logics between them, which could partially account for the fixation and attachment¹⁶⁸.

What finally began to interrupt Bailey's attachment and fixated deontic logics and precipitated Bailey's shift to consider something else began with Tulip's interruptive use of analogy and metaphor in her critique/suggestion in Turn 14, when Tulip enacted a possible scenario for Bailey,

¹⁶⁸Bailey wanted C4's help for a presentation the following week to Distinctive Greetings in Boston, as she said in the interview: "I think there was that pressure, I have to make this final presentation very soon. I have pieces...I was behind on everything...I was willing to talk about what the specific things were, but I wanted to say, look, can I present it like this? And then go into detail about what this is...that's where the frustration was coming probably coming from" (Bailey). Both C4 and Bailey might have also been fixated on finding how to make sense of Bailey's design concept by using what was already familiar and good enough, from their separate, and disparate perspectives. Likewise, the temporal dimension could *add* to the pressure and deontic logics and contextual mismatch, rather than obviate it.

‘I hope you stay sick because I can take your desk or your desk chair’...you need things that make people go “UH!” (head in hand) and when you say something like you...could you go the exact opposite?! Enable those people that rip down posters...stuff like that? (Tulip, Turn 14)

Participants had liberally used figurative language, such as Tulip’s use cited above, to indirectly intervene in the tension/deontic logics present¹⁶⁹.

Figurative language intervention would help the student presenters and the entire group to see things anew, allow for the taking on of other perspectives (or other elements of the critique), and create new scenarios for their design stories and concepts. After Tulip made this interruptive critique to Bailey, the logics of the interaction shifted to an implicative/contextual force pattern, with all participants freer to access a multiplicity of contexts and meaning-making¹⁷⁰. This pattern was evident in each vignette, including Samantha’s although I will not be citing examples (see Appendices M2a-M2c of the Full Conversational Maps). A pattern of implicative/practical force logics indicated more of a future and action-oriented focus.

The advantages of using figurative language (e.g., analogy, metaphor, etc.) for creativity stimulation is well-documented, both in design situations as well as in social interaction (Bonnardel, 1999, 2000; Casakin, 2011, 2012; Gammelgaard, 1998; Hey, Linsey, Agogino, & Wood, 2008). Likewise, the benefits of figurative language socially have also been noted by organizational scholars. The successful interruptive and interventive power of generative metaphor for positively shifting negative social group dynamics is consistent with the literature of organization change research (F.J. Barrett & Cooperrider, 1990; Sackmann, 1989; Srivastva & Barrett, 1988).

The Co-Evolution of the Design Story and Design Concept (Finding Four) Not only was critique posed with figurative language positively interruptive and important for opening the door for new thought and meaning-making, but it also had a bridging value for the co-evolution of the design story and the design concept. Bridging could be defined as the making connections and associations from one mental framework to another. In the Bailey and Dora vignettes, the bridging value of figurative language critique was immediately evident by presenting students’ affective, physical responses as their bodies shifted, their facial expression seemed to grow more open and curious, and Dora’s voice tonality also softened and warmed.

Bridging was also in evidence with the other students. In the Bailey vignette, Tulip’s first attempt at an analogical critique in did not resonate with Bailey at first, but it did with Rick, who warmed to Tulip’s analogy of packaging leftovers in restaurant boxes that were printed with ‘why don’t you give this food to someone else?’ He immediately responded with an associative extension and a scenario of that idea being enacted at Starbucks in the next turn (Turn Seven).

Tulip and Rick had taken Bailey’s initial core concept of random social interaction for some good purpose and had built from it. However, their builds were insufficient to interrupt

¹⁶⁹ See Appendix T1, turn 11/126-134 for Dora, Appendix T2, all of turns three, nine, 11, 14/156,23/229-232,24/233-23730/266-270, 32/275-276 for Samantha, and Appendix T3, turns 7/108-111, turn 13/181-185, turn 14/198-200, 210-212, turn 16/216-218, turn 17/223-225, turn 19/234, turn 20/243-248, turn 21/254-257 for Bailey.

¹⁷⁰ See Appendix M2a, turns 14-19.

Bailey's driving focus (part of the prefigurative/contextual force pattern) on how to structure the middle part of her presentation. Yet, Tulip used a figurative language critique (analogical metaphor) that successfully intervened and bridged several connections when she said,

I keep thinking about how your experiments were in the Warehouse, and how like, basically, people don't behave well, and they don't follow directions or whatever. And wondering what is it if you did something opposite of Distinctive Greetings, like you made little nasty notes, or stickers or something, that you could put on someone else's stuff...it's just like, I know it might be really upsetting and whatever, but, like the idea of being like 'I hope you stay sick because I can take your desk, or your desk chair' (Tulip, Turn 14)

This comment made three associative connections that enriched Bailey's several narratives: One to Bailey's core concept of random social interaction, one that acknowledged Bailey's creativity from her experiment earlier in the semester, and indirectly, that recognized an expression of Bailey's personality that liked to break the normative social rules herself¹⁷¹.

Multi-layered meaning-making may be hidden beneath the explicit language or actions taken in any interaction, making potentially creative moment unobvious to observers. Potentially creative moments are not always immediately obvious to observers of interactions. This could make the potential for breakthrough alternative meanings not immediately discernible, as the analysis of interaction between Dora and Violet in the Dora vignette and Samantha's creative activity while Professor Robinson and C4 are in interaction in the Samantha vignette reveal.

In Turn 11 in the Dora interaction, Violet connected a metaphorical story of an unknown client group she had just met while on business travel¹⁷². She noticed the client group had used conversation about the weather as something she and they could relate to when introduced to open the relationship. She offered that as a parallel metaphor to Dora's design concept. Dora warmly responded to Violet's metaphor, validating it and more unguardedly shared her perspective as if she had achieved permission to more fully develop her design story and concept. In that moment, Dora could distinguish between the meta-story she may have been building about the lack of connection between herself and Violet (discernible by conversational analysis and CMM LUUUUTT analysis in Turns two through seven), and use this interchange's mini-story to realize that Violet and she *were* connected in what mattered most, that her design could work.

Bruner (1986) suggests that metaphor is a nascent gesture that invites alternative pathways, and the data from this study indicates that figurative language use more generally has the same effect. Figurative language in the forms of analogy and metaphor were liberally used in the three patterns of mutual builds and critique in the Samantha episode too¹⁷³. Samantha said that while watching the Robinson/C4 interaction she made connections from what C4 had said earlier in the episode and realized the design story and the client's experience was most important. While this is another example of seemingly innocuous conversation concealing a great deal of meaning-making underneath the surface, it also is an

¹⁷¹ Bailey acknowledged this in a later interview.

¹⁷² See Appendix T1, turn 11/125-132.

¹⁷³ Figurative language is marked in pink and green on the Samantha vignette CMM complex conversational map, Appendix M2c.

example of the powerful presence of generous listening¹⁷⁴ and how that associative capacity facilitated the shifting of contexts and the creation of new ones, an indication of creative breakthrough emergence. While closely contiguous, Barrett's conception of generous listening is more an act of clearing the way for another's brilliance to come forth, and Sawyer's creative listening concept is more of adding to or building from another's expression. From the text or videotape observations, we do not see Samantha having the breakthrough at this point, as she does not speak or use her body to indicate one is going on. What could be inferred is that she was engaged as she wrote notes through the Robinson/C4 interaction. As Samantha said later in an interview where she was asked if she had a breakthrough during this vignette, she pointed to this interaction,

I definitely think that when Tulip [said] the kind of wristband isn't as important that was something that directly led to my final presentation. Yeah, so I definitely took that...if she didn't say that, I would probably still be trying to explain it...where she was like, you know 'what is more important in this whole scenario is not really specifically how a worn piece of technology works. (Samantha)

And she noted a greater possibility,

...it was more important that they [C4] understood it and were relating to it and kind of pushing me in another direction, and that this could really relate to an audience more than it making sense to you [herself, as a student, or to pleasing C4]...more of this could be possible, specifically to the actual customers. (Samantha)

This latter comment from Samantha indicated that she shifted her meaning-making context from a focus on device details and 'getting it right' to a focus on the client's actual customers while witnessing the Professor Robinson/C4 interaction¹⁷⁵.

From the first critique about the design story that C4 offered to Samantha as well as C4's critiquing and building upon ideas with each other about Samantha's design story, Samantha made three contextual shifts¹⁷⁶. As the interview confirmed, her design story and concept evolved with the two contextual shifts she made from a focus on her own sense making about details in her design to what would make sense for the customer (as happened while witnessing Ned Robinson and C4), to finally a conceptual shift she makes to the experience of her client (Distinctive Greetings) and how they might want to support their

¹⁷⁴ Frank Barrett (2012) describes generous listening as attentive attunement to another's expression, with an "...unselfish openness to what the other is offering and a willingness to help others be as brilliant as possible (F. J. Barrett, 2012). Generous listening does not preclude a critical discernment, for a generous listener, in Barrett's reference to a jazz musician, has to listen for the future possibilities of where the other could be heading and support those for the sake of the other person. Therefore, generous listening is making the other's contributions shine more brightly than one's own. Coincidentally, I have used this term, with these meanings in my organizational change practice since 1999, without knowing of Barrett's work.

¹⁷⁵ I refer the reader to the Samantha vignette in the CMM simple conversational map, Appendix M1c, to note the contextual shifts of the student side of the hierarchy of contexts (left side) between the sub-episode that contains turns 3-12 and the following sub-episode that contains turns 13-17 for a more complete view of the contextual shifts pattern.

¹⁷⁶ These were made observable by analyzing the text with data from the interviews with the CMM heuristic of the hierarchy of contexts and traceable with the coordinated action sequences in Appendix M1c; present the best I can so they understand it; I know it's disjointed was her highest level of context between turns 1-12, then from turns 13-21 it shifted to my design needs to work for Distinctive's customers, and from turn 22-33 it shifted to I changed my design's focus and design problem.

customer (in the following discussion) in Turn 31 when she said “Helping people be their best” (Samantha). Retrospective sense-making interviews and the CMM theoretical analysis of the contextual and language coordination’s revealed that the creative breakthroughs were happening beneath the surface in these three episodes.

The Value and Importance of Reframing and Ownership (Finding Six) C4 were revered and regarded for their innovation track-record and vast social and professional networks as design professionals by the students. The less socially and professionally established students’ negotiation of their ownership of the evolving design stories and designs therefore may have been more challenging than if the participants had been co-equal in expertise or experience. The students had to find ways to make the perspectives, critiques, and mutual builds received from C4 their own to deliver a believable product design presentation for Distinctive Greetings.

From a CMM communication perspective, the students made the critiques their own through a double process of re-interpretation that CMM analysis made observable by the serpentine heuristic and the concomitant contextual heuristics that showed a shift in the contexts in-use (e.g., logical force patterns and the hierarchy of contexts changed). First, the student would need to understand the critique, and begin to try on how to incorporate it as part of her design story. As Samantha’s and Bailey’s example above illustrate, the taking on of C4’s perspective, and making sense of it did not happen immediately after it was first offered. The student had to *choose* to take it on, which was the first part of the double re-interpretation process. These choice points were noted in each vignette as bifurcation points and were fateful for the emergence of the creative breakthroughs as well as for the ultimate design product concept for this first choice sent the design in another direction¹⁷⁷.

The second part of the re-interpretation process was also a choice, a choice to relate to her design differently and reframe the story and the concept. The emergence of this was most starkly evident in the Bailey episode when she said in Turn 18,

Maybe it shouldn’t be so much about connecting with strangers, maybe it should be just like, could just be like, I mean, it’s like random acts of kindness...oh, not so much, random acts of rudeness, weirdness...sort of really state your mind ...and like random acts of truth. (Bailey, Turn 18)

In this reframing statement, Bailey owns her incorporation of the critique. Her design story became random acts of truth. Bailey’s naming of her project as random acts of truth, like Samantha’s reframe and naming of her design concept as helping people be their best (above) signaled the end of the design product conceptualization. As each student did incorporate and reframe the critiques and re-story her narrative about the potential of her design concept for Distinctive Greetings, she also re-storied herself for as the narrator, she was autonomous, and in charge of what was important to the design, as well as the story, and was shaping the future potential with her product for Distinctive Greetings. As Pearce (2007) and others have pointed out, the simultaneous story-ing of experience reflexively can create the self, and in these cases, the reframing helped to expand the students’ professional selves (W. B. Pearce, 2007).

Summary Conclusion of the Cognitive-Social Intersection The cognitive-social aspects of creative breakthrough generation were evident in the delivery and incorporation process of critique, the co-evolution of the design story and concept, and the ownership

¹⁷⁷ Please see Appendices M2a-c for the bifurcation point pattern on the complex conversational maps of each vignette.

expression of the transfigured critique. As the above discussion and examples show, critique and discussion were amongst the primary features for new idea generation as they facilitated new perspective taking and making with co-participants that may have limited breadth of experience. Critique posed with figurative language had a simultaneous interruptive and broadening value.

Figurative language use also led to creative breakthroughs, for it invited nascent pathways for multi-meaning creation and facilitated associative bridging for the building of new narratives. Patterns of contextual shifts accompanied multi-meaning creation and could be discerned by energetic and verbal responses or later reflections, even if the response came from an unintended group participant. Creative moments were not always immediately obvious, for multi-layered contexts and meaning happened beneath the surface of explicit language, facilitated by figurative language use and generous listening.

A new concept became more ready for implementation and further manifestation after a double-interpretation process where the author of the design concept would take and try-on another perspective (or critique), and then make it her own by reframing and naming the concept with her own logics and in her own words.

The Social-Affective Intersection: Findings Two, Three, and Five – The Facilitative Value of Relational and Responsibility Moves to Letting Go and the Additive Effects of Group Modification and Ideation

Part of the perceptual process in collaborative communication involves a social-affective dynamic, as noted by some creative collaboration scholars (Sawyer, 1999; Seddon, 2004, 2005), and organization theory scholars (F. J. Barrett, 1998) in their discussion of how finely attuned jazz musicians were to one another and would know when and how to defer and showcase another's solo during improvisation. Emotional dimensions are often communicated para-linguistically as well as directly in the course of regular social interaction, and are an important source of information for all parties in a communicative interchange. Emotions are also such an integral part of social interaction that the understanding of what is effective communication includes the context appropriate sending, interpretation and experiencing of social-emotional cues¹⁷⁸ (Halberstadt et al., 2001).

The affective-social aspects of the specific conversational conditions of the study were highlighted by Findings Two, Three, and part of Finding Five. Relational and responsibility speech acts made by students towards C4, and by C4 towards the students helped to change pre-figurative/contextual deontic logics patterns¹⁷⁹ as well as facilitated the making of new meaning. Even though attempts are made to hide or suppress both positive and negative emotions in professional settings, emotions often leak through on one's face,

¹⁷⁸ Amy Halberstadt, Susanne Denham and Julie Dunsmore's (2001) excellent theoretical overview of the dynamic processes that underlie social-affective competence. They emphasize that affective-social competence is an integrated dynamic core to interactions, and is comprised of three components; sending, receiving, and experiencing context appropriate messages. Affective-social competence is distinguished from emotional competence because the eight skills of emotional competence that Saarni's research found (1990, 1997, 1999) more emphasize experiencing, and lean towards an intra-psyche rather than a social experience. Affective-social competence is different from social competence in that social competence emphasizes social skills, peer status, relationship success, and functional goal-outcomes (Rose-Krasnor, 1997), and ignore the relational and intra-psyche dimensions (Halberstadt et al., 2001, pp.80-88).

¹⁷⁹ Please see the CMM complex conversational maps Appendixes M2a for Bailey, between sub-episode two (turns 4-13) and sub-episode three (turns 14-18); and M2b for Dora, between sub-episodes two (turns 3-7) and sub-episode three (turns 8-11), also in Table 11 in Chapter Four, p160.

tone of voice or speech pacing. Both groups reported that these social-emotional cues were often hard to detect for both groups over the ‘divide’ of Adobe Connect¹⁸⁰. Possibly because it was difficult to read the social-emotional cues, the emotions that did come across the internet connection from the participants’ relational and responsibility moves stood out more, and therefore had more influence in that the course of action changed soon afterwards.

The affective responses of either the presenter or the audience could influence the course of action, as will be highlighted below. The instances of affect influencing action, as well as action influencing affect in this study were consistent with Amabile, Barsade, Mueller and Staw’s (2005) findings where positive affect supported creativity in organizational contexts and was an antecedent to creative thought as well as integral to the creative process (Amabile et al., 2005). Practically every participant reported in her/his final interview that the entire Distinctive Greetings Project would have been improved dramatically had they physically met in person and had a chance to develop some relationship and situational context about who they were dialoguing with at the outset of the semester instead of only at the end.

Relational Moves Facilitated Letting Go (Finding Two) To interactively make new meaning, a new opening has to be created so as to appraise prior conceptualizations and consider other perspectives. Often, emotions are tied to action (Flaherty, 2005), and in a reflexive dynamic. Positive affect actions provoke more positive actions and reverberating self-effects in others (Amabile et al., 2005). When C4 shifted gears from delivering critique without appreciation and affirmation to delivering critique with it, new meaning-making became more possible in two ways, one expressed particularly, and the other from a generalized contrast. First, appreciative moves facilitated students to either let go or loosen the grip of previous and familiar conceptualizations or approaches so suggestions from C4 were more fully considered¹⁸¹. Affirmation of the students’ work also invited the participating students (not just the presenters) into a more expansive and deeper world-view of the client dilemma¹⁸². The second way relational moves helped participants let go of preconceived notions was the contrastive function of acknowledgment and positive affect against a backdrop of generalized, anticipatory angst about design sessions with C4 that the students reported¹⁸³. I begin and end this section with the more particularized examples of how the affective-social dynamic aided participants to let go, and address the contrastive function of positive affect in the middle.

Tensions and mutual expectations of what each other ‘should do’ characterized the C4-presenter dynamics in the first halves of both the Dora and Bailey episodes. These

¹⁸⁰ Both groups used these words to describe the conference tool experience of working together, ‘the divide’.

¹⁸¹ Evident in the Dora and Bailey interactions, and explained earlier in the Finding Chapter.

¹⁸² Most noticeable in the Samantha and Bailey interactions, see turns 16, 19, 21, 24, 25, and 29 of the CA transcript of Samantha’s vignette, Appendix T2; and turns 17, 23, and 26 in the Bailey CA transcript, Appendix T3.

¹⁸³ When reviewing the transcript of her session (Appendix T2), Samantha said “I presented well for being so nervous, so that’s surprising” (Samantha) and Dora expressed her apprehensiveness about the C4 sessions when she said, “it felt like the focus was on this bridge between us. So from C4, the energy or the expectations was very large to me. Like a lot of pressure from them...I just felt pressure to perform a certain way and would be more comfortable to do so it that bridge between us was clearer” (Dora). Rick said that Bailey “was always [in]this dichotomy with the way that she presented ; outside of class [with C4] she’d worry a lot like oh is this the right thing to do?...but once she presented to the C4 people she always presented it as this was the positive progress like she had it under control and was happy and excited about it, so I think there were two sides of her presentation.” (Rick).

tensions blocked new meaning-making as well as effective action¹⁸⁴. When relational moves were made, participants would simultaneously let go of preconceived notions and open themselves to consider a design situation, critique, story, or concept from other perspectives.

In the Dora episode there are two instances of acknowledging and affirming relational moves that made a difference for Dora's ability to let go of how she was telling the design story and make a connection to C4's perspective¹⁸⁵. She then took on their perspective to alter and improve her design story and concept. Once in turn nine when Tulip responded to Dora's offer with an acknowledgment, "That might be nice and your drawings are really nice and it feels like there is something there..."(Tulip, turn nine). Dora experienced more connection. The connection became more definitive with Violet's admission that she had missed a lot of Dora's story development due to business travel in turn 11, ending with the confirmation Dora needed to trust her design logic and appropriately distill and tell the story. Here is how Violet framed it,

Maybe it is because I have missed a lot of the background of this, but what would help me to better understand... [metaphorical story of the weather, described above]
 Maybe what you are saying is that the things you surround yourself with say a lot about who you are, so it is important for the other person to see that, and important for people to talk about tangible things. So they begin to have a dialogue, or am I just, making that up? (Violet, turn 11)

Dora's face relaxed and her voice tonality lightened and almost was lilting when she said, "No, that is right on..."¹⁸⁶ and goes on to explain the various aspects of how her design could help heal this long-distance and wide-age disparity difficulty between separated family members. In addition, she experienced Violet's outreach which also communicated Violet's concern and desire to connect. From the interview data and CMM analysis, it was at that moment Dora could experience C4's efforts to create a richer background of relatedness with her. This experience then caused her to let go of some negative emotions or perceptions of the quality of attention she had observed by C4. This was a case of positive affect moves changing the creative course and confirmed Amabile et al.'s (2005) findings. The contrastive function of relational, affirmative moves against a backdrop of generalized angst will be discussed next.

The generalized angst the students noticed¹⁸⁷ about their sessions with C4 could be attributable to several factors: timing, leadership role unclarity, the internet interface of Adobe Connect, self-criticism and disappointment with the quality of the designs, or the frequency and intensity of presentations and feedback with C4. The present-critique-modify modality of student presentation over the Adobe Connect interface most resembled studio design critique¹⁸⁸ where an individual student will either display their designs on a wall or

¹⁸⁴ See the Summary Table of the Analysis for Creative Breakthrough in Chapter 4 (Table 11), Bailey vignette column, sub-episode 2/turns 4-13, and the CMM complex conversational map of those turns to see the dynamic, Appendix M2a.

¹⁸⁵ See Appendix T1, turn nine/111-113 and turn eleven/123-125, 128-133.

¹⁸⁶ See Appendix T1, turn 12/140-141.

¹⁸⁷ Not each student reported feeling angst personally, but all noted the intermittent presence of that mood in the course of the semester, and most pointedly in April while readying for the Distinctive Greetings Presentation scheduled for the first week in May.

¹⁸⁸ No matter which design discipline, such as architecture, industrial product design, fashion, communication, or other design disciplines, Schrand and Eliason (2012) assert that the procedure for design critique is commonly shared (Schrand & Eliason, 2012, p. 51).

hand around a prototype model of their work in a larger group setting with interested faculty, professionals, and invited guests in attendance. Then the student will explain their work, receive feedback, and respond to challenges and comments from the audience (Schrand & Eliason, 2012). While the students in this study had experienced studio design critiques previously, they were not accustomed to studio design critiques on a weekly basis.

The students also received critiques and guidance from Professor Robinson and each other in another weekly session, not recorded or reviewed by this researcher. Students reported that in those sessions Robinson either played a teacher role or coached the students and was most facilitative of creative breakthroughs not observed by the researcher. Yet, it was the sessions with C4 that several students reported to be the most emotionally troubling.

Schrand and Eliason (2012) investigated whether design critiques had an emotional dimension that interfered with students learning (Schrand & Eliason, 2012) in a year-long quantitative and qualitative study of 373 students from 10 different design fields. They found that design critiques (publicly-held) had the lowest level of comfort; while desk critiques (privately-held) had the highest level of perceived comfort. Written responses indicated that it was not the fear of criticism that made the design critiques the least comfortable, *but the level of comfort the student had with his or her own performance or the project itself*. Desk critiques were also perceived to be the most helpful of the five critique methods, with final critiques ranked second. The negative emotions that accompany final critiques, however, were perceived to be the most interfering to learning. Post (2012) found that psychological safety links connective thinking with increased cooperative learning to help improve group innovation.

Just from the structure of the collaborative sessions between C4 and the Levenson students presented a hurdle as each session was like a final design critique and the students reported negative emotions in presenting ideas due to their inability to read the affective-social cues easily through the Adobe Connect interface. This contributed to their reported difficulty in receiving C4's feedback also (e.g., not interested in the direction of the feedback, awkward silences and confusion, anxiety and migraines about communicating my ideas properly, flooded with ideas and not able to express them as the right moment passes by, unclear expectations, and overwhelm in the digestion of all of the suggestions given while trying to listen to one's own voice simultaneously¹⁸⁹).

Therefore, when any positive affective moves were made, by C4 towards the students, C4 towards each other, or by students towards each other, the anticipatory angst was interrupted and a more positive tone was set and helped the connecting, which in turn helped the letting go. The creative process might typically include near misses, blank spaces, and going to imaginative or associative places previously unknown, and therefore lonely and uncomfortable. It is not easy to continue to hold the gap between 'not good enough yet' and again generate a better evolution of the design. Bailey was painfully confronted with that gap during her episode and reported feeling so confused and not connecting to what C4 was saying. Connection is essential to the creation of new meaning, for 'connecting to an idea' is also connecting to aspects of *someone's idea* from some time frame. Perhaps not in the

¹⁸⁹ Data collected from the anonymous questionnaires in the month of April, 2012.

current timeframe, or in the situation, but in some time frame and from memory of a situation that was socially-affective in nature¹⁹⁰.

Letting go might begin with generous listening. When Tulip acknowledged Bailey and her previous Warehouse experiments in a warm voice with connective moves in turn 14, perhaps she was attuned to deeper motivations than Bailey could express in that moment, but had before. Tulip's attuned listening of Bailey then retuned Bailey's. Bailey said she could then start to hear what Tulip had been saying to her. This is consistent with Creede's (2008) theorized relationally generative interactions and relational eloquence, where the co-participants draw on shared resources, specifically in the form of accessing aspiring stories of the other, and open possibilities for all in the interaction (Creede, 2008)¹⁹¹. The group's appreciation for Tulip's further suggestion that Bailey go opposite from Distinctive Greetings in Turn 14 was marked by a lot of smiling, laughing, joking around and head-nodding amongst all of the participants, which helped Bailey let go of her confusion. In addition to the other elements, the mood change, the level of listening engagement, and the positive response of the group in Turn 14 helped Bailey let go of her adherence to the four little ideas¹⁹² she had for her presentation at the outset of her interaction and begin to try on the critiques and the suggestion made by Tulip.

The Value of Taking Responsibility and Choice (Finding Three) In addition to the positive relational moves that aided participants in letting go as discussed above, negative emotion, discomfort, or constraint experience supported the participants to perceive and make choices that initiated new, and better action. At three points of uncomfortable awareness, participants saw that to continue to act in the same manner they had been would not advance their projects and chose a different direction; 1) when Dora recognized the trouble Tulip had understanding her presentation¹⁹³; 2) when Tulip recognized that her critiques and indirect questions were not having the intended effect with Bailey¹⁹⁴; and 3) when Samantha listened to the testy interaction between Professor Robinson and C4 midway in her episode¹⁹⁵.

From later sense-making interviews, each person made a choice to change her action, and that in turn, altered the direction of action and meaning-making between the co-participants for the emergence of creative breakthroughs¹⁹⁶. Pearce (2007) calls these choice points bifurcation points to indicate the fateful opportunity they are to chart the course of future action. Pearce (2007) is careful to admonish that not all bifurcation points indicate wise choices, or positive, satisfying outcomes for the parties involved, for the relational interaction is emergent and dependent upon both parties. Also, not all bifurcation points

¹⁹⁰ John-Steiner (2000) tells the story of Einstein and his long-standing friendship and collaboration with mathematician Marcel Grossmann and how he credited Grossmann for the essential help he need with mathematical equations given those were not Einstein's strength.

¹⁹¹ Tulip's seemingly deliberate reminder to Bailey of her former creative experiments during the semester is the best example of using relational eloquence, when she elicits and reinforces Bailey at her best, with Bailey and the group in the interaction.

¹⁹² Bailey's words, see turn /12 in the CA transcript, Appendix T3.

¹⁹³ See Appendix T1, turn seven/100 and turn eight/108-110.

¹⁹⁴ Tulip's recognition that she was not succeeding with Bailey made have happened before turn 14, for instance in turn 13 or previously, but we see the evidence of different action by Tulip in turn 14/192-196, see Appendix T3.

¹⁹⁵ See Appendix T2, turns 13-17.

¹⁹⁶ See the bifurcation point patterns in Appendices M2a-c; Bailey's between turns 14-19, Dora's between turns 6-11, and Samantha's from turns 13-22.

reflect intentionality for a result, nor awareness or mindfulness in relational responsibility, but the following choices did result in both relational responsibility¹⁹⁷ and creative breakthroughs.

Demonstrations of relational responsibility include an ability to hold the dissonance of an interaction when the interaction has become too monologic, and the ability to re-center the conversation back into the dialogic domain and not only include the other person, but also to show an effort of seeing the situation from the others' point of view and imagined world of concerns. C4 and Dora were shaping the design concept's narrative together, and the evolvment of that narrative was contingent on their mutual contextual and conversational participation.

In the context of language action (Denning & Dunham, 2006), Dora's offer to construct the scenario of herself and her brother from only his point of view for C4's clarity is an invitation for a negotiation, a relational action. Her offer indicated an awareness that what she had been doing up until this point was not working. Her offer also indicated that she was affectively and socially aware of Tulip's confusion. Dora recognized that this breakdown in sequential flow was not only her way of telling the story that was at issue, but that she had left out a main contextual ingredient: the participation of her "audience". Said another way, she had forgotten that it was C4's meaning-making with her that she was out to elicit in the scenario development. Her offer had the effect of re-inviting Tulip and Violet into a relational dynamic with her, and this was a relationally responsible move.

This skillful ability is not limited to situational or temporal or situational boundaries, as Tulip demonstrated in the Bailey interaction¹⁹⁸. As explained above about Finding Two, Tulip had changed her critical affect to one of appreciation, using her body, voice and pacing in a warmer and more relational way in turn 14 of the Bailey episode. When Tulip speaks of Bailey's former design experiments in an appreciative tone of voice, she does more than remind Bailey of her previous creative courageous experiments. Tulip's affective outreach infers she became responsible for the relational framework in which Bailey might recover herself and participate in the co-generation of the going opposite of Distinctive Greetings traditional image.

Tulip showed a level of compassionate responsiveness to Bailey's current deadline and problem-finding dilemma by the invitation for Bailey to re-enter the experience of creative risk-taking where she learned and garnered appreciation from C4. To do this, Tulip had to let go of her role as the critic-coach and explicitly become a co-participant with Bailey in a way Bailey had not yet experienced directly. While Tulip realized that Bailey's Warehouse experiments failed for Bailey's first design concept (random acts of social kindness), she reframed that 'failure' as a stepping stone for Bailey, and took a risk. Tulip stopped coming from her sense of what a student should do, and instead embellished the experiment "errors" as part of her invitation to Bailey to capitalize on Bailey's experiment finding that people liking to break rules and be disruptive. Tulip's move, and invitation to

¹⁹⁷ McNamee and Gergen (1999) posit that that human meaning is generated through relationship. Relational responsibility is a systemic dynamic between persons where actions are taken that enhance and sustain meaningful action from the relationship as well as further construct the relatedness emergent between the persons. Each conversational move may expand and deepen the dialogue and possibilities as well as make a new horizon of possible actions together so that meaning-making and coordination extend the horizon of future action (McNamee & Gergen, 1999).

¹⁹⁸ See Appendix T3, turn 14/193-194, where Tulip refers to the previous experiments Bailey did in the Warehouse.

Bailey is reminiscent of Barrett's (1998) conclusion that perhaps in organizational group settings, embracing the errors and the "mess of it" just might evolve the best outcomes, like jazz musicians do when they improvise (F. J. Barrett, 1998, 2012). Tulip's conversational choices in turn 14 helped to launch a pattern of further bifurcation points that Bailey then enacted in turns 16 and 18.

The bifurcation point pattern of choices and then the emergence of a new and more positive direction occurred in each of the vignettes. The ability to make greater or larger meanings depended on an action and contextual shift pattern. In that pattern, the participants accessed or generated implicative force as well as larger or newer contexts that they then would quickly want to take further actions to fulfill the newer possibility implications. It is noteworthy that the affective-social dynamics of Findings Two and Three established relational frames in which the newer implications could evolve, partially because the affective-social access points of appreciation, affirmation, tone of voice, pacing, and body movement with words spoken and generous creative listening enabled the willingness for the interactive 'us' to go beyond the cultural limitations any of the persons might have accessed previously (e.g., professors and students should and shouldn't do this and that). Bifurcation points are associated closely with the emergence of creative breakthrough in each of the vignettes, as are noted on the conversational maps in Appendices M2a-c for each student.

Different and affirming affective messages are also associated with these choice points¹⁹⁹. While it is possible to have an implicative change in a dialogue that is not positive, an implicative change signals a new future. Fortunately, by the participants' account, the specific and unique emergences of each student's design story and concept yielded a positive outcome and more possibility relationally than had been present for a good portion of the semester.

Social-Affective-Cognitive Process Helped the Additive Group Modification and Ideation (Finding Five) From the group educational session and interviews, the students reflected that their participation pattern was to refrain from adding ideas or suggesting modifications to another student's project until after the presenting student had had a chance to digest the C4 critique a bit. While Dora and Samantha did not speak in each other's or Bailey's episode, their later interviews revealed they were actively engaged by their listening.

For instance, both Rick and Bailey said later in sense-making interviews they wanted to be helpful to their colleagues, but were judicious with their help. How the students determined the process of another's digestion, why a comment was considered helpful, or when to interject was not explicitly described. From noting when and how student's interjected in the flow of the three vignettes, and from the interviews, three conclusions could be drawn. The first is that only Bailey and Rick felt comfortable enough to speak, whether this was due to personality, or general comfort in the industrial design work process is unknown. Dora and Samantha were from other design disciplines and perhaps more unsure of their work. Second, the students reported the main event of these sessions was C4's interaction with the presenting student, and that they had other time (e.g., namely on Wednesdays) to interact with each other's evolving design and Professor Robinson. Third,

¹⁹⁹ In Bailey's and Dora's sequences, affirmative statements or body movements are associated directly with the choice points, in Samantha's the overall emotion towards Samantha is affirmative, and affirmative head-nodding is happening between Wendy, Violet, Tulip, and Samantha in the turns leading up to Professor Robinson's question in Turn 13, see Appendix M2c Samantha's Complex Conversational Map and Appendix T3, Conversational Analysis Transcript of Samantha's Vignette.

since the main event was C4's critique and the brief fleshing out of what that could mean for the co- design with C4, the students may have felt that their ideas and comments could be most useful and best in an additive context. What is notable is that when the tensions began to rise, for instance in the Dora and Bailey interactions, Bailey and Rick (respectively) said they would interject a question or suggestion to help move the conversation forward, to help "un-stick" the presenter.

The additive pattern of group modification and the positive affective-social influence were evident in the Bailey and Samantha vignettes. In the Samantha vignette, Bailey's participation about a healthy diet trend²⁰⁰ sparks C4 then to pose a choice point for Samantha about whether her product would be classified as a medical or consumer product. Bailey and Rick playfully talk over each other to make ignitive contributions to Samantha about her avatar ideas that a consumer might access with Samantha's design concept,

Funny, if you could choose what you wanted to be, like I could be like a flower and Rick could be like a ... [and then Rick interjected] like a bear [whereupon Bailey talked over him and said] yeah, a bear student, one day a bear...and out killing fish [laughing] [and Rick responds on top of Bailey's utterance], or actually like my life." (Bailey, Rick²⁰¹)

This turn then launched other different avatar-twists, ideas and combinations for Samantha's avatars. Bailey, Tulip, Violet, and Rick built upon this direction from turns 24 until Samantha recaps what has occurred and how the design story is emerging more colorfully, and with emotion, as C4 had previously coached in turn 28. Tulip expressed enjoyment in the emergence and ties it into the design story as she said in turn 24,

I love this as sort of a way to a priority, the idea you could take 'sometimes I am a flower' one day, sometimes a dead flower and I feel like this but I want to feel like that and this [the device Samantha is designing] has a memory of your failures and dates associated with those positive states and it could bypass all the numbers and be like say, 'you should really go for a walk, that helps you'. (Tulip, turn 24²⁰²)

Rick asserted that the additive, design-solution ideas came quickly after Bailey and C4 had co-created a design problem worth addressing. As Rick put it, after evil Distinctive Greetings is said and echoed in turn 15 the "start of the brainstorm of this snowball[begins]. If evil is an icicle that falls at the top of the mountain and then it keeps growing and growing as we keep going" (Rick, interview). The most combinatory, freer-flowing idea exchange happened in Bailey's vignette, after she reframed her project and named it 'random acts of truth' in turn 18²⁰³.

Suggestions added by the group came after Tulip suggested that Bailey "go opposite from Distinctive Greetings." The emotional-social communication the group displayed in turn 14 (e.g., smiling, laughing, leaning in towards the camera, affirmative head-nodding) was more inviting and attractive to participation of the participants, and possibly more contributory and influential as well. The group's excitement about Tulip's idea to go opposite of Distinctive Greetings gave agreement to the proposition that she could change and be successful with aspects of her core concept (random social acts) with a surprising twist. In

²⁰⁰ See Appendix T2, turn 18/188-192.

²⁰¹ See Appendix T2, turn 23/229-232.

²⁰² See Appendix T2, turn 24/233-237.

²⁰³ See Appendix T3, turn 18/232-233.

the Bailey vignette, the group's listening²⁰⁴ and positive response to the Tulip-Bailey interchange in turn 14 helped Bailey accept the idea that she could reform her design problem from random social acts of kindness with strangers to random social acts with people you know. The group's enthusiasm also helped Bailey reverse the prior pattern in the vignette of Bailey not accepting C4's guidance. This example confirmed Amhag and Jakobsson's (2009) finding that those who listen are as critical as those who speak for creative meaning-making.

Once Bailey incorporated and reframed the critique as her own in turn 18, these idea modifications were additive for the implementation of the design concept. The group began to play with how the random acts of truth might be represented and the social situations where those might be used in turns 19 to 22, and again from turns 25 to 29²⁰⁵. Bailey remarked that while these additive ideas were helpful, there also was a saturation point for her, and she wanted to remove herself from the group and get to work. In responding to my question if the Distinctive Greeting Project verified or contradicted anything she had previously believed about creative collaboration, she confirmed that she thought the collaboration was important and that better ideas emerged from it, but qualified that the optimum number of collaborators should be three or four.

Other participants did not mention the number of participants as optimum for collaborative creativity as Bailey did, but indicated their agreement with Bailey's other observation that,

I don't think everybody in this had equal control. I don't think that's necessarily a bad thing. I just think, if I were to continue working on a project, everybody has sort of got to have an equal say. But this wasn't pure collaboration. This was still slightly class, and so there was sort of a hierarchy: Tulip and Violet were the most important points, and then everything else was up to the students to make something of it.
(Bailey)

Given the equal say disparity, the Levenson participants' deference to C4 as the primary shaper of each episodic interaction, and the difficulty with meaningful connection and relationship with each other over Adobe Connect, the best that could be done with conjoint idea modification and ideation between C4 and the students while they were in a group was additive, and not experienced as a true collaboration, since the sense of mutual, relational, and egalitarian relations were missing Lewis (2006). C4 did have a transformative effect with the students that facilitated creative breakthroughs, which is the focus of the next section, but it was not from an ideation pattern in a brainstorming modality.

Summary Conclusions of the Affective-Social Intersection The affective-social aspect was evident in what was said and done primarily by **positive actions**, appreciative and

²⁰⁴ Listening is normally regarded as a verb. I use it as a noun in this sentence. The way the group regarded and related to the Tulip-Bailey interaction had a distinct form, mood, timbre of their engagement in the interaction as a listening, and while in a verbal silence, communicated and contributed to the conversation. This listening engagement was observable from the audiotape as body movements, smiling, laughing, upright body posture, head-nodding and gestures made. Other authors or speakers have called this ability to see the listening, "reading the room", and generally it refers to sensing how people are responding to what is being said. While people are notoriously poor at "reading other people's minds" as Nicholas Epley's (2014) research has demonstrated, other scholar-practitioners have validated the concept of the affective-social cuing that comes from gauging the listening (Epley, 2014; Littleton & Miell, 2004; Miell & Littlejohn, 2004; Seddon, 2004).

²⁰⁵ For these references to Bailey's vignette, see Appendix T3.

affirmative comments and paralinguistic factors (e.g., affirmative head-nodding, smiling, laughing, joking, sounds, generous listening, and engaged body movements). These communications were made as invitations for more connection and relatedness and served to help participants let go of previous conceptualizations and open possibilities for new perspectives to be considered. Social-affective connection facilitated letting go of “should”, and that enabled participants to embrace and make something of errors, rather than spending energy in trying to look good to C4. Positive socially-affective cues were even more valuable to the participants in a frustrating situation for design co-evolution using the Adobe Connect internet interface.

In contrast, frustrating or uncomfortable social-affective dynamics spurred participants to see the situation from another’s point of view, look for new openings, fully let go of an old way of relating both to the design story as well as socially, and initiate new directions of action and meaning. When participants chose to do these things, the affect changed from negative to positive.

Relational responsibility was necessary for this collaborative group’s generation of creative breakthroughs. They held the interaction dissonance when the interaction has become too monologic, re-centered the conversation back into the dialogic domain, included the other person, showed compassionate responsiveness and made an effort of seeing the situation from the others’ point of view and imagined world of concerns. These relationally responsible moves enabled the accessing of more inclusive contexts for implications of more possibility and gave participants more choices. Choice points, or bifurcation points, were closely associated with the making of larger meaning, which was undergirded by patterns of contextual shifts, deontic logic shifts, and affirmative language.

The whole group’s positive affect had a facilitative impact socially, which in turn provided a respite and ease from the expertise, equal-say disparity the participants felt, but did not overcome when discussing modifications to a student’s design concept. This ease enabled participation for design solution suggestions, which made an additive, not transformative, contribution to the student presenters.

The Affective-Cognitive Intersection: Finding Five—The Facilitative Effect of Group Ideation with Advanced Creators

C4 facilitated and orchestrated the design conversations so that creative breakthroughs did occur although they did not report they had a breakthrough focus in mind when they worked with the students. As professional designers and creators across an array of fields, dilemmas, and organizational types, they had the skillful means to channel and redirect emotion and affect so that the design problems could be propelled towards design solutions and boundaries would be pushed with ideation and modification²⁰⁶. Tulip remarked to me after the Group Educational session that their focus on making connections often made the difference for a truly unique design solution to a client dilemma. Perhaps because of their experience they had the confidence in their ability to critically discern the logics in any situation and looked for the systemic order and interrelationships within each situation, including emotional ones as even emotional situations have cognitive elements (Elder & Paul, 2007). They then could better distinguish relevant from irrelevant design conversation, manage the inferences and interpretations that might derail conversations, coordinate

²⁰⁶ C4 pushed boundaries with each other and with Professor Robinson (in the Samantha episode, turns 13-17), as well as with the students (Bailey episode, turn 14-17).

together and manage their own possible discomfort, and acknowledge possible background emotion simultaneously with offering alternative perspectives. This happened in the Samantha vignette with Professor Robinson, the Bailey episode with Bailey, and with Dora in the Dora episode. As discussed above, they did this with critique, generative metaphors and analogies, body language, tone of voice, and relationally responsible moves in each of the vignettes.

C4 could facilitate creative breakthroughs despite the communication breakdowns in the student sessions or challenges from the general conversational conditions. They had greater access, expertise, and practice in the co-creation of plausible new design narratives over a larger, and disparate social network with client groups representing different organizational functions and concerns. Most specifically, they had the expertise, history, and confidence to deal effectively with the client interface with the mutual generation of innovative products. Because of this greater experience, they could hold the eruptive tensions while exploring the design story and concept development. As Tulip explained to the students and to me in an interview, “Have to deliver what clients need emotionally in addition to the work” (Tulip).

In the Bailey and Dora vignettes described above, Violet and Tulip used teamwork in bringing forth integrated focus from discordant and disorganized idea collections. Often Tulip would initiate the most critical critique and Violet would provide either greater context by situating the concern in industry trends, or make relational moves to open the listening²⁰⁷ or widen the students’ perspectives, which would diffuse triggered negative emotion. As Verganti(2003), Hargadon and Sutton (1997) and Mascitelli (2000) concluded, professional designers have the ability to harness tacit and experiential knowledge and effectively use the emotional and affective nuances that arise in group ideation and modification for creative breakthrough generation (Hargadon & Sutton, 1997; Mascitelli, 2000; Verganti, 2003).

Unlike the professional designer groups with similar ranges of expertise, in the case of Distinctive Greetings Project, the professional designers had to also manage the anticipatory emotional stress that the students reported they felt when meeting with C4. The stress may be attributable to a desire to impress the ‘authorities’, be they professors or professional designers, as Schrand and Eliason (2012) found about students’ experience in final critiques (Schrand & Eliason, 2012, p. 57). Additionally, the stress may be attributable to generalized difficulties with the design task of concept generation, as Chen and Tang (2013) found that it was the most difficult design task for undergraduates in industrial design courses with studio pedagogy (W. Chen & Tang, 2013, p.1505).

In an interview, Wendy confirmed that in group ideation, C4’s practice and context is to look for and foster a multiplicity of connections in order to build a design narrative and concept. They did this in the Samantha vignette with their positive feelings about Samantha’s work to build her design story and concept further, and connecting those twice to current market trends²⁰⁸. These connections to larger contexts add a depth of meaning and relevance to Samantha’s proposed design. Tensions had arisen between C4 and Professor Robinson between turns 13-15²⁰⁹, and Violet’s connections to larger contexts diffused the

²⁰⁷ This teamwork approach was evident in the Dora vignette and the Bailey vignette. Tulip notably shifts to relational moves in the Bailey vignette in the pivotal Turn 14. In the Samantha vignette, Violet lead with critique and Tulip supported.

²⁰⁸ See Appendix T2, turn 19/193-200 and turn 20/203-209, 211-216.

²⁰⁹ See Appendix T2, turn 14/159-160; turn 15/165-167; and turn 17/183-186.

tensions, in part by acknowledging the attempted contribution of Professor Robinson while providing a rationale for C4's earlier rejection of his idea²¹⁰. These moves also simultaneously offered an expanded possibility for how Distinctive Greetings and Samantha could consider her design concept. Violet elevated the conversation.

In critique delivery and then working with the students to evolve the next iteration of the design story and design concepts, Violet and Tulip were aware and responsive to the emotional and affective undercurrents of the background conversations that poked through in the foregrounded comments (e.g., Bailey: "I don't know if Distinctive Greetings would like it") while still propelling the design forward. Their comments for idea generation were not presented in brainstorming mode, but rather as points of reflection, observation, or discussion made usually in analogy or metaphor. Metaphor invited opening to new possible meanings and created relational linkages that facilitated further engagement and ongoing negotiation between participants.

For instance, as an adept narrator, Violet acknowledged both Bailey's uncertainty about Tulip's suggestion and reframed what value it and the other student projects could be for Distinctive Greetings overall in a metaphor when she said in turn 17 of Bailey's episode, I think that Distinctive Greetings has suffered from being too, too tea-partyingly sweet for all these years and like there's a new generation of people, and part of expressing yourself is actually saying what's on your mind instead of pretending to like people. (Violet, turn 17)

This comment gave further permission to Bailey to authentically claim the 'going opposite' suggestion as her design problem. The propellant pattern the Tulip, Bailey, and Violet were in about the design problem completed when Bailey reframed the suggestion in Turn 18 and expressed it in her words, "random acts of truth." Additive group ideation and modification on how Bailey could solve that design problem followed in another meta-reframe Violet made in turn 23,

It starts to make me think that at least $\frac{3}{4}$ of the presentations [to Distinctive Greetings] are in a lot of ways, be a bit controversial to Distinctive Greetings. Rick saying you don't need to be close with your family and Samantha saying instead of spending all your time building relationships with other people, learn to have a relationship with yourself, and you saying what you really mean. And we should be a bit controversial and be real, Distinctive Greetings can be real and tell the truth. (Violet, turn 23²¹¹)

In a later interview reviewing the Project overall, Violet remarked that she thought the effectiveness of collaboration is historically correlated with the ability to see and hear the nuance in people's voices and actions. Since the Adobe Connect tool frustrated the seeing and hearing of the nuance of people's voices and actions, Violet and Tulip were more attuned to picking up on whatever cues they could perceive and using them to access larger contexts so as to propel the design forward. Accessing larger contexts is dependent on how flexible one can be in shifting one's own identity context and both Tulip and Violet shared in their final interviews that they reframed their own capacities as design facilitators. Tulip remarked that she had to step outside of her propensity to be a participant and take on more perspectives as a coach or a facilitator when co-constructing a design with others that are not

²¹⁰ See Appendix T2, turn 16/177-179 and turn 19/195-202.

²¹¹ See Appendix T3 for linkage of these turns to the Bailey vignette.

as steeped in design experience. Violet said this project challenged her to shift her customary frames of reference from design group collaborative co-construction to organizational co-constructions.

Summary Conclusions of the Affective-Cognitive Intersection Creative breakthroughs were facilitated by the skillful ability of professional designers to hold, acknowledge, use, channel, and diffuse emotions and affect so as to continually make new cognitive connections. Disruptive tensions, tempers, and the anticipatory stress of others were acknowledged and diffused while maintaining the main creative task focus. The professional designers had the ability to facilitate emergent coherence of design scenarios and concepts, even with possible background distractions by the integration of various story-lines and making connections to larger contexts. Finally, professional designers were accepting of negative emotion as part of the innovative process.

Appendix H

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1. Figure 1: Possibility of Contextual Influence for Individuals and A Group in Interaction

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You are most welcome. I think Barnett has been present in many ways as you have done this remarkable and deeply immersive work.

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