

Negotiating (Inter)Disciplinary Identity  
in Integrative Graduate Education

by

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## ABSTRACT

Identity, or peoples' situated sense of self, can be conceptualized and operationalized in a myriad of ways, including, among others, a person's gender, socioeconomic status, degree of expertise, nationality, and disciplinary training. This study conceptualizes identity as fluid and constructed through social interaction with others, where individuals ask themselves "Who am I?" in relation to the people around them. Such a discursive conceptualization argues that we can observe peoples' performance of identity through the close reading and examination of their talk and text. By discursively drawing boundaries around descriptions of "Who I am," people inherently attribute value to preferred identities and devalue undesirable, "other" selves. This study analyzes ten workshops from the Toolbox Project conducted with graduate student scientists participating in the Integrative Graduate Education Research Traineeship (IGERT) program. The emotional tone, mood, and atmosphere of shared humor and laughter emerged as a context through which collaborators tested the limits of different identities and questioned taken for granted assumptions about their disciplinary identities and approaches to research. Through jokes, humorous comments, sarcasm, and laughter, students engaged in three primary forms of othering: 1) unifying the entire group against people outside the group, 2) differentiating group members against each other, and 3) differentiating oneself in comparison to the rest of the group. I use action-implicative discourse analysis to reconstruct these communicative practices at three levels—problem, technical, and philosophical—and explore the implications of group

laughter and humor as sites of “othering” discursive strategies in graduate students’ efforts to negotiate and differentiate identity in the context of integrative collaboration.

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## INTRODUCTION

Identity, or peoples' situated sense of self, can be conceptualized and operationalized in a myriad of ways, including, among others, a person's gender, socioeconomic status, degree of expertise, nationality, and disciplinary training. This study conceptualizes identity as fluid and constructed through social interaction with others, where individuals ask themselves "Who am I?" in relation to the people around them. Such a discursive conceptualization argues that we can observe peoples' performance of identity through the close reading and examination of their talk and text. Identity (re)negotiation can happen at any time during a person's organizational membership. Of particular importance to this analysis is a person's entry into a new group or role. During this entry period, organizational members learn expectations for communication, behavior, and identity through a process of socialization. This critical stage of group development lays the groundwork for present and future practices which create and reinforce group members' identities. One such practice is the expression and experience of emotion. Acceptable practices regarding the expression and communication of emotion are often determined by group members, who continuously negotiate what constitutes "acceptable" behavior over time. Humor is one communicative construct related to emotion which has been shown to help members make sense of their identity in organizational settings and socialize newcomers to a particular role or position. Research demonstrates the effect of humor and emotion on group members' creativity, collaborative capacity, and decision making processes. Positive affect can play a key role in the success or failure of a group, influencing group dynamics at the individual level by



opening a person's mind to consider new possibilities and managing skepticism of risky or uncertain ideas, as well as the group level, increasing members' willingness to collaborate, share ideas, and negotiate conflict outcomes.

However, despite the abundance of studies investigating emotion, organizational socialization, and identity development in non-academic settings, scholars and researchers have yet to combine these three bodies of work as a lens through which to critically examine and understand their own identity formation and socialization practices. The current analysis addresses this scarcity of knowledge by focusing on the communicative practices of scientists working in diverse teams spanning multiple disciplines, a focus area which is the purview of the science of team science field. Though the field seeks to ameliorate challenges facing interdisciplinary collaboration, it does not currently attend to the relational dynamics between collaborators, though a small number of scholars are beginning to acknowledge the importance of studying scientists' interactions. This study leverages the knowledge gained from previous studies examining emotion, identity negotiation, and interdisciplinary collaboration with the goal of improving how scientists organize around common problem-oriented research projects, as well as how they relate to one another as people during collaboration.

## REVIEW OF THE LITERATURE

### **Conceptualizing Identity as Social and Discursive**

Identity is a self-referential description that answers the question "Who am I?" or "Who are we?" and draws upon the multiplicity of social identities which individuals possess in a given context (Ashforth & Johnson, 2001; Ashforth, Harrison, & Corley,

2008). Peoples' ability to construct and negotiate different identities is predicated on their situated definition of self, "a sense of who they are in [a] particular context" (Ashforth, Harrison, & Sluss, 2014, p. 14). Dimensions of a person's identity can include gender, religious affiliation, race, culture, socioeconomic status, and sexual orientation, among others (Jones & McEwen, 2000). Identities are social—that is, they are socially constructed, in that people draw a sense of self based on their relationships and interactions with others. Through socialization interactions and relationships, organizational members develop a set of rules and resources which dictate their behavior and conceptualization of who they are (Scott, Corman, & Cheney, 1998). Such a process of organizational members' socialization of each other into role and hierarchical positions assumes that the interactions between people shape ensuing identities. This conceptualization of organizational socialization supports an orientation toward identity as a discursive construction.

This study adopts the notion that identities are discursive, that people construct and develop identities through discourse, the everyday talk and text which comprises social interaction with other people and the environment. Because identities are socially and discursively constructed, and because the nature of social interactions and societal standards and expectations for behavior are not static, identities can change over time to suit the evolving social scene. Sociologists (Somers, 1994) and psychologists (Hogg, Terry, & White, 1995) have long argued in favor of the discursive nature of identity. Likewise, organizational communication scholars have studied identity (re)formation as an outcome of discursive acts (Kuhn & Nelson, 2002), a set of discursive and material

processes by which social identities and relations are constantly renegotiated (Cheney & Ashcraft, 2007), a process situated in historical occupation and role discourse (Ashcraft, 2007), and a communicative negotiation between different identity groups (Lammers, Atouba, & Carlson, 2013). Examining identity through a communication lens highlights the rhetorical nature of identity formation (Cheney & Ashcraft, 2007) and draws attention to another component of identity. By discursively drawing boundaries around descriptions of “Who I am,” people inherently attribute value to preferred identities and devalue undesirable, “other” selves.

The discursive creation of “other” selves through social interactions, talk, and text “defines and secures one’s own identity by distancing and stigmatising an(other)” (Grove & Zwi, 2006, p. 1933). Many empirical studies and analyses of “othering” follow a critical discourse tradition, where othering tactics are meant to “reinforce and reproduce positions of domination and subordination” (Johnson et al., 2004, p. 253). Such studies examine the discursive practices of othering migrants and refugees (Grove & Zwi, 2006; Olsen et al., 2016), people with disabilities (Mik-Meyer, 2016), women trying to receive healthcare services (Johnson et al., 2004), and breastfeeding mothers (Grant, 2016). Within the organizational communication tradition, Lammers et al. (2013) examined members’ move away from organizational identities in favor of professional persona through an explicit process of “othering,” Nelson-March et al. (2008) interrogated what and where “the Other” exists in which subjects (topics) and subjects (people) are worthy of inquiry, and Bach (2005) examined othering practices in academia with regard to Institutional Review Boards. Because this study adopts the stance of identities as being

discursively constructed, the discursive “othering” of undesirable identities, as well as the adoption and emulation of preferred identities, can occur at any time during an organizational member’s tenure at an organization as that person interacts with and sees him- or herself relative to the people with whom he or she associates. However, the time which is arguably the most influential in shaping an organizational member’s sense of desirable and undesirable selves is the initial entry period when he or she is first socialized into his or her organizational role.

Organizational socialization is the “process by which an individual adjusts to a specific role within an organization” (Chao et al., 1994, p. 730), as well as the methods through which organizations help newcomers adapt to organizational experiences (Allen, 2006). Socialization into new roles occurs for newcomers to an organization as well as incumbents entering a new job or role within an organization (Ashforth, Harrison, & Sluss, 2014). Newcomers’ successful socialization into acceptable organizational behaviors and communication practices is often mediated by their ability to seek out information for role clarity (Bauer et al., 2007) and emulate established colleagues (Filstad, 2011). As its name suggests, organizational socialization is inherently social, unfolding through an individual’s interactions with other group members over time. Through the organizational socialization process, members learn what is and is not prototypical of desired and undesired social categories (Hogg & Reid, 2006) and seek to develop an analogous, consistent identity which reflects their new role in the organization. One area of communicative standards and expectations which organizational members learn during the socialization process is what constitutes

acceptable displays of emotion, as well as the various functions of emotion in a given organizational context.

### **The Role of Emotion in Group Collaboration and Creativity**

Emotions play an important role in the organizing processes of organizational members and are thus a key component of successful organizational socialization. The sharing of cognitive ideas and the transmission of emotional states between group members are distinct phenomena. Whereas words and the explicit expression of thoughts are often necessary for cognitive ideas to transfer between group members, the transfer of emotion is qualitatively different, often relying on nonverbal, tacit behaviors such as body language and facial expression (Barsade, 2002; Barsade & O'Neill, 2016). A group's ability to function effectively and efficiently often hinges on members' willingness to engage in collaborative behaviors which include, but are not limited to, perspective taking, active listening, conflict management and resolution, and collective decision making. Group members' collaborative capacity for these behaviors depends on their emotional intelligence (Chang et al., 2012), awareness of incidental emotions (Dunn & Schweitzer, 2005), emotional perceptions, and reactions to conflict (Ayoko et al., 2008).

Decision making is one collaborative context wherein emotions directly impact group member dynamics, processes, and outcomes. Andrade and Ariely (2009) found that, contrary to prevailing belief, an emotion's effect on group behavior did not dissipate once the emotion itself transpired. On the contrary, an emotional state provides the basis for future decisions and decision making processes well beyond the emotional

experience, however fleeting. Subsequent studies have confirmed the assertion that emotions constitute a pervasive effect on decision making processes where individuals employ past emotions to present and future appraisals and decisions (Nica & Molnar, 2014). Similarly, Filipowicz et al. (2011) found that individuals who experienced and displayed emotional transitions during the negotiation process affected the negotiation outcomes more significantly than those who maintained constant emotional states (i.e. transitioning from happiness to anger as opposed to expressing anger for the whole interaction). The implications of emotional states, emotional transitions, and emotional experiences on the decision making process are significant for those engaged in collaborative teamwork. Decisions and decision making processes characterize nearly every step of the collaborative science process, whether those decisions occur as an individual or among group members. Collaborative science unfolds through the process of making decisions and moving forward in a conversation, meeting, presentation, or project based on the decision's result. Part of a group member's consideration of proposed alternatives in the decision making process is his or her trust in another team member, another factor influenced by emotion. Happiness engenders more trust than sadness, and sadness engenders more trust than anger (Dunn & Schweitzer, 2005). Not only do emotions significantly influence trust in the decision making process, but they also impact the cognitive effort with which a group member engages in logical reasoning and problem solving (Barsade, 2002). Because decision making is a key component of collaboration, the ways in which peoples' emotional states and awareness shape decision

making processes hold important implications for understanding the role of emotion in collaborative science.

Through their decision making processes, scientists often strive to produce novel, useful ideas or problem solutions which are thus regarded as creative (Amabile et al., 2005). Like collaboration, creativity and the creative process represent phenomena comprised of both cognitive and affective parts. Positive affect helps a person open his or her mind to variety and possibility necessary for creativity and creative thought to occur (Amabile et al., 2005). Emotions also serve to manage the skepticism associated with conceiving creative ideas and working to bring them to fruition (Parker & Hackett, 2012). In collaborative science contexts, where the objective is to research, develop, execute, and translate research findings into products and/or services which can improve the quality of life for people around the world, a group or network's success often lies in its ability to produce novel, useful, creative ideas and solutions. Competitive research grant programs reward applicants who propose groundbreaking, novel approaches to complex issues and demonstrate the potential to shape research and practices in new and exciting ways. Emotion “metaphorically ignites and fuels creative collaboration, and often leads to productive research outcomes” (Cheruvilil et al., 2014, p. 34). The impact of emotion on creativity occurs at the individual level (Amabile et al., 2005) and the group level, directly facilitating social, cognitive, and motivational processes relevant to creativity (Shin, 2014), as well as supporting socio-emotional processes essential to facilitating knowledge production and emotional commitment to the team (Parker & Hackett, 2012). Based on their seven year, longitudinal study of a geographically dispersed research

network, Parker and Hackett (2012) argue that emotions are central to scientific collaboration. The high degree of trust resulting from such emotional connection supported the network's distal collaboration and kept members invested in the success of the network year after year.

It is clear that emotions are social (Parkinson, 1996), affect collaboration, decision making, and creative thought processes, and can influence both the behavior of the person who directly feels and expresses the emotion, as well as those who perceive emotions being felt by others (Filipowicz et al., 2011). Over time, people who work in common spaces and spend extended time working together begin to develop and share similar affect, mood, and emotions (Delvaux et al., 2015), experiencing emotional contagion which has been well documented and studied (Barsade, 2002; Kelly & Barsade, 2001; Nico & Molnar, 2014). Some scholars argue that affect is so pervasive that it can be implicit and subconscious, influencing a person's thoughts and behavior without his or her direct awareness (Barsade, Ramarajan, & Westen, 2009). And yet, there is little agreement or understanding about acceptable or appropriate kinds of emotion in scientific teams, or its presentation and influence in scientific research. Too much fear can be toxic and silence group members or strip them of their agency. Too much joy can impede the conduct of work and progress. Too much companionate affection or love can prevent honest and open communication which might lead to conflict (Barsade & O'Neill, 2016). As organizational members are socialized into an organization, they learn the appropriate behaviors and emotional expressions which fulfill preferred identities.



## **Using Humor to Negotiate Identity**

One of the ways people can use emotion to negotiate competing or conflicting identities is through humor. In his meta-analysis of humor theory, Meyer (2000) found that the three main theories of humor—relief, superiority, and incongruity—broke down into two basic functions: unification and division. Humor functions to build support by identifying areas of overlap between communicators with their audiences and creates contrast when speakers differentiate themselves from a view, thought, or social group (Meyer, 2000). Likewise, the laughter which follows can exacerbate and further distance a member from the group, or remedy problematic and conflicting situations by releasing collective tension (Kangasharju & Nikko, 2009). Humor and its accompanying emotional displays are inherently rhetorical and communicative in nature. Through a rhetorical frame, we can better understand how humor influences audiences (Meyer, 2000). By examining humor and laughter as discursive communication practices, communication scholars situate language and discourse as central and attempt to understand how humor and laughter simultaneously contribute to group organizing processes and the development of member identities (Tracy, Myers, & Scott, 2006).

In regard to identity, communication scholars have examined how humor and its associated emotion displays (particularly laughter) help organizational members negotiate paradoxes of identity, power, structure, and gender (Martin, 2004), shape organizational socialization processes (Heiss & Carmack, 2012), manage bizarre or emotional events at work (Shuler & Sypher, 2000), shape and affirm preferred identities (Tracy, Myers, & Scott, 2006), and build group cohesiveness (Greatbatch & Clark, 2003). Such

conceptualizations of humor reveal socially constructed values by making public through laughter what is and is not humorous in certain contexts. Humor and laughter, particularly when experienced in groups, shape the meaning and interpretation of future events, situations, and tasks for observers and participants (Tracy, Myers, & Scott, 2006), making these phenomena insightful frames through which we can understand scientists discursive development of identity during the “naissance” time frame.

Thus, we can see the role of emotion in creativity and collaborative work, as well as the significance of organizational socialization processes in shaping members’ individual and group identities. Such socialization processes unfold through communicative interactions between organizational members and (re)produce expectations for behavior in present and future exchanges, both in terms of the distribution of information as well as the experience of emotion. However, investigations of emotion in collaboration, organizational socialization, and identity negotiation have focused on organizational contexts outside of academia, despite the call for scholars in the academy to audit, examine, and critique their own communicative practices and standards (Kuhn & Nelson, 2002; Tracy & Trethewey, 2005).

### **The Science of Team Science Approach to Understanding Collaboration**

The science of team science emerged as a standalone research field with a special supplemental issue in the *American Journal of Preventative Medicine* in August of 2008. The overarching goal of the field is to better understand and enhance large-scale collaborative research and training programs comprised of scientists and researchers in diverse disciplines and fields (Stokols et al., 2008a). The field is grounded primarily in

the National Institutes of Health and began holding annual conferences in 2010, which invited attendees to submit and present on how to “maximize the efficiency and effectiveness of team-based research” (<http://www.scienceofteams.org/>). Shortly after the supplemental issue, leaders in the science of team science field published a series of critical literature reviews on the nature of interdisciplinary team science (Fiore, 2008), conceptualizations of collaboration (Hall et al., 2008a), phases of interdisciplinary research (Hays, 2008), and contextual influences on collaboration (Stokols et al., 2008b). These reviews sought to begin drawing boundaries around the still-amorphous field and identify its core concerns (Stokols et al., 2008a), and provided a conceptual groundwork upon which to begin identifying teams as interdisciplinary and increase awareness of the complex academic and governmental environments in which these diverse teams operate. The primary methodology which emerged was survey-based assessments of large-scale, governmental research agencies studying tobacco use (Masse et al., 2008, cited 103 times since) and collaboration readiness of health scientists at the National Cancer Institute (Hall et al., 2008b, cited 97 times since).

Two years after the introduction of the supplemental issue, leaders in the field once again attempted to map out the science of team science (Falk- Krzesinski et al., 2010; Falk- Krzesinski et al., 2011), seeking input from over 200 stakeholders in the team science community including team science practitioners and principal investigators leading research centers, investigators studying scientific teams, team science funders and policy makers, research development professionals, and data providers and analytics developers. Publications from the team science community in the years following Falk-

Krzesinski et al.'s (2011) conceptual road map sought to address these agenda components with a series of proposed theoretical and conceptual frameworks and models through which to study interdisciplinary science teams. Scholars proposed a mesolevel model of group collaboration (Keyton & Ford, 2008), systems theory (Borner et al., 2010), creating a typology of interdisciplinary collaboration (Huutoniemi et al., 2010), a social cognitive framework of team innovation (Paletz & Schunn, 2010), an integrative capacity framework (Salazar et al., 2012), a four phase model for interdisciplinary team development (Hall et al., 2012b), a multilevel conceptualization of collaboration contexts (Bedwell et al., 2012), and interactive team cognition theory (Cooke et al., 2013). All of this is to say that the prevailing focus within the science of team science community has historically been the effort to control and plan for the environments, contexts, and frameworks within which collaborative science teams operate—not on the scientists themselves. What is missing from the current science of team science literature are the stories and experiences of the people who comprise collaborative science teams. Perhaps in the development of the field its leaders sought to take a top-down approach, creating theoretical and conceptual frameworks to be empirically tested by others down the line. However, such empirical falsification or support of the theoretical frameworks described above has yet to come to fruition.

### **Relational Dynamics of Collaborative Science**

In the past few years, a small but growing contingent of scholars and team science practitioners have shifted their focus to the experiences of scientists working within team science, and the interpersonal components of scientific collaboration. Thompson's (2009)

ethnographic study of an interdisciplinary research team identified the challenges of building communicative competence between team members, and the importance of developing familiarity and trust in the interest of successful collaboration. Bennett, Gadlin, and Levine-Finley's (2010) field guide for collaborative science explicitly called attention to the interpersonal and emotional challenges facing both team members and team leaders, cautioning readers that "strong scientific and interpersonal communication skills are critical and required to keep the group interacting, cohesive, and on course" (p. 6). The authors also differentiate between communicating about science and interpersonal interactions with group members which may or may not be science-related. Cheruvilil et al. (2014) list effective communication as a key hallmark of what they refer to as "high performing collaborative research teams," identifying social sensitivity and emotional engagement as interpersonal skills which strongly influence research outcomes, in the authors' experience. Hall and O'Rourke (2014) differentiate between informational and relational components of communication and conceive of communication as a construction process where people co-construct meaning through interaction. The authors assert that this co-construction occurs in the everyday interactions between group members, their conversations, meetings, writing, and interactions which all qualify as collaboration. Both Piso et al. (2014) and Read et al. (2016) shared the results and analysis of workshops conducted by the authors to promote and encourage integrative capacity and trust among interdisciplinary team members, paying attention to the importance of social relationships among participants.

Despite the growing interest among individual scholars in regard to interpersonal components of collaboration, the National Academies' April 2015 report titled *Enhancing the Effectiveness of Team Science* still focused primarily on cognitive dimensions of collaboration (Cooke & Hilton, 2015). These dimensions included task and role diversity of team members, availability of institutional and organizational resources to support collaboration, and quantitative evaluation of bibliometric outputs from team science. Apart from citing sources in passing which recommend attention to socio-emotional needs of teams, the report did not explore emotional, affective facets of scientific collaboration, nor does it analyze or recommend a focus on understanding situated, relational processes between group members. The prevalence of cognitive challenges and recommendations within the report is unsurprising, given the science of team science focus on cognitive aspects of collaboration in the past (Cooke et al., 2013; Fiore & Salas, 2004).

In sum, research demonstrates the importance of affect in regard to organizational outcomes. People in a positive state of affect are more willing to engage in prosocial behaviors with teammates, resolve conflict in constructive ways, and think outside the box for more creative, innovative solutions. On the other hand, negative emotion reduces organizational members' willingness to entertain new ideas and increases burnout and absenteeism. While it is true that people have feelings which occur *intrapersonally* and do not go beyond individual experience, in organizational, group, and team settings emotions often occur *interpersonally*, are expressed to others and subsequently incorporated into the social fabric of a group, shaping future communication, interactions,

productivity, and creativity. The emotional, relational component of collaboration and its effect on a team's productivity and creativity have important implications for teams working in highly innovative contexts like scientific research and development. Even in light of the proven potential of understanding and leveraging emotional components of collaboration, most people assume scientific breakthroughs will result from more efficient task management of scientists.

This efficiency view neglects attention to the emotional facets of innovating and creating in diverse groups. Despite the widespread understanding of the importance and social nature of emotion in organizational contexts, these findings have not been fully translated to, explored, or ratified within interdisciplinary science. Whereas the current team science agenda has focused primarily on cognitive components of teamwork and collaborative science, it is clear that greater appreciation of the emotional components of collaboration can lead to deeper understanding of collaborative success. We need a deeper understanding of emotions in context within collaborative science teams to better relate to and improve the experiences of scholars and researchers who comprise these teams, as well as contribute to the current literature suggesting best practices and heuristics for leading and working in interdisciplinary science contexts.

However, the study of real-time natural interactions using recorded data remains a poorly covered area of emotion research (Kangasharju & Nikko, 2009), as well as research examining the situated, discursive negotiation of identity in interdisciplinary contexts. Such limited understanding is due, in part, to the difficulty of gaining access to interdisciplinary networks and research groups at the outset of their project and

developing trust as a participant observer (Tracy, 2013). Though some communication scholars have integrated themselves into interdisciplinary networks (i.e. Thompson, 2009), analyses of discourse require close textual or transcript analysis, data which are difficult to collect for outsiders. Some interdisciplinary groups include interpretive social scientists with expertise in qualitative data collection and analysis, but these members are often included in the group to help advance the research study in question—not study the progress and communicative practices of the group itself.

The analysis presented here combines three lines of research—the role of emotion in group collaboration, the conceptualization of identity as discursive, and challenges facing interdisciplinary collaborators—to create a greater understanding of interdisciplinary collaborators’ identity development, how identity is discursively managed in real-time interactions, and the impact of emotion on identity negotiation. To this end, I propose the following research question:

RQ: How do scientists negotiate identity through laughter and humor?

## METHODS

To understand scientists’ negotiation of identity in the context of interdisciplinary collaboration, this study focuses on real-time, situated, interactional data from The Toolbox Project, a facilitation approach which grew out of an IGERT project funded by the National Science Foundation. The initial project required students in biophysical and social sciences to collaborate on their doctoral projects in cross-disciplinary groups (O’Rourke & Crowley, 2013). Since its initial funding in 2006, The Toolbox Project has facilitated 178 workshops with diverse groups and teams in the United States, Canada,



Australia, Sweden, Japan, and Kenya. The hypothesis behind the Toolbox Project is that “the mutual understanding generated by this type of dialogue will support enhanced group communication, thereby improving the project group’s ability to identify and surmount [cross-disciplinary research] challenges as they arise” (O’Rourke & Crowley, 2013, p. 1942). The outcome of critical awareness and mutual understanding of alternate approaches to research and understanding the world is of key importance to the Toolbox creators, who are based out of Philosophy departments at their respective universities. Borrego and Newswander (2010) argue that this critical awareness is the route by which the humanities can most expand conceptualizations of interdisciplinarity in science and engineering. During the workshop, a facilitator keeps track of time and makes sure participants address each of the six sections within the survey instrument, described below. Facilitators, who audio record the workshop proceedings, are accompanied by an observer who documents participants’ speaking turns for accuracy in audio transcription.

### **The Toolbox Instrument**

Toolbox workshops center around the Toolbox Instrument, a set of 33 prompts divided into six sections— Motivation, Methodology, Confirmation, Reality, Values, and Reductionism—and organized by two categories, which structure the ensuing dialogue among collaborators and are meant to help groups identify and examine the range of assumptions they make about research in general and the specific project at hand. The first category, Epistemology, explores “what humans are like that we may know the world,” whereas the Metaphysics category addresses “what the world is like that humans may know it” (O’Rourke & Crowley, 2013, p. 1943). Scholars and researchers often take

for granted their worldview and orientation toward research, the world, and ways of knowing. The prompts associated with each section create a context for dialogue and communication among group members where training and disciplinary differences lead to the explanation of dissimilar theoretical, philosophical, and methodological approaches (Stokols, 2014). Each prompt is strategically ambiguous, leaving wide room for interpretation and debate over terminology which often forms the core of workshop discussion (i.e. What is “applied” research? What constitutes “relevant” data? How strict are “strict” requirements?) Such discussions put participants in a position where they must explain codified, assumed knowledge which is commonplace in their discipline, department, or community, but which is unfamiliar to their diverse group members. Below are two tables which summarize the six sections, their core questions, and the assumptions they address.

<b>Category</b>	<b>Section</b>	<b>Core Question</b>	<b>Stage of “Research Trajectory”</b>
Epistemology	Motivation	Does the principal value of research stem from its applicability for solving problems or its potential for making basic discoveries?	What motivates researchers to initiate a research project
	Methodology	What methods do you employ in your disciplinary research (e.g. experimental, case study, observational, modeling)?	How, as researchers, they collect and evaluate relevant data
	Confirmation	What types of evidentiary support are required for knowledge?	How they identify when they have knowledge

**Table 1.** Summary of Epistemology section headers and focus areas for the Toolbox Instrument

Category	Section	Core Question	Aspect of the World Under Investigation
Metaphysics	Reality	Do the products of scientific research more closely reflect the nature of the world or the researcher's perspective?	Whether the world is independent of the investigators
	Values	Do values negatively influence scientific research?	Whether values are an essential part of the world
	Reductionism	Can the world under investigation be reduced to independent elements for study?	Whether the world must be reduced for explanatory purposes to more basic elements

**Table 2.** Summary of Metaphysics section headers and focus areas for the Toolbox Instrument

Workshops are lightly facilitated, meaning participants choose which prompts to discuss, the order in which they are addressed, and the length of time spent discussing each, though the facilitator may step in to ensure that all sections are at least touched upon in the course of the workshop.

### **Critical Incident Sampling: IGERT Toolbox Workshops**

The National Science Foundation funds Integrative Graduate Education and Research Training (IGERT) programs with the explicit purpose of training graduate students to transcend traditional disciplinary boundaries. Between 2009 and 2013, The Toolbox Project conducted ten workshops with IGERT student groups at four different universities in the United States. The workshops were often conducted at the outset of a new IGERT collaboration, while group members were still getting to know each other, understand the perspectives of their fellow group members, becoming socialized to their roles within the group, and trying to create the foundation for relationships which would continue to grow over the course of the funding period. IGERT graduates who published on their experiences underscored the need to develop cross-disciplinary communication

skills due to the diversity of their IGERT cohort (Vinhateiro et al., 2012) and in the interest of explaining ideas and research topics to scientists outside their home department (Moslemi et al., 2009).

While many of the 178 Toolbox workshops could serve as sites for examining communicative processes of negotiating difference, relationship development, and emotion in the context of interdisciplinary collaboration, IGERT programs specifically recruit student scientists under the auspice of inter- and cross-disciplinary training, as well as personal and professional skill development in this regard. Because participation in IGERT programs is not only voluntary, but highly competitive, analyzing the communication practices of IGERT student groups can provide a positive case analysis of collaborative communication in practice. That is, students in IGERT groups knowingly apply for interdisciplinary collaboration, and are eventually selected for funding based on the review board's assumption and hope that the collaboration will yield successful outcomes. Thus, analyzing IGERT students' communicative practices in Toolbox workshops, which use strategically ambiguous prompts with the intent of sparking constructive debate and dialogue, represents a critical case for analysis (Flyvbjerg, 2011). When looking for critical cases, researchers should look for contexts or populations which are the most likely or least likely "to either clearly confirm or irrefutably falsify propositions and hypotheses" (p. 307). Given the goals and purpose of the IGERT program, as well as the fact that the workshops occurred during the socialization phase of group formation and all group members are starting the program together at the same time, IGERT Toolbox workshops represent contexts which are most likely to reveal

socialization practices, identity negotiation, and constructive conflict in action, with potential implications for emotion in collaboration, as well as best practices in interdisciplinary collaboration as a whole.

The data for this study include the transcript, audio recording, facilitator notes, speaking turn documentation, demographic profiles, and completed Toolbox Instruments from before and after each of the ten workshops described below. All ten of these workshops were conducted with IGERT students, included the full 90-120 minute Toolbox workshop, addressed the general “Science” version of the Toolbox Instrument (as opposed to the Climate Change, Health, Climate Policy, or Science Virtues versions), and allowed for comparison across participants who answered the same 33 prompts. Audio files were either transcribed by an observer who accompanied the facilitator and recorded speaking turns or an associate working on the grant, either a graduate student or a post-doctoral researcher. I quality checked all ten of the IGERT transcripts and reformatted the transcripts when necessary for consistency. I analyzed 306 pages of single-spaced transcripts, along with 13 hours of audio recording from the IGERT workshops.

The Toolbox Instrument includes a demographic profile box which asks participants to fill out the following information: gender, career phase, number of years spent participating in inter- or cross-disciplinary activities, and up to four disciplines the participant would describe as his/her primary identity. In total, my data set included 63 participants, 26 of whom identified as female and 37 of whom identified as male. The vast majority (44) of participants indicated being in an “Early” career phase (1-7 years),

followed by 11 designating a “Mid” career phase (8-20 years), and eight categorizing themselves as being in a “Late” career phase (20+ years). The average time spent participating in inter- or cross-disciplinary activities was 2.74 years for early career phase participants, 11.18 years for mid-career phase participants, and 19.63 years for late career phase participants. Once duplicates were removed from the list of disciplines participants listed to describe their primary identity, 100 unique disciplines remained, the most common being ecology (14), followed by entomology (8), biology (6), genetics (5), and sociology (4). The four main project focus areas for these ten IGERTs are environmental change, agricultural technologies and engineering, resilience, and genetic engineering. Institutions sponsoring the ten IGERT programs analyzed here spanned the Pacific, Western, and Eastern regions of the United States.

Michigan State University houses the primary application for ethical conduct of research including human subjects within the Toolbox Project. I applied to my university’s Institutional Review Board as an external consultant to the Toolbox Project, in addition to filing paperwork and creating an account with the Michigan State University office of Responsible Conduct of Research and Scholarship. Once approved at both universities, I coordinated data management with the Toolbox grant’s principal investigator and received open access to the data listed above.

### **Action-Implicative Discourse Analysis**

Though the Toolbox Project is “a social scientific research effort that examines communication in collaborative [cross-disciplinary research] through the lens of team-based, cross-disciplinary dialogue” (Williams et al., 2013, p. 1778), there have been no

explicitly communication-based analyses conducted on the workshop data gathered thus far. In addition, the purpose of the Toolbox workshops is to identify areas of disagreement between collaborators and create a space for IGERT groups to better understand and appreciate the diverse perspectives present in their collaboration. As a result, the Toolbox Project aims to yield greater self-awareness and mutual understanding among and between IGERT students, with the eventual goal of improved communication across disciplinary boundaries. Thus, there are practical, communication-related outcomes in Toolbox workshops. By participating in a Toolbox workshop at the outset of a collaboration, IGERT students can not only begin to understand the implications of how they convey their disciplinary assumptions to diverse group members, but also improve upon that conveyance after the Toolbox is over. Because the transmission of disciplinary assumptions and identity within the Toolbox workshops occurs through communicative interactions, and because the eventual goal of the workshops is improved communication practices regarding an individual's expression of his or her research orientation, beliefs, and disciplinary identity, I propose the use of action-implicative discourse analysis to analyze the IGERT Toolbox transcripts.

Action-implicative discourse analysis (Tracy, 1995) adopts the analytic approach of discourse analysis, which is characterized by careful study and close reading of recorded and transcribed talk and text, using data exemplars and excerpts to support scholarly claims and arguments (Tracy & Craig, 2010). In addition to close analysis of participants' word choice and utterances, AIDA also assumes the goal of improved, reflective, self-aware communication practices among participants (Tracy & Ashcraft,

2001) which characterizes grounded practical theory (Craig & Tracy, 2014), another “parent” of AIDA (Tracy, 1995). In 2014, the *Journal of Applied Communication Research* introduced a special issue on grounded practical theory, highlighting the theory’s phronetic approach to recommending improved communication practices between physicians and Type 2 diabetes patients (Koenig et al., 2014), cross-cultural, multilingual healthcare providers (Bloom, 2014), collegiate instructors and students in the classroom (Muller, 2014), and governmental and non-governmental representatives at public hearings addressing controversial issues (Tracy & Hughes, 2014). Each of these featured articles focuses on communication practices and interactions between dissimilar communities, cultures, or social groups. Likewise, the IGERT groups under analysis here are comprised of students from diverse disciplinary backgrounds and training traditions.

AIDA is best described as “the coming together of two traditions: practical theory, an approach developed in the field of communication, and discourse analysis as it is practiced in the multidisciplinary community” (Tracy & Craig, 2010, p. 147). Through close reading and analysis, AIDA attempts to reconstruct a communicative practice at three levels. These include 1) the problem level, which describes communication problems or dilemmas found in any important communication practice, 2) the technical level, which sheds light on the strategies and tactics used by participants in the context of those dilemmas, and 3) the philosophical level, which reflects the situated ideals of the interaction in question. Situated ideals reflect taken for granted beliefs held by people which shape the ways in which they think they should behave and act in certain situations (Craig & Tracy, 2010; Tracy, 1995; Tracy & Ashcraft, 2001). For example, students from



disciplines or departments with strict, rigid hierarchies may communicate in ways which support stratification of power based upon career phase when confronted with new, diverse team members, whereas students from disciplines or departments which support more horizontal flows of influence and information enact a more informal conversational style when meeting new group members for the first time.

Lastly, in accordance with its roots in grounded practical theory, AIDA conceptualizes how communicative practices can be conducted in the future, encouraging self-reflection on the part of the participants under study, as well as researchers and audiences with whom a study resonates (Tracy & Ashcraft, 2001). Given the potential for conflict between research perspectives and disciplinary cultures of IGERT students, and because the data set under consideration here includes turn-by-turn transcripts with identifiable speakers and demographic information about all of the participants, an analysis of the IGERT Toolbox transcripts guided by AIDA has the potential to inform three communities about interdisciplinary communication practices: IGERT students and their faculty advisors, Toolbox facilitators, and communication scholars interested in the phronetic application of AIDA, particularly in interdisciplinary contexts.

### **Coding Process/Analytic Procedures**

The first step in analyzing discursive practices is to audio- or videotape the interaction, and then transcribe the interaction(s) under study (Tracy, 1995). Because the IGERT workshops analyzed here were conducted as part of the Toolbox Project during the time period 2009-2013, the audio files were already transcribed with participants' speaking turns designated by a number assigned at the workshop. However, to engage in

data immersion and develop extended knowledge of participants' practices in the workshops (Tracy & Craig, 2010), I quality-checked each transcript, listening in detail and correcting the existing transcript to more accurately reflect words and utterances as they unfolded in the audio account. In particular, I listened for nonverbal expressions of emotion such as individual and group laughter, raised voices, and/or crying, and edited the transcripts to appropriately reflect these utterances. I also made sure to accurately transcribe interactions when participants were talking over one another, interrupting, and mimicking each other's language. While I listened, I took notes and wrote memos to myself about patterns emerging in the data and possible codes to include in my codebook, engaging in prospective conjecture (Tracy, 2013) about what I was hearing and how it might connect up to things I had read in the past about collaboration and interdisciplinary teams.

Once I had quality checked the transcripts, I uploaded my 306 pages of transcripts into NVivo 11, a data analysis platform which stores and organizes qualitative data such as text, images, audio files, and video, and began to code my data. In qualitative research, "coding" refers to "labeling and systematizing the data" (Tracy, 2013, p. 186). The themes and patterns I noticed during my quality check of the transcripts became a "start list" of codes (i.e. laughter, jokes, paraphrasing, asking questions) which helped me tie my evolving research questions about emotion displays within the Toolbox directly to the data (Miles & Huberman, 1994). Because I was primarily interested in identity negotiation and communication interactions related to emotion, I began my analysis by

flagging all nonverbal displays of emotion<sup>1</sup> in the form of laughter, both at the individual and group levels. Both individual and group laughter appeared in all ten IGERT transcripts. However, I was not just interested in the frequency of laughter. Following AIDA, I wanted to reconstruct and understand what was happening in the context of the group laughter as a communicative practice, whether or not that context was problematic, and the situated ideals which were upheld by engaging in group laughter. AIDA's second step requires that researchers analyze discourse segments iteratively, so I compared my repeated listening and reading of the transcripts to ongoing literature searches related to themes I noticed in the data in an attempt to challenge or extend theorizing (Tracy, 1995).

I coded 161 instances of individual laughter episodes, where a participant laughs alone during or in place of their speaking turn, and 263 instances of “group laughter episodes,” when speaking ceased and the group shared a laugh together. Because I want to better understand and reconstruct how the diverse IGERT groups shared and experienced emotions together, I chose to focus my laughter analysis on the 263 episodes of group laughter. However, my coding of group laughter episodes only gave me episodic frequency. Within NVivo 11 I had only labeled and filtered the text “(GROUP LAUGHTER)” into this code, and now needed to go back into the data and examine the context within which the group laughter episode happened. For each instance of group laughter, I traced the speaking turn sequence from its beginning, when a topic shifted or when the group moved on to the next Toolbox prompt for discussion, to its end, when the

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<sup>1</sup> I conducted an auxiliary analysis where I coded for verbal ascription of emotion in the form of “I feel/felt” statements. For coding procedures and findings for the “I feel/felt” auxiliary analysis, see Appendix A.

group moved on to a new topic or Toolbox prompt. AIDA studies typically analyze long stretches of interaction because of the attention paid to wording, speech acts, arguments, or story organizations. For this reason, AIDA analyses “give limited attention to timing and prosody” (Tracy & Craig, 2010, p. 150). Rather than measure specific time spent on certain topics or the length of each participant’s speaking turn, I sought to contextualize the group laughter episode within the communicative exchanges (speaking turns) around it. Thus, though I had counted and coded 263 instances of “group laughter episode” within the transcripts, I ended up coding 187 “group laughter sequences,” many of which included more than one group laughter episode during the course of the speaking turn sequence.

As I read through the group laughter sequences, I looked for patterns both leading up to and following the group laughter episodes. One communicative practice I noticed immediately was “othering.” I created a code for “othering” in my codebook and placed into it any instance within the group laughter sequences when a participant or participants referred to or constructed an idea, discipline, person, or community as separate or apart from another idea, discipline, person, or community. After this round of coding, I ran a matrix query in NVivo 11 and found 66 items cross-coded between group laughter sequence and othering. Unfamiliar with literature and research around the practice of othering, I conducted a search to find other studies which explicitly examined “othering” and found a number of articles on the subject. The definition I found which most closely reflected my own code was that of Grove and Zwi (2006), where “‘othering’ defines and secures one’s own identity by distancing and stigmatising an(other)” (p. 1933). Within

my code, I did not appropriate the critical discourse analytic framework inherent in many of the “othering” articles I found, which examined the use of discursive strategies to create or emphasize institutions of power.

Wanting to dig a little deeper and further clarify the practice of “othering” within the IGERT workshops, I opened the 66 query items and read through them several times, again looking for emergent themes and patterns of interaction. While participants engaged in “othering” in ways which supported previous conceptualizations such as that defined by Grove and Zwi (2006), I did not interpret IGERT participants’ othering tactics as meant to “reinforce and reproduce positions of domination and subordination” (Johnson et al., 2004, p. 253), as identified in critical discourse analysis pieces. Upon further reading, I noticed two predominant communicative practices within this data subset.

Participants engaged in what I refer to as difference-based othering in every single IGERT workshop, totaling 23 times within the 66 cross-coded instances of othering and group laughter sequences. That is, participants purposefully and strategically distanced themselves from an idea, discipline, person, or community, particularly through the use of second person pronouns such as you, they, their, you guys, and you all (i.e. “How do social scientists...do y’all just say, ‘Ok, our guy’s going into this. I want to promote collaboration between environmental groups and private landowners, and that’s my bias,’ or what?”). However, I also coded 17 instances of what I refer to as sameness-based othering within the 66 cross-coded instances, where individual participants purposefully sought to “other” themselves from their group members by describing themselves as

distinct or unique by virtue of aligning with an idea or research project, as well as membership in a discipline or community, particularly through the use of first person and collective pronouns such as I, we, our, and us (i.e. “Here I am being kind of the ecologist that I am, thinking, like, there’s some value in it just being for the natural aspect of understanding the system”). Like difference-based othering, this sameness-based othering also occurred in all ten IGERT workshops and coincided with sequences characterized by group laughter episodes.

Though I did come to the data with the frame of examining nonverbal emotional displays, I did not begin analysis with a plan for an examining students’ discursive negotiation of identity. By using a grounded analysis approach, guided by the tenets of AIDA, and engaging in iterative analysis, comparing what I saw in the data to current literature, I found the following insights to IGERT students’ communicative practices related to identity in Toolbox workshops.

## FINDINGS

The findings presented here focus on instances of group laughter within graduate student workshops, as well as the speaking turns leading up to and following the laughter episodes. Analysis of the speaking turns and communicative practices of participants in the context of group laughter episodes revealed students’ use of humor and laughter to engage in “othering,” a practice by which students either distanced themselves from or aligned with ideas, people, and research values. Each of the 33 Toolbox prompts reflect different research assumptions which comprise a scientist’s researcher identity, or how they conceive of themselves in relation to their peers. These facets are divided into six

categories, according to the Toolbox—Motivation, Methodology, Confirmation, Reality, Reductionism, and Values. A student’s stance on one or more of these components of research reflects who he or she is as a scientist in relation to his or her group members. When students engage in group laughter during Toolbox discussions, they often laugh, among other reasons, in response to the group’s attempt to negotiate and understand the different identities represented in their group. Humor and laughter serve two predominant purposes: unification and division (Meyer, 2000). Through jokes, humorous comments, sarcasm, and laughter, students engaged in three primary forms of othering: 1) unifying the entire group against people outside the group, 2) differentiating group members against each other, and 3) differentiating oneself in comparison to the rest of the group. After providing and interpreting two exemplars for each of these practices, I use action-implicative discourse analysis to reconstruct these communicative practices at three levels—problem, technical, and philosophical—and explore the implications of group laughter and humor as sites of “othering” discursive strategies in graduate students’ efforts to negotiate identity.

### **Group Differentiation through Unifying Laughter**

In this exchange from Session One, the group is discussing the following prompt from the Reality section of the Toolbox: “Scientific research aims to identify facts about a world independent of the investigators.” Participant Two, who indicated a neutral score, has just initiated the ensuing interaction by saying, “...you can’t really [separate scientists from scientific research]. Right?” Participants One and Three agree that

scientists cannot ultimately separate themselves from their research, at which point

Participant Five enters the exchange (emphasis added):

(Excerpt 1, Session One)

P5: Yeah, but you can't be a, I mean, you're not going to trust the work of a scientist that says, "Well, I'm setting out to prove that global warming is not problem." As opposed to one that's saying, "I'm setting out to see if global warm..." you know, like...

P1: But there are scientists like that.

P5: *There are. But we make fun of them.*

(GROUP LAUGHTER)

In this excerpt, the group laughter episode follows Participant Five's comment, "But we make fun of them," a remark which mirrors and builds off of Participant One's observation of some scientists being inseparable from their research ("But there are scientists like that"). Within this exchange, Participant Five makes three discursive moves to unify the group through his joke and the shared laughter which follows it. First, he mirrors One's sentence structure, affording him shared credit for laying the structural groundwork. Second, Participant Five uses the pronoun "we" to separate his group from "them," scientists who cannot separate themselves from their research. His inclusive use of "we" unites the group together in a particular kind of shared identity in which each individual group member also purports to be the kind of scientist who separates him- or herself from his or her research. The shared group laughter episode which follows Five's joke confirms its veracity, implicating everyone who laughs as subscribing to this preferred identity. Third, the content of the joke itself is an explicit form of othering. It is not enough that the group in Session One disagree with scientists who cannot separate themselves from their research. By making these scientists an object of derision and scorn, Participant Five makes such people the subject of mockery and contempt by



literally “mak[ing] fun of” them, further distancing himself and his group members from such a laughable scientific identity.

Rather than group members shying away from Participant Five’s joke and refusing to confirm its accuracy through silence or vocalized opposition, his group members join him in laughter. By engaging in laughter together, group members in Session One take a small step closer to forming an identity which reflects their collective values regarding scientific research. Participant Five proposes an example of the kind of scientist as “them,” a community which is separate and apart from his own group. When Participant One argues the existence and reality of such a community and thereby threatens Five’s example, Five agrees and yet he amplifies the conversational tone to reassert his own stance regarding values in science, creating a context for shared laughter to bond the group together and begin socializing each other in regard to values the group may uphold as it conducts its own future research.

In Excerpt 2, Session Four participants are discussing the Motivation section of the Toolbox, specifically the prompt “The importance of our project stems from its applied aspects.” The students have each discussed and shared their viewpoints on the subject, with the consensus being that their program’s research project should ultimately have an applied purpose to register impact on its relevant communities. After her other group members share that they strongly agreed with the prompt, scoring “5” on their Likert scales, Participant One shares her score (emphasis added):

(Excerpt 2, Session Four)

P1: I agreed, but with a “4” (laugh).

P3: What was your reservation?

P1: I just have to say that I am a very unpolarized person. I hardly ever answer 5 or 1, like I’ll hardly ever strongly agree with a statement, or strongly disagree with a statement. I would say, you know, our project is obviously already, that we’ve been discussing about, going to have some really important applied aspects, but here I am being kind of the ecologist that I am, thinking like there’s some value in it just being for the natural aspect of understanding the system.

P2: Yeah, again, *we already discussed how we all feel different about that.* Like, it’s got to be useful for something!  
(GROUP LAUGHTER)

In the speaking turns preceding Excerpt 2, the group debates its different interpretations of the Toolbox prompts’ phrasing and agree that the purpose of the workshop is to discuss each group member’s orientation toward research, rather than getting bogged down in debating terminology. However, Participant One starts Excerpt 2 by admitting that she did not strongly agree with the prompt, differentiating herself from her group members. She explains this difference with several broken sentence fragments and ultimately calls upon her disciplinary training in ecology as a reason why she thinks “there’s some value in [research] just being for the natural aspect of understanding the system,” referring back to the group’s basic versus applied aspects of research exchange which preceded the excerpt. In response to her retreat back into her disciplinary identity (“being the ecologist that I am”), Participant Two uses the collective pronoun “we” to bring the conversation back to the group level, reminding the everyone, “we already discussed how we all feel differently about that,” where “that” is the difference between basic and applied inquiry. However, the group members did all agree that their research project should have applied research aspects, which Participant Two reminds everyone

with his emphatic restatement of his group's previously agreed-upon belief that their research project has "got to be useful for something!" This comment instigates a group laughter episode which unites the group before it moves on to discussing prompts in the Methodology section.

Similar to Participant Five in Excerpt 1, Participant Two instigates the group's shared laughter episode following another member's description of herself which is in contrast to the group's seemingly agreed upon consensus regarding the facet of researcher identity under consideration. In the discussion leading up to Excerpt 2, group members had agreed upon their values in regard to the importance of applied research. However, when she shares her score, Participant One downgraded the degree of her commitment to the value of applied aspects of research with a score of "agree" instead of "strongly agree" and attributed her score to her disciplinary training as an ecologist. Participant Two's humorous comment brings the group back to common ground through his use of the pronoun "we" and in the episode of group laughter which follows it, thus reaffirming the collective identity which was temporarily threatened by Participant One.

### **Jokes Othering Group Members' Identities**

Students did not limit the use of "othering" humor to abstract, third-party scientists or hypothetical examples. The second form of othering occurred when group laughter episodes resulted from participants' use of humor to differentiate themselves from the ideas, opinions, and/or values of specific and often named group members, as can be seen in the following exemplars from Sessions Three and Ten. While discussing the following prompt in the Reality section during Session Three, "Models invariably

produce a distorted view of objective reality,” Participant Four questions whether there is such a thing as objective reality, prompting an episode of group laughter, followed by this exchange (emphasis added):

(Excerpt 3, Session Three)

P2: That’s what I think the value of that question is, just to start talking about the idea of what a model is and as we’re together I thought about the conceptual framework too, that each of us had our own thing at the center of the universe. *And knowingly we all said, and we were making fun of [P1], “Well, of course water’s the center of the universe!” Why not?*  
(GROUP LAUGHTER)

P2: And of course people are the most important thing.

The subject of Participant Two’s joke is Participant One, a watershed management and hydrology graduate student. The joke is in reference to an activity the group did prior to the Toolbox where they created different models which reflected their view of reality. When Participant Two references a joke made during the previous activity, she uses the pronoun “we” to allocate responsibility and ownership of the joke to the entire group (“we all said, we were making fun of [Participant One]”), a discursive move which positions the entire group against Participant One and casts One’s realm of expertise and researcher identity as separate and distinct from that of the group. The group laughs together after this comment, suspending conversation to share an emotional experience. After the group laughter resulting from Two’s retelling of the joke, she adds a clarification and value-based correction of the nature of the center of the universe (“And of course people are the most important thing”) which further distances Participant One’s disciplinary identity, particularly through Two’s phrasing of her counterargument as obvious (“of course”).

This exemplar reveals a discursive strategy which served to “other” discordant group member identities in the wake of a group laughter episode. After group members laughed together following a humorous remark, the joke teller would follow the laughter with an amplifying comment which strengthened his or her stance on the Toolbox prompt at hand. Riding the wave of group laughter from her joke about Participant One’s disciplinary training of “water’s the center of the universe,” Participant Two provides the antithesis of Participant One, arguing for the ideal research identity of one who puts people at the center of the universe. This pattern of joke/group laughter/follow up joke emerged throughout the data as participants paired the deceptively lighthearted nature of shared group laughter with a successive statement which evaluated and passed judgement on a facet of a group member’s research identity, as reflected in his or her stance on one of the Toolbox prompts. Another exemplar of this strategy occurred in Session Ten.

In Session Ten, the group finds itself debating whether “Validation of evidence requires replication,” a prompt within the Confirmation section of the Toolbox. Participant Two, a history and stream ecology scientist, remarks that in his time working in interdisciplinary and multidisciplinary fields, the closest he has felt in terms of methods and analysis have been with ecology and the natural sciences, mostly because of what counts as evidence and what the goal of the research is. He reflects on this comparison, leading into the following exchange (emphasis added):

(Excerpt 4, Session Ten)

P2: So, so I find that very interesting, too, that, where we might imagine we have close disciplinary ties. For example, historians often define themselves as social scientists – I think [P3] does.

P3: Yeah, yeah.

P2: So am I a humanist or am I a social scientist?

P3: Yeah, we're sort of like a hybrid in between. So in ecology they sound really familiar, like I said, you know, because they deal, too, with multiple scales and messiness and that kind of inherent unpredictability. *You know, like the questions about replication for validity – oh no!*

(GROUP LAUGHTER)

Yeah, I'm going to use "consilience." I mean, I'm going to want things from all kinds of different avenues that come in with the same answer because *I'm not expecting to replicate, but you know [P13] would die in her lab if she couldn't replicate.*

The shared group laughter in this exchange follows an explicit discussion of disciplinary identity, where Participant Two is negotiating which disciplines he considers similar to his own and which ones he considers "other" or apart from himself. He invites Participant Three, a fellow historian, to comment on his disciplinary identity, giving Three two options: humanist or social scientist. In his response, Participant Three changes his pronoun usage from "I" to "we," referring to both himself and Participant Two as a collective ("...we're sort of like a hybrid in between"). He then turns the conversation back to the prompt addressing replication and makes it the subject of humorous critique, from the perspective of a humanist/social scientist, a comment which causes a group laughter episode. After the laughter passes he pushes on, claiming an alternative to replication with a term germane to his own expertise and prefacing it with a vocal filler to transition the group from laughter back to the exchange ("Yeah, I'm going to use 'consilience'") before turning his attention to Participant Thirteen, a molecular genetics researcher with the opposite researcher identity in regard to replication. He casts her as a humorous foil, her commitment to and value of replication as a requirement to validity so strong that she "would die in her lab" if she were unable to replicate her results. Such a seemingly extreme stance on replication casts Thirteen in sharp relief compared to other

group members such as Two and Three, particularly following the group laughter episode which resulted from Three's sarcastic mockery of replication.

In Excerpts 3 and 4, both Participants Two and Three, respectively, fulfilled a discursive pattern of joke/group laughter/follow up comment which served to 1) demarcate an initial boundary around the speaker's preferred identity in regard to specific research values, 2) draw laughter from the group and render them complicit in either the authenticity or falsifiability of the given identity, and 3) clarify and confirm the ideal facet of researcher identity under consideration. In addition to group members capitalizing on shared group laughter as sites to "other" and more explicitly outline value expectations of fellow group members, students also made themselves the subject of humorous critique.

### **Self-Based Jokes Reinforce Individuals' Identities**

Throughout the workshops, group laughter served as a collective experience during or after interactions in which a participant purposely differentiated or "othered" him- or herself from another individual, idea, or community of people, whether the individual was a present group member or the community represented an entire discipline. In these cases, rather than treating the locus of difference as external to themselves or the group, participants framed their individual nature as the point of difference, citing their approach to research, past work, or disciplinary background as unique or different from another and presenting a particular kind of identity to the group. In the following excerpt from Session Five, the group discusses the core question from the Methods section of the Toolbox: "What methods do you employ in your disciplinary

research (e.g. experimental, case study, observational, modeling)?” After some discussion about the difference between research guided by hypotheses and exploratory research, Participant Four specifically directs the conversation to prompts nine (“In my disciplinary research, I employ primarily experimental methods”) and ten (“In my disciplinary research, I employ primarily observational methods”) (emphasis added):

(Excerpt 5, Session Five)

P4: I was curious, like I know in nine and ten, I don’t use experimental and haven’t used experimental methods. I think much of ecology wishes it could use experimental methods but can’t. So, it’s funny because you can be so into the scientific method, but really in ecology you don’t do experiments unless you have a really unusual situation.

P3: Because you’re in the field?

P4: Yeah, so like some people have these opportunities to research maybe an area where there’s been a big burn and there hasn’t, so it’s like quasi-experimental. They can look at it as, “Oh, it’s an experiment, we burned this part and this is the control,” but overall, like *my master’s work for example*, it was observational. *I went out and tried to figure out what was happening with the birds in the forest. I didn’t kill half of them and see what happened.*

(GROUP LAUGHTER)

P4: So it really is observational in that sense, and I think a lot of ecology is.

Participant Four invites the exchange in Excerpt 5 by making a specific request to redirect the conversation to prompts about which she is firm in her researcher identity. She creates a context for possible follow-up questions regarding methods in ecology, stating that such methods are unused “unless you have a really unusual situation” and has an example ready when Participant Three asks for clarification. The example she cites is directly related to her master’s research as an ecologist, further showcases her disciplinary background, and culminates in a humorous, hyperbolic comment about attempting experiments when studying birds in ecology (“I didn’t kill half of them and see what happened”). The exaggeration of her last statement juxtaposes the acceptable



behavior and identity of an ecologist who observes the natural world and does not influence the environment or kill birds for the sake of research (an identity with which Four aligns herself) against the identity of an ecologist who would manipulate environmental components to run experiments and study their outcomes. Putting these two identities in contradiction with each other instigates a shared group laughter episode, where the group laughs at the absurdity of killing birds in the forest to study ecological impacts, rendering such a researcher identity as unacceptable within the group. By making herself the subject of humorous critique, Participant Four not only confirms her identity as an observational ecologist, she also asserts a value statement regarding the relationship between experiments and animals in the wild and frames her identity as supporting the general trend in her discipline. Thus, her willingness to temporarily sacrifice her individual pride and target herself through humor enables her to make larger claims about her discipline and advertise her role and identity within the group.

Whereas Participant Four in Excerpt 5 uses self-directed humor to distinguish her disciplinary identity from other group members, another form of self-othering in the context of group laughter sequences occurred when participants explicitly cast themselves as the embodied, sole representative of their discipline within the context of the group. In Excerpt 6, the group discusses the use of quantitative and qualitative methods as part of the Method section of the Toolbox. After Participant Three argues, “Quantitative takes priority. I don’t see a real use for qualitative now that we’ve defined what that is,” Participants Two and Four begin a back and forth exchange about the value

of qualitative research, as compared to quantitative. The interaction culminates in the following speaking turns (emphasis added):

(Excerpt 6, Session Seven)

- P4: One of the beauties of qualitative, though, is like if you were writing your social thing. Instead of categorizing that one through five, you have people's direct quotes. Sometimes that's powerful when you read that. This guy says this. You're like, "Wow, I never thought of that." This means this to me. There's a role there that it plays that quantitative can't. A lot of people look at the numbers and just gloss over it.
- P2: And in your discipline, you think there's a place for that?
- P4: *I guess in my discipline, now I'm supposed to be a plant ecologist, right?*  
(GROUP LAUGHTER)
- P4: I think so. One of the beauties of ecology is like photographs and taking beautiful photographs. People see that. "Wow, we've got to preserve that." That's almost like qualitative.
- P2: That's a good example, photography. I like that.

Similar to Excerpt 5, the group laughter in Excerpt 6 follows a self-directed joke and heralds a joke teller's further differentiation of himself from the group. Excerpt 6 begins with Participant Four describing the "beauties" of qualitative research and asserting its value to his group, only to have Participant Two challenge him. However, Participant Two is not just asking for clarification from Four as a researcher. Two is simultaneously casting Four as a representative of plant ecology who can speak to the place of qualitative methods in his discipline, as well as "othering" him through the use of second-person pronouns in his question ("in your discipline, you think there's a place for that?"). Participant Four accepts the invitation to speak on behalf of his discipline, albeit through a self-directed, humorous joke which is framed as a question and includes qualifying verbs and phrases such as "I guess in my discipline" and "I'm supposed to be the plant ecologist, right?" These discursive strategies serve to elevate Four's researcher identity within the group by acknowledging his disciplinary background while also highlighting

his hesitancy to speak on behalf of his discipline. His framing and delivery of this acknowledgement and hesitancy culminate in a shared group laughter episode which temporarily unites the group around the experience of being a disciplinary member on a team and being called to speak for that discipline. Four's use of discursive strategies which allow him to express his hesitancy while also retaining control of the exchange resonates with his group members, who laugh along with him. Similar to Excerpt 5, Participant Four leverages the shared group laughter episode and uses it to his advantage, further defining the field of ecology and its use of qualitative methods. When the laughter is over, he takes another speaking turn and describes again the value of qualitative research, using the time and attention of his peers to share another "one of the beauties of ecology," realigning himself and his researcher identity with that of his home discipline.

Excerpts 5 and 6 demonstrate how a student could build off of his or her own self-directed joke and capitalize on the group's laughter and attention to both advance his or her own individual research identity and broader inferences about his or her home discipline. This is a different use of humor than Excerpts 3 and 4, in which group laughter episodes created a context where group members directly compared their researcher identities to others within the workshop. Group laughter episodes also revealed a third mode of othering through humor, in which group members shared a laughter experience at the expense of a researcher identity which was external to, or unrepresented, within the group itself, as seen in Excerpts 1 and 2. Even as students used discursive strategies to "other" conflicting identities and orientations toward research, the group laughter

episodes in which these strategies occurred served to unite them, however briefly, in a shared communicative experience.

### **Reconstructing Communication at Problem, Technical, & Philosophical Levels**

This analysis of Toolbox workshops suggests that graduate students engage in “othering” as a discursive strategy when negotiating their identity in interdisciplinary contexts. Examining these findings through the lens of AIDA enhances our understanding of communicative practices within the Toolbox workshops at three interrelated, conceptual levels: problem, technical, and philosophical (Craig & Tracy, 2014; Tracy, 1995; Tracy & Craig, 2010). The problem level of reconstruction represents an entry point for analysis guided by grounded practical theory, which serves as a tenet of AIDA. This level of analysis identifies the problems, tensions, and/or dilemmas facing participants which can be found in almost any communicative practice (Tracy & Craig, 2010; Craig & Tracy, 2014). Once analysis reveals the problematic tensions within a context, further examination can break down the concrete, specific strategies or discursive moves used by participants to manage those tensions (technical level), and identify the situated ideals, or beliefs about what constitutes good or appropriate behavior, which guide discursive choices in the given context (philosophical level).

### **Problematic Communicative Practices: Negotiating Identity in Collaboration**

Research groups experience a well-known development phase referred to as “forming” (Bonebright, 2010; Tuckman, 1965), a time at the beginning of a group’s lifespan when members are socializing and orienting themselves toward one another and the project at hand, establish relationships, set organizational standards, and test

boundaries for interpersonal communication behaviors. The experience of “forming” among group members is phenomenon shared by interdisciplinary groups in widespread contexts, cultures, and circumstances. O’Rourke and Crowley (2013), two creators of the Toolbox, argue that the challenges facing interdisciplinary collaborators “are, crucially, *communication* challenges” (p. 1938 [emphasis in the original]). Such communication challenges involve group members working together with representatives of other disciplines, sharing perspectives and knowledge, and attempting to forge a “collaborative identity.” A member must negotiate his or her individual identity as a disciplinary representative, even as he or she contributes toward the creation of a unified whole.

In interdisciplinary collaboration, the combination of individuals with diverse areas of expertise, disciplinary culture, and educational training creates a space ripe with the potential for conflict, but not all conflict is negative or has negative consequences. Constructive conflict occurs when stakeholders share and confront each other’s ideas to not only learn about the diversity of possible perspectives, but also develop or adjust organizational strategies (Ligtvoet et al., 2016). However, the notion of constructive conflict centers on participants’ ability and willingness to not only express and translate their opinions and arguments to others, but also own and take responsibility for their viewpoint. Thus, while constructive conflict can be a healthy, productive development opportunity for groups, a number of factors prevent its success, including, but not limited to, participants’ inclination to avoid confrontation, inability to clearly express ideas, preference for group cohesion, and desire to present their preferred identity. The Toolbox

Project and the IGERT program are two sites where individuals must learn to negotiate the interplay of their researcher identity with those of fellow group members.

### **Philosophical Underpinnings: The Toolbox and IGERT**

Both the Toolbox Project, which grew out of an IGERT program and was funded by a grant from the National Science Foundation, and IGERT programs in general, which are funded by the National Science Foundation, believe that disciplinary diversity in groups and networks can help solve large and complex research problems of scientific and societal importance. Given their value of and commitment to collaboration, both research programs seek to improve the success of interdisciplinary work. The Toolbox workshops advertise the ability to “enable cross-disciplinary collaborators to engage in structured dialogue” with the goal to “[yield] both self-awareness and mutual understanding” ([www.toolbox-project.org](http://www.toolbox-project.org)). The mission of IGERT programs “[provide] students with the tools to become leaders in the science and engineering of the future” ([www.igert.org](http://www.igert.org)) by creating graduate education experiences which organize disciplinarily diverse students around a common topic or problem. Layering these two value systems on top of one another creates a sense of situated ideals and expectations for behavior within the context of IGERT group members in Toolbox workshops. In this context, collaborative, team-oriented students demonstrate active listening, engage in conflict resolution through principled negotiation, collaborate across disciplinary boundaries (Vinhateiro et al., 2012), acknowledge and embrace uncertainty, recognize and appreciate others’ expertise, discuss and contribute new thoughts and ideas to the group, translate

and share their knowledge, and successfully integrate themselves into new groups, networks, and communities.

### **Technical Moves and Discursive Strategies: Laughter as a Site for Othering**

While there are numerous discursive strategies used by graduate students and scientists to negotiate differences in research identities and assumptions, this study focused specifically on laughter episodes and the subsequent role of laughter in identity negotiation. Analysis of group laughter shared among graduate students participating in collaborative, dialogue-based workshops revealed students' attempts to negotiate their individual, disciplinary identity while also trying to form relationships as an interdisciplinary group member. Shared group laughter episodes often resulted from a group member's joke or humorous comment, the object of which was often to "other" or differentiate a specific target. Through these jokes and humorous comments, students engaged in three primary forms of othering: 1) unifying the entire group against people outside the group, 2) differentiating group members against each other, and 3) differentiating oneself in comparison to the rest of the group. These strategies support the use of humor to both unify and divide groups, and reveal how, in the context of shared laughter, graduate students "othered" ideas, people, and communities while attempting to convey their own identities.

## **DISCUSSION AND CONTRIBUTIONS**

Action-Implicative Discourse Analysis helps researchers reconstruct communicative practices at three levels which mutually inform each other. In this analysis, the philosophical and problem levels create a more focused context for

understanding the discursive strategies which present at the technical level—group laughter as a context for identity negotiation. This analysis of shared group laughter reveals IGERT students’ repeated use of group laughter episodes as sites for othering, a strategy which served to protect a student’s identity and role within the group, as well as distance him- or herself from and frame other identities which were perceived by the individual or group as undesirable or unacceptable.

If we consider the technical level finding of laughter as a context for othering in isolation, we can create greater understanding of the communicative strategies by which graduate students differentiate themselves from others, a finding which contributes to the othering literature. Much of the previous research on discursive othering is critical in nature and seeks to expose power differentials in society among and between different groups. This study did not take a critical approach, but instead examined othering practices among individuals in peer-to-peer relationships, people who are all at the same position within the group hierarchy and who all entered the communication scene knowing what was expected of their behavior and expertise, as well as their role and relative agency within their program. This study makes an additional, methodological contribution to the othering literature by revealing the turn-by-turn process of discursive othering within the Toolbox workshops. Much of the othering literature findings are based on one-sided, asynchronous analyses of communication, either through interviews, critical literature reviews, or rhetorical analysis of documents or other texts. In contrast, the data analyzed here reflect the situated, real-time interactions which unfold before, during, and after othering strategies.



In addition, the technical level analysis connects findings from literature on othering with previous studies on the functions and purposes of humor. Whereas previous studies have assumed power differentials when studying humor in organizations, such as the use of humor by veterans to socialize newcomers to an organization or the role of humor in establishing behavior expectations between customers and employees, the horizontal hierarchy of the IGERT students examines humor as a context for othering between peers which served to both unite (Excerpts 1 and 2) and divide group members (Excerpts 3-6). Methodologically, examination of the Toolbox workshops allows researchers to investigate and trace humor in real time through the turn-by-turn transcripts, a contribution to the humor literature in organizational communication which currently relies heavily on interviews and participant observation, which can attest to a participant's intent and provide general impressions from observation but do not provide data for discursive analysis of talk and text as it unfolds in real time throughout an interaction.

However, the most significant contribution of this study comes from examining these technical level findings in light of both the philosophical and problem levels described above. The purpose of the Toolbox workshops is to open channels of dialogue and create a context for group members to share and discuss their research assumptions and orientations, with the goal of increased understanding of alternative viewpoints. In a similar vein, the goal of the IGERT programs is to train and develop interdisciplinary scientists and engineers through integrative graduate education. The population analyzed here represent a critical incident sample—out of the 178 available Toolbox workshop

data sets, I purposely chose these ten workshops because I assumed that if any transcripts were going to provide exemplars of how scientists from different fields collaborate and communicate, the ones which featured IGERT students could provide the best examples of how people who are motivated to move beyond their individual discipline and translate their knowledge to other fields do so in face-to-face interaction.

And yet, despite the philosophical ideals which should guide communicative practices of active listening, perspective taking, and openness to collaborate among IGERT students, participants in all ten workshops used group laughter episodes as opportunities to draw boundaries around, protect, and reaffirm their researcher identities. These protection strategies manifested at the group level, where humor and laughter united the group against external others (Excerpts 1 and 2), and at the individual level, where humor and laughter distanced group members' identities from each other (Excerpts 3 and 4), and enabled individuals to frame their own identities as separate and distinct from other members (Excerpts 5 and 6). As its name suggests, IGERT programs are meant to provide "Integrative Graduate Education and Research Training," and yet analysis of these ten Toolbox workshops reveal students' repeated attempts to maintain individual, disciplinary identities even within IGERT programs.

The presence of such clear othering and identity protection in the context of an integrative graduate education program is indicative of a larger, more systemic challenge facing scientists who want to engage in collaboration across multiple disciplines. Doctoral-level graduate education in science and engineering (and many other disciplines) places great emphasis on individualism in research. After taking one or two

years of coursework, students spend several years devoted to advancing their own research, often working alone or under the direct supervision of a graduate advisor. As a result, students develop within and are judged according to criteria defined by a particular field, rather than their ability to flex across multiple ways of organizing, collaborating, and pursuing research projects. Students compete to earn IGERT grants and consent to their acceptance and participation knowing the importance of integration and collaboration as key components of the program. Despite the values of integration and interdisciplinary collaboration emphasized by the program, students still struggle in their attempt to compartmentalize and draw clear lines between identities.

When interpreting these findings, there are two important factors to keep in mind regarding this study. The first is that the data set under consideration was part of the Toolbox Project which, by design, invites participants to answer Likert scales for 33 prompts and, as part of the guided workshop, share their scores and the rationale behind them. Such a structure inherently creates a situation where participants are individualizing themselves through the communication and framing of their research identit(ies). In many cases, scores match and participants are in alignment, on paper, about the extent to which they agree or disagree on a prompt. However, through the discussion of *why* participants scored prompts in a certain way, differences can still arise and require participants to create clear and rational ways of communicating their message to others. This phenomenon occurs in the opposite direction, as well, when participants score opposite on a prompt but, through dialogue, find that their viewpoints are more aligned than the scores on paper would suggest. The stated purpose of the Toolbox

workshops is to open channels of dialogue and create a context where group members can disclose and discuss their research assumptions, and the method has proven its ability to achieve these goals. However, this analysis also revealed a tendency of the workshops to serve as a practice in individuation on the part of participants, by nature of its design.

The second factor is the timing of the Toolbox workshops, which occurred in the beginning stages of graduate students' group development. Toolbox workshops are often conducted at the outset of a group project, during a stage of group development where participants are still getting to know each other and understand how their individual role and expertise fits into the larger collective. This initial group formation process is when organizational socialization occurs, a process which can determine the current and future identity of individuals in organizations and groups. During this period of socialization, students are still adjusting to their role within the group and may feel the need to present an identity which encapsulates their disciplinary training and expertise and legitimizes their presence as a group member. It is logical to assume that group members must first be aware of each other's expertise and perspectives before efforts can be made to integrate them, and that perhaps the Toolbox workshops provided a key context during the socialization phase where participants were attempting to do just that.

### IMPLICATIONS

This study highlights the role of laughter and humor as contexts of identity negotiation. Whereas existing research has examined the influence of positive affect and humor in individuals' creativity and group collaboration processes, this study revealed shared emotional experiences as contexts for identity performance and reflection. While I

did not set out to study the negotiation of identity in interdisciplinary collaboration, this pattern quickly emerged as a salient and influential experience for student collaborators. The findings presented here reveal how humor and laughter not only served as playful interludes to conversations often marked by careful contemplation and communication of philosophical research assumptions, but also created a small window of time during which participants were presented with and considered different possibilities for what was and was not an acceptable researcher identity. The emotional tone, mood, and atmosphere of shared humor and laughter emerged as a context through which collaborators tested the limits of different identities by telling jokes, sharing stories, posing hypothetical examples, and questioning taken for granted assumptions about their disciplinary identities and approaches to research.

However, the Toolbox workshops were not designed to be sites of participants' playful negotiation of self and humorous experimentation of different identities. In the workshop's current form, these are pleasant, positive byproducts of a method designed to engender cross-disciplinary dialogue about epistemology and metaphysics, grounded in philosophical analysis. Though humor and laughter are common occurrences in workshops, these communicative practices are not the intended foci of the Toolbox itself. Nevertheless, the prevalence of humor, laughter, and playful exchange within the ten workshops considered here and others within the Toolbox database exposes a previously unexplored possibility for catalyzing the change and growth of identity in interdisciplinary scientific collaboration, as well as any collaboration which includes a diverse group roster.

Future workshops, kickoff events, team retreats, and annual meetings should capitalize on the role of play, humor, and laughter in helping collaborators reflect upon and experiment with their identities. We should design playful encounters such as role playing, improvisational theater, gamification, simulation, and other serious play methods to accelerate the negotiation of identity and encourage collaborators to take part in activities and experiences which inspire them to reflect on their own tendencies to discursively “other” ideas and people, as well as experiment with a new identity or sense of self within the context of an exercise or group setting. Because shared emotional experiences are sites for potential identity (re)negotiation and transformation, playful encounters and experiments should parallel the findings presented here in regard to othering practices, putting participants in contexts which 1) unite the group around shared values and beliefs, 2) recognize members’ range of expertise and explore contexts for skill convergence, and 3) encourage reflection and self-critique.

## CONCLUSION

The purpose of this paper was to develop insights about communicative practices in interdisciplinary collaboration by examining scientists’ negotiation of identity and difference in the context of shared emotional experiences. In-depth analysis of the communicative practices at the problem, technical, and philosophical levels revealed identity management tensions faced by interdisciplinary collaborators and described discursive strategies used by graduate students to manage these tensions. This paper also demonstrated the insightful application of AIDA in identifying and understanding collaborators’ discursive strategies when negotiating (inter)disciplinary identities.

## **Limitations**

This study examined IGERT students' discursive negotiation of identity in the context of Toolbox workshops. As such, findings are limited to the sites and workshops from which these patterns emerged. The pattern of laughter and humor as contexts for identity negotiation and othering applies to the ten workshops examined here and may not generalize to all of the other Toolbox workshops. However, the goal of qualitative, interpretive inquiry is not to generalize. While these particular findings may be germane to IGERT workshops, the tensions encountered by graduate students when trying to negotiate identity in a new collaborative group are transferable to a number of other contexts, such as diverse groups in and out of the academy, interdisciplinary science groups and networks, and organizational socialization process of groups and networks, as well as other Toolbox workshops with more advanced faculty and scholars.

The findings for this study were based on transcripts, audio recording, facilitator notes, speaking turn documentation, demographic profiles, and completed Toolbox Instruments. What was not included, and which can contribute to a more holistic understanding the three-level construction of communication practices, were interviews with participants. Interviews allow for greater immersion into a particular site or communicative practice, and help researchers understand more of the motivations behind participants' discursive strategies, in their own words. In addition, I only had audio recordings from the workshops, and not video. While laughter is often the primary indicator of shared humor experiences, nonverbal gestures such as smiles, grins, or even

sudden exhalations indicate humor (Meyer, 2000), but due to the nature of the data available, I was not able to account for those communication practices.

### **Future Directions**

Future analyses of the Toolbox workshops should focus on different communication practices evident in the different workshop sections. Such an analysis can help facilitators, network leaders, and group members highlight key strategies by which interdisciplinary collaborators attend to differences regarding confirmation, methods, motivation, values, reality, and reductionism. Future analyses can also compare these communication practices to workshop participants' movement on prompts between the pre- and post-workshop distribution of the Toolbox instrument. Though gender was not a focus of the present analysis, future Toolbox analyses should compare communicative practices and movement on the pre- and post-workshop scales in light of gender and discipline.

As much as possible, future studies should seek to analyze situated, real-time data which showcases the turn-by-turn discursive strategies use by interdisciplinary collaborators as they negotiate their identity in group contexts. The use of AIDA in this study was particularly insightful in reconstructing the three levels of IGERT students' communicative practices to reveal discordance between the philosophical and technical levels. Future applied studies with intended practical outcomes should continue to broaden the use and applications of AIDA in a variety of contexts where communication practices between participants can and should be improved toward greater societal outcomes.



IGERTs and other, similar integrative graduate education programs serve as important sites for improving the future of interdisciplinary work. Though the grants fund a limited number of students each year, the application requirements set a standard for the expectation of interdisciplinary collaboration. While IGERTs and similar integrative graduate programs demonstrate integration of students in regard to coursework and project teams, the meaning of interdisciplinarity extends beyond teamwork (Borrego & Cutler, 2010) into critical awareness, appreciation, and transference of knowledge across and between interdisciplinary collaborators. Future research should examine the graduate students' conceptualization of themselves before and after integrative graduate programs, not just in terms of teamwork but as scholars who can navigate the interpersonal dynamics of interdisciplinary collaboration.

Future work should continue to examine the emotional components of identity and explore new possibilities for creating low-risk, high-reward contexts for people to experiment with and discover themselves. Identities are not static. People are dynamic, with changing interests and growing potential. However, becoming someone new and accepting an uncertain future is risky. Future research should translate our knowledge of identity negotiation, emotion, and collaboration into practical applications and solutions which can help people embrace a new sense of self and the unlimited possibilities of the future.

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APPENDIX A  
“I FEEL/FELT” STATEMENT ANALYSIS

### **“I Feel/Felt” Statement Analysis**

Whereas I limited analysis of “othering” to the context of the group laughter exchanges, I included the entire IGERT Toolbox workshop data set in my coding procedures for “I feel/felt” statements. I assumed that statements such as these could be present anywhere in the transcript, and because I rendered this category of ascribed emotion as distinct from nonverbal emotion such as laughter, I was not limited to laughter exchanges alone. In total, there were 85 instances of clearly structured “I feel/felt” structured statements. I coded these statements at both the individual speaker and within an “I feel/felt” exchange thread, similar to the group laughter exchange thread, where I traced the interaction from its beginning, when a topic shifted or when the group moved on to the next Toolbox prompt for discussion, to its end, when the group moved on to a new topic or Toolbox prompt. Once I had all of the “I feel/felt” statements coded within their group-level exchanges, I read back through all of the items to look for communicative practices, themes, and patterns of interaction.

As with the “othering” communicative practices around group laughter exchanges, I noticed a clear and immediate trend in the “I feel/felt” statements. I created this code to identify instances where IGERT students explicitly framed their emotion through speech, and it was true that some of the “I feel/felt” statements represented clear attempts by participants to express an emotion (“I feel confident about my answer, I felt strongly about that prompt”). However, expressions of emotion such as these were present in only half (5) of the IGERT workshops, and I coded them only eight times. In contrast, IGERT students overwhelmingly used “I feel/felt” statements to preface a cognitive thought or opinion communicated to the group (i.e. “I feel like the qualitative part of it is really important for developing a question and understanding context that you’re asking the question in. But it seems like most scientific papers and economics papers really emphasize quantitative methods”). I coded participants’ conveyance of opinion or argument using the preface and sentence structure “I feel/felt” in every single one of the ten IGERT Toolbox workshops at a frequency of 77 times, meaning participants followed “I feel/felt” with an opinion or argument 9.6 times more often than following “I feel/felt” with an actual emotion.

Because AIDA is an iterative process, I turned back to the literature to try and understand the communicative practice of participants' using "I feel" to frame an argument, rather than express an emotion. Social psychologists Mayer and Tormala (2010) and Holtgraves (2015) compared the influence of cognitive verbs (I think) versus affective verbs (I feel) in persuasion and self-reflection, respectively, and argued that the verbs serve as cognitive and affective cues, priming a listener to either think or feel in response to the speaker's verb usage. Conflict resolution, counseling, anger management, and bullying prevention programs all advocate the use of "I statements" to analyze and frame a situation, as well as take ownership of one's thoughts and feelings. However, my analysis suggests that IGERT students use the preface "I feel" to masquerade an opinion or argument as a feeling, distancing themselves from the potential conflict of another member's alternate opinion and reducing the chance of having to address counterarguments. A codebook example with the laughter, othering, and "I feel/felt" codes is included in Appendix B of this document.

Once I noticed this communicative practice, I wondered how I could better understand its pattern within the data through filters readily at my disposal. The creators of the Toolbox Instrument separated the 33 prompts into six main sections addressing different components of and approaches to research—Motivation, Methodology, Confirmation, Reality, Values, and Reductionism. From my quality checking and familiarity with the data, I knew that some of these sections were more ripe than others for potential conflict between IGERT members of different disciplinary training and backgrounds. I created headers for each of the six sections within NVivo and autocoded all of the content between headers, chunking the entire data set into six Toolbox sections, as well as a "Debrief" section that I added at the end of each workshop. I ran a matrix coding query to compare instances of "I feel/felt" cognitive statements and the six Toolbox sections. I ran a matrix coding query in NVivo and found that the top two Toolbox sections cross-coded with "I feel/felt" cognitive statements were Values (18) and Confirmation (17), followed by Motivation (12), Reality (11), Methods (9), and Reductionism (6). I explore further analysis of "I feel/felt" affective verb use in the Findings section.

### Use of Affective Verbs to Frame Arguments and Protect Identity

Throughout all ten of the IGERT workshops, participants engaged in verbal ascription of emotion through use of the words “I feel/felt” to frame and/or structure an emotion. In total, I coded 123 instances of participants using the verbs feel, felt, or feeling during their speaking turns. Of these 123 instances, a mere eight used the words “I feel/felt” to express an emotion or emotional state. These eight instances occurred in only half of the ten IGERT Toolbox workshops, with three of the eight explicit expressions of emotion through “I feel/felt” happening in Session Three. The most common use of verbal emotion framing transpired when participants shared their Toolbox scores, as can be seen in the three exemplars described and then discussed together below (emphasis added).

(Excerpt 7, Session Six, Lines 40-47/790)

6P4: For the second one, I wasn’t really certain. *I didn’t feel as strongly on the second one.* I kind of felt like I should disagree with that. I think that applied questions and basic questions...a basic question, later on, can become an applied question. To me, it seems like a cross disciplinary outlook could work for both of those things?

6P3: I scored it number two.

6P4: So did I.

6P3: So I agree with you, [6P4]. I also think that basic questions, like you maybe were saying, too, they build to applied questions. You have to get some basic knowledge and then you can apply that knowledge in some way and maybe in ways that you weren’t necessarily expecting or that I wouldn’t necessarily expect to begin with.

In this excerpt from Session Six, Participant Four, an early-career phase female, shares her score on the second prompt in the Motivation section of the Toolbox: “Cross-disciplinary research is better suited to addressing applied questions than basic questions.” She prefaces her “I feel” statement with a clear qualifier (“I wasn’t really certain”), follows it with a value-based judgement using the verb “felt” (“I kind of felt like I should disagree with that”), and ends her speaking turn on a claim which she turns into a question at the last second, inviting her group members to join the discussion and potentially solve her confusion. Thus, even as she says she “[doesn’t] feel as strongly”

about the prompt, it is clear that she experiences internal confusion and conflict when trying to explain her score. In response, Participant Three, the other female in the group and also an early-career phase researcher, offers her score, which matches that of Participant Four. Participant Three further expresses her alignment with Four (“So I agree with you, [6P4]”) and then paraphrases Four’s statement back to the group.

In the following excerpt from Session Two, the group is discussing the same prompt as Excerpt 7, regarding cross-disciplinary research being suited to applied questions. Participant Four, an early-career phase female researcher, initiates the interaction by paraphrasing the prompt and saying she “kind of agreed” but that she was unsure what her group members would think. Her emotional expression of confusion creates space for Participant One to express his own indecisiveness (emphasis added):

(Excerpt 8, Session Two, Lines 53-60/1267)

2P1: I was kind of in the middle in that one. *I didn’t really feel strongly one way or the other.* And, uh, which is better suited.

2P3: Yeah, I can see that point and, and I agree that complex interdisciplinary research is... you really do need, typically, you need a wide variety of disciplines to, to tackle it. But I also thought there were some basic fundamental things where cross disciplinary researchers are also more able to tackle those than, than just single disciplines, even... even very basic questions.

Similar to Excerpt 7, Participant One’s express of emotion, or disclosure of emotional ambivalence (“I didn’t really feel strongly one way or the other”), creates a space for another group member to share his or her own orientation toward the prompt. However, in Excerpt 8, Participant Three starts by agreeing with One’s emotional ambivalence, only to add a contrary conjunction (“But...”) and ends up indicating her score as being more committed to agreement with the prompt, in comparison. Participant Three indicated on her demographic profile sheet that she was a late-career phase female with roughly 20 years of experience in interdisciplinary activities, similar to Participant One, a late-career phase male who also indicated 20 years of interdisciplinary work. Both participants are speaking from their own experiences, but after 20 years working in interdisciplinary settings, Participant Three has an opinion on basic versus applied cross-disciplinary research and One does not.

In contrast to Excerpts 7 and 8, which depicted participants' emotional ambivalence regarding Toolbox scores, the following excerpt from Session Three is an example of strong verbal, emotional commitment to the last prompt within the Motivation section. After a lively, back and forth exchange between Participants Two, Three, and Four, the facilitator asks for any other thoughts on the Motivation prompt before moving to a new category. Participant Two directs the group's attention to the last prompt of the section: "The members of this team have similar views concerning the motivation core question" and asked what people "guessed." All of the group members indicated a score of four ("agree"), whereas Participant Four circled five for "strongly agree," leading to the following exchange:

(Excerpt 9, Session Three, Lines 256-262/656)

3P2: Oh you actually picked one, you didn't put "I don't know"!

(GROUP LAUGHTER)

3P2: Apparently we already touched on that issue before, so you knew!

3P4: Yeah, I did. *I felt pretty confident.*

3F: You checked a five but everyone else checked four.

(GROUP LAUGHTER)

3P2: Actually, that's great.

The last prompt of each Toolbox section asks participants to indicate the extent to which they agree or disagree that the member of the group have similar views on the given section. As such, Participant Two frames peoples' scores as a "guess" rather than a commitment to a stance on research. In the greater context of Session Three, Participant Four has clearly stated his aversion to scores at either end of the continuum ("I put four but it's just my personal, I don't do one and fives"), rendering his score of strongly agree in Excerpt 9 even more significant, once he hears that the rest of his group "guessed" four. Participant Two expresses surprise at his score, leading to a group laughter exchange and Four's expression of emotion ("I felt pretty confident"). Participant Two makes an evaluative judgement on Four's score ("Actually, that's great") before the group moves on to another topic. Excerpts 7, 8, and 9 happened during discussions about the Motivations section of the workshop. In each instance, participants' expression of an emotional state—whether ambivalence or confidence regarding a score—instigated further discussion around the prompt in question. Rather than "othering" their group

members because of their emotional confessions, the remaining IGERT members accepted the emotional disclosure as part of the collaborative process and used it to continue discussion.

In addition to framing emotions in the context of sharing Toolbox scores, IGERT students used “I feel/felt” sentence structures to communicate their emotional state in response to other members asking for additional information and clarification in regard to their experiences. During Session Ten, the group discusses the Confirmation section prompt, “Research interpretations must address uncertainty.” Participants Eleven and Thirteen, faculty members observing the workshop, jump in to share their experiences getting reviewer comments on publication submissions where they were asked to draw more attention to limitations of their research to better address uncertainty.

(Excerpt 10, Session Ten, Lines 744-756/1201)

10P14: For the students do you feel that tension?

10P13: Too early in your career to feel that tension? (Laugh)

10P12: *I think I feel it all the time ...*

10P13: Oh.

10P12: And not just in science. I mean you know we’re ... right, we’re pushed to be modest and we’re supposed to say that we’re never always right, but then when you’re presenting you’re supposed to be confident. You’re supposed to think that you have the absolute truth—

(GROUP LAUGHTER)

—and it applies to science as much as anything else, and I think it, I think it is detracting from any research. I think it is unfortunate that people can’t be strong enough to deal with the uncertainty to...and in this case, “This is the truth but it might not be.” We don’t live in an absolute world. I don’t ... I don’t see why we should have to treat it that way.

Participant Thirteen is a mid-career phase female and frames herself in a position of experience over others in the group (“Too early in your career to feel that tension?”). The fact that she follows this framing with an individual laugh further distances her from the early-career phase group members such as Participant Twelve, the female who answers Thirteen’s question with an emotional confession (“I think I feel it all the time”), prompting an expression of surprise (“Oh”). Participant Twelve continues, describing the tension she feels in her own words and posing an unrealistic ideal (“You’re supposed to think that you have the absolute truth”) and eliciting laughter from the group. In this case,



Participant Twelve is specifically invited into the conversation and asked to explain whether or not she “feels” a tension described by later-career phase group members. She confirms a feeling analogous to the more senior people in the group regarding tensions between making confident claims and addressing uncertainty, and shares her experience of that tension which resonates with the other participants, as can be seen in the shared group laughter halfway through her response.

In the following example from Session Three, Participant Two fields several questions from her group members concerning replication of results, a prompt from the Confirmation section of the Toolbox. Participant Two is the only social scientist in her group and throughout Session Three she experiences several sequences of interaction where her group members pepper her with questions, particularly concerning prompts in the Values and Methods sections. The sequence in Excerpt 11 reflects one of these exchanges with Participant Three, an early-career phase male studying fluvial geomorphology (emphasis added).

(Excerpt 11, Session Three, Lines 412-425/656)

3P3: Is there a goal in social science to find generalizations across populations or is it-

3P2: Some people, well, I would say a lot of people, just focus on that, there’s a heavy emphasis, but in the opposite end of spectrum or paradigm spectrum I’d say people try not to do that as much. For example, in the case study literature people see value for understanding what happens in one particular case. And that could be generalized, but it’s not generalized “if this then this, so here we find this, then this.” If A then B, and here we find A, so B must be true. It’s more of a, “This is how we explained this system.” It’s like the process of understanding it, and then we can apply that process, that’s how I think of it, the process to our understanding.

3P3: More methodology?

3P2: Yeah, maybe. But it’s also, without what you’ve learned the methodology doesn’t mean anything. So kind of what I did in Guatemala, I felt like this is a really good example of how we can start exploring the decision making process, and now after what I learned there *I felt like, “Woah now I want to start studying this.* This is just the beginning.” I realized that I know nothing about this and there’s not much in literature about it, so now we have this process that would be cool to apply somewhere else. Does that make sense?

Participant Two uses the verb “felt” twice in her last speaking turn during this exchange, but the second mention is of particular note here. She spends the sequence explaining how interpretive paradigms address standards of generalization (“in the opposite end of spectrum or paradigm spectrum I’d say people try not to do that as much”) but Participant Three is on the opposite end of that spectrum from her. Perhaps because of this cognitive dissonance, she resorts to an affective, rather than cognitive, appeal. When describing the importance of learning from different methodologies, she shares a personal experience where she realized her motivation for studying how people in Guatemala make policy decisions (“I felt like, ‘Woah now I want to start studying this’”) and ends the speaking turn with a clarifying question, turning the speaking turn back to Participant Three. However, Participant Four redirects the conversation onto the next prompt before Participant Three can respond to Two’s emotion disclosure.

Both of the emotional disclosures in Excerpts 10 and 11 occurred in the Confirmation section of the Toolbox. Such verbal expressions of emotion using the explicit “I feel/felt” sentence structure were rare in the data, and the two excerpts above represent one-fourth of all explicit, verbal emotion displays. Thus, the fact that they both occurred within their section’s Confirmation discussion is potentially of note, as is the fact that both speakers were female. In addition, during Session Three Participant Two is the speaker for a third emotion disclosure similar to the one in Excerpt 11, as well as the initiating speaker for Participant Four to express that he “felt pretty confident” in Excerpt 9. These four instances put Participant Two, Session Three in direct contact with half (4) of all instances (8) of verbal emotion display and/or disclosure using the “I feel/felt” affective verbs in all ten of the IGERT Toolbox workshops.

### **Framing Opinions and Arguments as Affective Experiences**

In comparison to the eight instances of IGERT students using the affective verbs “I feel/felt” to structure and frame expressions or displays of emotion, I found 77 instances of participants using these verbs to introduce an opinion or argument. I resisted the urge to label these 77 instances as purely “cognitive” because I wanted to allow for the possibility that participants might have been expressing an emotionally-laden thought or opinion. Therefore, a key distinction I made between these two groups of “I feel/felt”

statements was that in these 77 instances participants did not follow “I feel/felt” with any kind of term, word, or phrase which conveyed emotion. Instead, they used the affective verbs “feel/felt” to introduce an argument or claim which advanced the Toolbox dialogue.

An exemplary exchange demonstrating participants’ use of affective verbs to frame an argument occurred in Session One (Excerpt 12). The group is discussing the prompt “The subject of my research is a human construction,” within the Reality section of the Toolbox. Participant One, who indicated that he strongly agreed that the subject of his research was a human construction, poses an example to the group (emphasis added).

(Excerpt 12, Session One, Lines 722-744/964)

1P1: Okay but I, so like, if I’m Michael Derelli the subject of my research is... Okay say I’m the speaker yesterday. I’m studying the evolution of sex. *I feel like all of those ideas are human constructions.*

1P2: I do too.

1P4: The human context, certainly, but the subject of the research and the research is to uncover a natural process.

1P3: *But I kind of feel like we can’t, we have to separate ourselves a little bit.*

1P4: Sure you can recognize that it’s in the human context, but-

1P1: Much as a human construction.

1P4: I think that’s important, but I think it’s okay to say that it’s a, narrow down your subject and say, “This is exactly what I’m studying.”

1P1: Alright, what about, we’re studying land use change? Is that a human construction?

1P4: Yeah, sure.

1P1: Okay. So that would be the, okay.

F: So how are your views concerning your reality views on the core question?

1P1: They were high originally, but now I don’t know.

(GROUP LAUGHTER)

Given the exchange leading up to this excerpt, Participant One creates his hypothetical example (“Say I’m the speaker yesterday”) to begin forming an argument about what is and is not a human construction. After making a declarative statement on the subject of his research (“I’m studying the evolution of sex”) he claims, “I feel like all of those ideas are human constructions.” Prefacing such a claim as a feeling, particularly in the wake of the debate leading up to this exchange, is a tactic which engenders complete oral agreement from Participant Two (“I do too”) who only indicated a neutral “3” on her

Toolbox instrument in regard to this prompt, and at first gains agreement with Participant Four (“The human context, certainly”) before Four protests with a contrary conjunction followed by his argument (“but the subject of the research and the research is to uncover a natural process”). At this point, Participant Three, who, like One, indicated strongly agree on her Toolbox instrument regarding the initial prompt, lodges an argument in favor of her score. Like Participant One, she prefaces her claim with an adaptation of “I feel” and, like Participant Four, includes a contrary conjunction to indicate disagreement (“But I kind of feel like we can’t, we have to separate ourselves a little bit”). After her claim, Participant Four once again pairs an expression of agreement with a contrary conjunction (“Sure you can recognize that it’s in the human context, but—”) before he is cut off by Participant One. The two come to an agreement on land use change as a human construction before the facilitator asks whether the group members feel they have similar views regarding the Reality core question, “Do the products of scientific research more closely reflect the nature of the world or the researchers’ perspective?” Participant One compares his impressions before and after the recent exchange (“They were high originally, but now I don’t know”) which initiates a group laughter episode.

In Excerpt 12, Participants One and Three, both of whom strongly agreed with the prompt addressing the human construction of research, employed a tactic whereby they prefaced their arguments with “I feel” statements. Participant Four, who strongly disagreed with the prompt, engages in a countermeasure to the affective verbs by initially agreeing with One and Three, followed by disagreement. This tactic seems to pay homage to the argument and acknowledge the affective phrasing before Four makes his own logic-based argument. This agree-then-disagree tactic keeps the conflict constructive, without alienating or silencing Participants One or Three.

The use of “I feel/felt” statements to preface an argument occurred in turn-by-turn sequences, like the one described above in Excerpt 12, but they also appeared within participants’ longer, monologic speaking turns, as Excerpts 13 and 14 illustrate. In the first, during Session Nine, the group has a lengthy discussion regarding the Confirmation section, specifically the prompt, “There are strict requirements for determining when empirical data confirm a tested hypothesis or conform to theoretical expectations.”

Participant Four, an early-career phase, female economist, has just shared a phenomenon in her department where researchers “don’t report insignificant results, at all. Like, those should not even be in a table.” Participant One, a mid-career phase female who listed anthropology as her single disciplinary identity and has been silent for the previous exchange about the importance of p-values in determining significance, enters the exchange with the following contribution (emphasis added):

(Excerpt 13, Session Nine, Lines 710-728/1338)

9P1: So, *I feel like, um, what's missing from this conversation is the loss of faith, because I feel like ... I mean, the question is why, you know, why would you argue over one paper?* Where is it all going? And I might be influenced because I'm reading, slowly, although it's an easy read, Rob Dunn's book. And then kind of this narrative, this popular narrative of science is like, oh, you know, this really didn't quite sit well with me and I don't know why, you know, even if it reached all the levels. But it's because you know, these people have kind of a bigger question in their mind that they're mulling over. And so all of these little bits and pieces are working on that question. And then also, when they start producing, they do it in bits and pieces, so it isn't like there's this one big piece that shatters everything. It's more like, oh, no, you know, they put out three and four pieces and then four or five later, people are like, oh, you know, that's a body of work there. And that's really saying something. *And so I feel like what's missing here is the larger question that's being asked, um,* and also time, you know, that it takes a little while for things to kind of work their way through, um, both the kind of academic conversation, but even the individual research, I mean, you know, you put stuff out and you're just like, you know, that wasn't really important to me at the time, I don't really care about that.

She uses the phrase “I feel like...” three times in one speaking turn, twice following it with “what’s missing here,” an inherent critique on the conversation at hand. Her vocal intonation and conveyance of her perspective in the audio file is heartfelt. She does not use the cognitive verb “think” once in her entire speaking turn. Thus, this example presents an opportunity to reimagine Participant One’s extended theorizing as one in which she followed her “I feel” statements with emotion, rather than conversational critique, to express herself. Rather than opening with “I feel like what’s missing from this conversation is the loss of faith,” she might have said, “I feel troubled that we’ve

overlooked the bigger picture which extends beyond one paper,” an emotional disclosure which might have changed the course of the conversation in ways demonstrated by Excerpts 8, 9, 10, and 11. As it stands, Participant Fourteen follows One’s extended speaking turn with a story of his own which ties back to an earlier conversation around significance of evidence required to disprove standing theories. The facilitator then reminds the group that there are “four lonely modules” which the group has not yet addressed, and the group moves on without ever addressing Participant One’s monologue.

So far, I have included data excerpts addressing othering and “I feel/felt” statements from every workshop except Session Eight. I ran a matrix query in NVivo, comparing coding frequency of “I feel/felt” statements prefacing arguments against the workshop transcripts and found that Session Eight had the highest frequency of this communicative practice out of all of the IGERT Toolbox workshops, with 15 occurrences. I ran another matrix query, comparing those 15 occurrences against Session Eight participants, and found that of those 15 occurrences, ten came from Participant Three, and I had coded all ten as “I feel/felt” statements prefacing an argument, rather than vocalizing an actual emotion. Many of his statements, such as the one in Excerpt 14, were included in extended speaking terms, as opposed to one-liners like the ones in Excerpt 12. In Excerpt 14, the group transitions into the Values section, specifically the prompt “Allowing values to influence scientific research is advocacy” (emphasis added).

(Excerpt 14, Session Eight, Lines 487-496/789)

8P3: I guess we’re going into values.

(GROUP LAUGHTER)

8P2: I think we’re all trying to skirt around it.

8P3: I think, yeah, to go back to your idea of “Science is perfectly unbiased, white lab coats.” I guess I just disagree with that. I think, again, *I feel like the questions you are asking are influenced by your values*. I think, I think it’s naturally going to happen. I think it’s just whether you acknowledge it or not. I’m trying to think. I remember just that advocacy phrase coming in when a guy—I didn’t hear this presentation—but a guy said, “Dams impede salmon migration, therefore, dams are bad.” Someone else was like, “That was advocacy.” I think of that when I think advocacy. I think, “Well I mean, he’s right.” Obviously, it does impede salmon migration,

and obviously, “bad” is a value laden term. That’s what makes it advocacy. I haven’t worked it out in my mind. I think, I just think it’s natural, it’s just the way you go about it.

Participant Three opens the floor by acknowledging the group’s shift into Values, which draws group laughter and prompts Participant Two to make another obvious statement which reflects on the group’s interactions thus far (“I think we’re all trying to skirt around it”). In response to the prompt about advocacy, Participant Three takes an extended speaking turn and begins by using “I think” twice. However, the second time he uses the verb “think” he pauses afterward, refers to an argument he made earlier in the workshop about scientists’ values influencing whether their research is applied or basic (“again”), and then changes from a cognitive to an affective verb as he makes his central claim (“I feel like the questions you are asking are influenced by your values”). After using the “I feel like...” sentence structure to frame his argument, he reverts back to “I think” statements to continue arguing in its favor, using the phrase “I think” seven times in the same speaking turn, as well as the phrase “I’m trying to think.”

Whereas Excerpt 13 highlighted participants’ use of “I feel like” framing in the context of a value-driven argument which did not include “I think” phrases, Excerpt 14 demonstrates a contrasting approach. Participant Three is reiterating an argument he made earlier in the workshop, and starts out by framing it cognitively through the use of the phrase “I think.” His use of the phrase “I feel” followed by an immediate transition back to “I think,” as well as the frequency with which he uses the phrase “I feel/felt” to preface arguments and claims within the workshop, suggests a deliberate, ulterior motive of persuasion, rather than solely information, in his word choice.

Throughout the IGERT Toolbox workshops, group members prefaced claims and arguments with “I feel/felt,” 77 times, only to immediately transition into cognitive verbs and supporting remarks. The results of a matrix coding query comparing the tactic of framing a claim or argument as a feeling, as indicated by “I feel/felt” statements, revealed that I cross-coded this communicative practice with the Values (18), Confirmation (17), and Motivation (12) sections most frequently, suggesting implications for how IGERT

students negotiate differing perspectives and orientations toward these components of the research process.

Section	“I feel [opinion]”	“I feel [emotion]”
Values	18	0
Confirmation	17	4
Motivation	12	2
Reality	11	0
Methodology	9	1
Reductionism	6	0
<b>Total</b>	<b>77</b>	<b>8</b>

**Table 4.** Frequency of “I feel/felt” communication practices in each of the Toolbox sections.

One possibility for this strategy is the reduction and/or avoidance of potential conflict or counterarguments from other group members. Confirmation is the section with the second highest frequency of this communicative practice, making it the Toolbox section with the highest frequency of othering, both kinds of affective verb statements, and the second highest self-othering frequency. This trend suggests that IGERT students’ communicative negotiation of the research assumptions regarding evidentiary support and the nature of valid findings represents an important context to understand identity and conflict. The Values section of the Toolbox Instrument, which addresses the role of the researcher’s personal perspective in framing research and whether or not allowing values to influence research constitutes advocacy, has the highest instances of affective verbs prefacing argument. It is somewhat fitting that the section of the Toolbox which asks IGERT students to reflect on and share their views on the role of personal perspectives in research is most frequently marked by the students’ expression and framing of arguments as feelings.

However, some degree of conflict around ideas and research perspectives can be healthy, constructive, and enlightening for group members, highlighting areas of difference and similarity between disciplines and approaches to research—no matter which Toolbox section is under consideration. Using affective verbs such as “feel” and “felt” to preface an argument not only softens the claim, it may decrease the possibility of other group members countering with competing ideas and claims of their own because such a claim would be seen as refuting a group member’s feeling, rather than his or her



argument. Such a reduction in the expression of strong, bold beliefs and commitments may decrease participants' likelihood of sharing the full extent of their idea, as well as the quality of the workshop overall.

APPENDIX B  
CODE BOOK EXAMPLE

<b>Code</b>	<b>Definition/Explanation</b>	<b>Example</b>	<b>n</b>
Laughter_Sequence	Group Laughter Sequence: A sequence of speaking turns which begins with, includes, and/or culminates in a group laughter episode	P2: Did you pick 1 for that? P4: I picked 4. P1: I picked 3 because I didn't want to write "I don't know." (GROUP LAUGHTER)	187
Laughter_Group	Group Laughter Episode: Instances of a break in speaking when an episode of group laughter occurred; coded within group laughter sequences	(GROUP LAUGHTER)	263
Othering_Difference	Othering based on difference: Statements where participants distance themselves from an idea, research project, discipline, or community, particularly through the use of second person pronouns such as you, they, their, you guys, and you all	"How do social scientists...do y'all just say, 'Ok, our guy's going into this. I want to promote collaboration between environmental groups and private landowners, and that's my bias,' or what?"	44
Othering_Sameness	Othering based on sameness: Statements where participants align themselves with an idea, research project, discipline, or community, and frame this connection as unique to themselves, particularly through the use of first person and collective pronouns such as I, we, our, and us	"Here I am being kind of the ecologist that I am, thinking, like, there's some value in it just being for the natural aspect of understanding the system."	61
I feel_Emotion	"I feel/felt" verb combinations which preface an emotion	"I feel confident about my answer; I felt strongly about that prompt."	8
I feel_Opinion	"I feel/felt" verb combinations which preface a claim, thought, or opinion	"I feel like the qualitative part of it is really important for developing a question and understanding context that you're asking the question in. But it seems like most scientific papers and economics papers really	77

		emphasize quantitative methods.”	
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