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Collaboration: Who, When, and Why to Work Together

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by

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ABSTRACT

This study looked at how individuals choose whom to work with when a task necessitates collaboration. Prior research done on collaborative environments as well as outcomes of collaboration suggests that who you collaborate with will depend on two primary factors: the individuals from which you have to choose and the circumstances surrounding the task. In the proposed study, these factors will be explored. This thesis identified the lack of literature on informal collaboration, addressing the gap in the literature regarding processes that individuals use when choosing collaborators. This research focused on the influencing factors of similarity and expertise involved in this decision processes. Furthermore, this study aimed to understand how individuals choose collaborators under differing conditions of difficulty, novelty, and interdependence necessitated by the task.

CHAPTER ONE:

INTRODUCTION

The nature of the workplace is changing as increases in technology and globalization influence organizations, and cause the phenomenon of working with others to be progressively more common (Kozlowski & Bell, 2003; Kozlowski & Ilgen, 2006). Collaboration is crucial to completing a number of tasks in the workplace (Campion, Medsker, & Higgs, 1993; Collins & Smith, 2006; Fullagar & Egleston, 2008; Holton, 2001) and as such, organizations are shifting from work organized around individual jobs to work organized around collective work structures (Devine, Clayton, Philips, Dunford, & Melner, 1999; Kozlowski & Bell, 2003; Kozlowski & Ilgen, 2006; Ledford, Lawler, & Mohrman, 1995). This collective work encompasses formal collaboration structures such as teams and multi-team systems as well as informal collaboration, which can take on a number of different forms from advice-seeking to informal leadership.

This study focused on the phenomenon of seeking collaborators, or *collaborator-seeking*, to complete a task, i.e. asking a colleague for help completing a task/project. Unlike formal teams, in which whom to work with is typically assigned by management or leaders, collaborator-seeking returns the agency to the worker with regards to when and with whom to work. When considering asking for help on a given task, individuals can weigh all of the possible options, take into consideration different factors about the task and the people whom they can ask, and then make a choice about whom they want to work with. The choice of whom to collaborate with is likely important because characteristics of team members have been found to

be important predictors of performance (Hackman, 1987; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; McGrath, 1984). There are interpersonal processes inherent to the working relationship, such as information sharing and coordination, that influence how well the overall project is accomplished (Kozlowski & Klein, 2000; Morgeson & Hofmann, 1999). As such, who an individual chooses can impact the quality of their working relationship (Bell, 2007).

Despite the importance of this choice, the wealth of existing literature on formal teams, and many aspects of informal collaboration (e.g., mentoring, informal leadership), no research has been done to study the phenomenon of collaborator-seeking or the antecedents that precede it. Thus, we have little understanding about how people go about making these decisions nor the processes involved. Therefore, workers likely make these decisions with little understanding of how to best weigh different factors and have no roadmap to base these choices on scientific criteria. Understanding the decision process as it currently is will help provide a roadmap for improving this decision process in the future with the ultimate goal of improving workplace functioning.

Though there is a lack of research regarding collaborator-seeking to guide our understanding of the decision-making process inherent to informal collaboration, the variety of literature on formal collaboration provides a foundation regarding the factors that will likely influence the informal collaborative process. Even though the ability to choose collaborators is unique to informal collaboration, outcomes and collaborative processes between formal and informal collaboration are the same. People have preferences for working with others based on experiences gained from both types of collaboration (Abele & Strasser, 2008; Beal, Cohen, Burke, & McLendon; 2003; Campion et al., 1993; Collins & Smith, 2006; Fullagar & Egleston, 2008; Holton, 2001; Mathieu, Kukenberger, Innocenzo, & Reilly, 2015; Mesmer-Magnus &

DeChurch, 2009). Therefore, understanding processes and outcomes in formal collaboration can provide a framework from which we can understand the likely factors influencing collaborator-seeking decisions. Given prior research done on team processes and effectiveness as well as outcomes of formal teams, the decision about whom to collaborate with will likely depend on two primary factors. The first factor is characteristics of the potential collaborators. In particular are the level of expertise of a potential collaborator (Jackson, May, & Whitney, 1995; Ployhart & Moliterno, 2011; Janz & Prasarphanich, 2003; Yuan, Carboni, & Ehrlich, 2009) and the level of overall similarity to a potential collaborator (Gibbons & Olk, 2003; Singh, Hansen, Podolny, 2010; Xu, Kim, & Kankanhalli, 2011; Yu, Hao, Dong, & Khalifa; 2013). The second factor that likely influences this decision process is the characteristics of the task that necessitates collaboration. Of particular importance are the difficulty of the task, the novelty of the task, and the level of autonomy or interdependence the task will require (Campion et al., 1993; Caruso, Epley, & Bazerman, 2006; Gully, Devine, & Whitney, 1995; Janz, Colquitt, & Noe, 1997; Volmer, Spurk, & Niesson, 2012).

The purpose of this study was to evaluate the factors involved in collaborator-seeking by looking at various facets of the task, potential collaborators, and the interactions between them that inform the overall decision process. First, this study reviewed the current literature regarding informal collaboration as it relates to the collaborator-seeking decision process, highlighting the need for research regarding the antecedents of collaboration decisions. Then, I looked at which collaborator factors individuals could be using when deciding whom to collaborate with by looking at the influencing factors of similarity and expertise of potential collaborators. I also looked at which task factors could be influencing this decision, including difficulty and novelty of the task as well as the interdependence inherent to the work being done. In this study, a

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sample of M-Turk workers were presented with multiple task scenarios that varied in task novelty, difficulty, and interdependence to understand how these different task characteristics alter how individuals choose collaborators. In each scenario, individuals had the ability to choose between collaborators with a high level of expertise in the subject of the task or collaborators who had a high degree of similarity with the participant. Throughout the manuscript, special attention is given to the implications of the collaborator-seeking decision process on organizational outcomes.

Informal Collaboration

A common occurrence when working on a project is realizing that a project would be aided by collaborating with others, rather than persisting alone. In some cases, there is a problem with work overload, when one simply has too much work to reasonably complete on their own and needs assistance completing it. In other cases, there is the problem of the work being given to a person who may lack some of the skill set necessary to completing the project in a timely manner. Other possibilities can include an individual believing that a project could benefit from the ideas and input of others. Altogether, there are a multitude of reasons why someone might want or need help from others and when the realization that help is desired occurs, individuals will likely reach out to potential collaborators to aid in accomplishing task goals (Burt, 2000; Granovetter, 1973; Zhou, Siu, &Wang, 2010).

When individuals work together to complete a task, how well they work together will impact task outcomes (Hackman, 1987; Ilgen et al., 2005; Marks, Mathieu, & Zaccaro, 2001; McGrath, 1984). However, informal collaboration poses an issue to workers that is not seen in formal collaboration: namely, workers have to choose their own collaborators. In such situations, individuals tend to rely on their social ties with others to assist them (Agneessens &

Wittek, 2011; Brass, 2011; Lazega, Mounier, Snijders, & Tubaro, 2012). Thus, understanding the process of collaborator-seeking will help us better understand task outcomes as they arise in informal collaboration. Any individual may have numerous options from which to choose when they need help completing a task and they will have to go through a critical decision process to choose between their possible options to find one or more individuals to assist them with their task (Burt, 2000; Granovetter, 1973; Zhou et al., 2010).

Collaborator-seeking arises spontaneously when individuals need to work with others to complete assigned tasks and the outcomes of these tasks impact overall organizational outcomes. Without an understanding of this process, organizations are vulnerable to this process being done improperly, incorrect choices being made, and organizational outcomes being soured. A thorough understanding of the collaborator-seeking decision process can create a foundation from which research can be done in improving this process, and help increase success in for organizations. Thus, this study focused on understanding the process of collaborator-seeking, and hopes to help provide a springboard from which future research can be done regarding best practices.

Factors Influencing Collaborator-Seeking

Currently, most of the research that has been done in collaboration looks at outcomes rather than antecedents and was done outside of the context of informal collaboration, and across various fields (e.g. human capital, economics, and social communication). Thus, while it can inform the current research, it does not encapsulate exactly how the collaborator-seeking decision process is enacted nor does it speak to how different factors will interact with one another to influence the resulting decisions. However, by looking at the extent literature, some

information can be inferred regarding the antecedents of collaborator-seeking and this study aimed to test these ideas.

It is important to understand who chooses to work with whom, because these choices can influence the outcome of the task given, and whether it is successful or even completed. Different individuals have different knowledge, skills, and abilities from one another. Thus, when an individual chooses to work with a collaborator, the choice of who they work with will influence how well they can work together as well as influencing the overall knowledge, skills, and abilities of the pair. While in some cases, the ability to work cohesively with the individual can be most important (Beal et al., 2003; Carron & Brawley, 2000), in other cases, having the most knowledge and ability possible can also be important (Cross & Cummings, 2004; Gray & Meister, 2006), and individuals will have to choose between individuals who vary on these facets. Understanding who chooses to work with whom and under what conditions is crucial to the workplace because these choices often will be the ultimate deciding factor in the success of a task.

Collaborator Characteristics. In formal collaboration, research has shown that increased levels of expertise among individuals leads to better outcomes on task performance (Jackson et al., 1995; Ployhart & Moliterno, 2011; Janz & Prasarphanich, 2003; Yuan et al., 2009). Those who have more task-related knowledge should be more capable of completing those tasks. As such, one criterion that individuals could be using when selecting potential collaborators is the expertise of their possible options. Leveraging the knowledge and abilities of potential collaborators is valuable to ultimately completing tasks because it allows the individual to expand on what they would have been able to do without those collaborators. Collaborators with expertise can contribute meaningfully to projects by lending unique knowledge and

information regarding aspects of the task that can ease the process of completing it. Thus, expertise is an important facet that contributes to whether or not individuals succeed in completing tasks together.

However, sometimes the issue is a matter of how well the individuals can work together. The more individuals have in common with one another, the easier it is to communicate with one another. People prefer, and are more likely to, form relationships with others who are similar to themselves (Lazarsfeld & Merton, 1954). Working with similar others decreases uncertainty (Berger, 1979; Berger & Calabrese, 1975) and increases liking and attraction (Byrne, 1961). As such, another important collaborator characteristic is homophily: how much similar others like and prefer to work with one another. Individuals who are more similar across various facets (i.e. personality, demographics, etc.) are more likely to work well together, communicate more efficiently, and have better outcomes (Gibbons & Olk, 2003; Singh et al., 2010; Xu et al., 2011; Yu et al., 2013).This ease of communication and similarity in background can help facilitate better working relationships and help foster understanding between individuals. Because of this, working with similar individuals leads to better working relationships and often to better outcomes than working with less similar individuals. Therefore, individuals will use homophily as one of the factors upon which they base collaborator-seeking decisions.

Task Characteristics. Across any type of task with any features attributed to it, individuals will likely prefer to collaborate with others who are both similar and have expertise in the subject matter. With both, individuals would probably anticipate good communication, strong cohesiveness, and quality representation of possible knowledge needed to best complete the task. Unfortunately, finding someone who has both is not always possible, and potential collaborators will usually vary from quite heterophilous to extremely homophilous and likewise

will vary in expertise from low to high. Prior research, however, suggests that differences in tasks can influence both cohesion and performance (Arrow & McGrath, 1995; Gully et al., 1995; McGrath, Berdahl, & Arrow, 1995; Webber & Donahue, 2001). The decision of which individual characteristic to put preference on over the other will therefore be dependent on features of the task for which they need to choose the collaborator because tasks can vary widely across a variety of attributes and individuals will likely make decisions differently across these attributes. Thus, the type of task that an individual is working on will likely shift the emphasis regarding what personal characteristics are more salient to the individual making the decision.

Tasks will vary across many attributes. This study focused on three specific task factors that are indicated by the literature as having an influence on group dynamics, cohesion and performance: difficulty (Laughlin & Shippy, 1983; Weingart, 1992), novelty (Ancona & Caldwell, 1992; March, 1991), and interdependence (Saavedra, Early, & Van Dyne, 1993; Steiner, 1972; Van de ven, Delbecq, & Koenig, 1976). This study looked at difficulty as the amount of effort and rigor needed in order to complete the task. Novelty was looked at as the amount of new or unknown information needed to complete the task. Lastly, interdependence was understood in the context of how closely individuals need to work together to complete the task.

Tasks in the workplace vary in level of difficulty, and individuals will have to complete tasks across that spectrum. When tasks are on the more difficult end of the spectrum, an individual may reach out for help to ease their burden. Difficulty is to be conceptualized as level of rigor required by the task, rather than time necessary to complete it. An individual may choose to reach out to a potential collaborator to help make the task easier to complete by reducing the amount of overall effort they need to individually put into the task (Fullagar & Egleston, 2008).

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Likewise, an individual may decide to reach out to a potential collaborator to split the work and make it less rigorous and burdensome (Scribner, Sawyer, Watson, & Myers, 2007). An individual may also choose to involve a collaborator on a difficult task to reduce the amount of time it takes and have it be completed more quickly than they might be able to complete it alone (Oh, Chung, & Labianca, 2004; Oh, Labianca, & Chung, 2006).

Just as with difficulty, tasks in the workplace can vary in level of novelty. Novelty can be conceptualized by an individual's level of familiarity with the nature of the task. When an individual lacks familiarity with the task, then it is novel to them. And when tasks are particularly novel, an individual may try to reach out to someone who is more familiar with the type of task (Borgatti & Cross, 2003; Parmigiana & Rivera-Santos, 2011). An individual may also choose to reach out to a potential collaborator if they have a different skill set which makes the task simpler to complete as they could help explain to the less familiar individual how to complete the task (Borgatti & Cross, 2003).

Lastly, tasks in the workplace will vary on how much interdependence with others they necessitate. Some tasks will require a high degree of interdependence, with individuals working closely together to complete things. Other tasks require very little interdependence, with individuals working autonomously on different aspects of the task to complete it (Saavedra et al., 1993; Thompson, 1967; Van de Ven et al., 1976). Prior research has shown that overall cohesion and performance can be impacted by the degree of interdependence (Ancona & Caldwell, 2001; Kramer & Brewer, 1984; Rico & Cohen, 2005; Tziner & Eden, 1985). This is because when collaborative tasks involve more interdependence, they will necessarily need more overall cohesion to result in high levels of performance, while in tasks that require less interdependence, cohesion becomes a less important factor. Thus, individuals' decision processes regarding

collaborators will likely be impacted by how much interdependence a task will necessitate. When working closely together, cohesion is likely more important. Alternatively, when collaboration is more autonomous then interpersonal closeness is likely less influential in the decision-making process. Therefore, understanding when individuals choose to maximize overall cohesion and performance and when they choose not to is important to understanding the overall decision-making process of collaborator-seeking.

Tasks will often vary in degree of all three of these task factors. Tasks can be difficult, novel, and require high interdependence, or easy, familiar, and require low interdependence, or any combination thereof. Since each of these factors is likely to influence the collaborator-seeking decision process, the interaction of these factors is also likely to influence whether individuals choose to engage in collaborator-seeking and who they will choose when they do.

Making the Collaborator Decision

When individuals need help on a task, they have to weigh different aspects of the task and various potential collaborators. Individuals need to weigh the level information the potential collaborator can provide, their likelihood of being able to help, their likelihood of wanting to help, their expertise in the area, their experience, their ability to share their insights, and their ability to communicate effectively with the individual (Gray & Meister, 2006; Hansen, Mors, Løvås, 2005; Hatala & Lutta, 2009; Monteiro, Arvidsson, & Birkinshaw, 2008). Choosing who to ask for help is a difficult process. While choosing someone similar to the individual will seem easier because of the familiarity associated with similarity, there are times when choosing someone who is an expert could seem more fruitful because they may have more specialized knowledge than the individual does regarding the task. Previous research looking at this choice between similarity and distributed expertise has shown that across different tasks there needs to

be a balance between the two (DeChurch & Mesmer-Magnus, 2010; Katila & Ahuja, 2002; Rosenkopf & Nerkar, 2001).

In many situations, individuals will be more likely to reach out for help to those individuals who are the most similar to them (Gibbons & Olk, 2003). When individuals perceive others who are more similar to themselves, they are more likely to want to interact with those individuals (Hensley & Duval, 1976; Monin, 2003). And this want to interact and communicate with similar individuals can influence who someone is willing to work with in an informal collaborative setting. When informal collaboration occurs, there is good reason to try and work with individuals with whom there is homophily. When similar individuals work together, coordination in a task is generally more successful than when dissimilar individuals work together (Abele & Stasser, 2008; Asendorpf & Wilpers, 1998). Furthermore, similar people interact with one another because it eases communication and helps people better understand one another (Borgatti & Foster; 2003; Brass, Galaskiewicz, Greve & Tsai, 2004).

While choosing someone similar to the individual will seem easier because of the familiarity associated with similarity, oftentimes choosing an expert can be more fruitful because experts may have more specialized knowledge than the individual does regarding the task. Additionally, reaching out to individuals with whom there is less similarity can be incredibly useful because other individuals have information that those who are similar would not have (Berends, Bij, Debackere, & Weggeman, 2006; Borgatti & Halgin, 2011; Cross & Cummings, 2004; Gray & Meister, 2006). Unless the individual is already an expert on the subject matter, working with a collaborator who is an expert can yield unique information that the individual does not themselves possess. And, working with individuals who have unique information regarding various attributes surrounding the task will likely increase overall task performance

(Mesmer-Magnus & DeChurch, 2009). By collaborating with these individuals, new knowledge and opportunities can be created that otherwise would not exist and this can help solve problems novel to the individual that similar others would not have encountered (Cross & Cummings, 2004; Sammarra & Biggiero, 2008).

Because there are compelling reasons why individuals may choose similar or expert individuals, collaborator-seeking decisions are likely to behave differentially across different tasks. While a number of studies have looked at how task design influences collaboration and have shown that individuals value certain characteristics in others differentially dependent on the task (Campion et al., 1993; Caruso et al., 2006; Cottrell, Neuberg, & Li, 2007; Janz et al.,1997; Volmer et al., 2012), we do not yet understand how individuals differentially use task factors to determine their choice for potential collaborators. Understanding these specific task factors as potential motivators for the collaborator-seeking decision process is crucial for identifying the critical characteristics that influence this process.

Individuals feel more comfortable trending toward homophily in the completion of tasks (March, 1991; Rosenkopf & Nerkar, 2001). Thus, when a task is easy, with few problems or issues likely to occur, individuals will trend toward that which they feel most comfortable with: similar individuals. However, individuals are most likely to engage in collaborator-seeking when the need to reduce workload, rigor, and burden (Fullagar & Egleston, 2008, Scribner et al., 2007), i.e. when a task is difficult. In these cases, experts are more able to help reduce problematic task attributes such as workload and rigor. Experts can provide more relevant knowledge, can solve complex issues more quickly, and can find easier ways of solving for more difficult problems. Thus, though an individual may choose based on similarity when the task is

easy, they will choose based on expertise when the task is difficult, such as to reduce workload, rigor, and overall burden to themselves.

> *Hypothesis 1: As the difficulty of the task increases, the likelihood that an individual will collaborate with an expert increases.*

Just as individuals will likely trend toward similarity when a task is easy, they will also be more likely to reach out to similar individuals when a task is familiar to them (Parmigiana & Rivera-Santos, 2011). With familiar tasks, the individual knows what to do and how to do it, and will likely only need a collaborator to make the task move more quickly or to have company while doing it. As such, they would choose an individual with whom they had the most similarity with, and whose company they most preferred. When tasks become less familiar and more novel, individuals will be more inclined to reach out to others who are more familiar with the task or who have a different skill set from the individual choosing (Borgatti & Cross, 2003; Parmigiana & Rivera-Santos, 2011). By reaching out to someone less similar to themselves, they will be more likely to gain better insight into solving a new problem and completing an innovative solution to a previously unknown task. Thus, though an individual may choose based on similarity when the task is familiar, they will choose based on expertise when the task is novel.

> *Hypothesis 2: As the novelty of the task increases, the likelihood that an individual will collaborate with an expert increases.*

Lastly, individuals' choices in the collaborator-seeking process will be dependent on how much interdependence with potential collaborators the tasks necessitate. The more interdependent tasks are, the more interaction there is between the individuals involved. Thus, as tasks become more interdependent, the interactions between collaborators become increasingly more salient to the individuals making the decision. Because of this, individuals should choose

those with whom they have the best team processes, especially coordination and communication. Both of these facets have been shown to be best in homophilous groups (Borgatti & Foster; 2003; Brass et al., 2004; Gully et al., 1995). In more autonomous tasks, though individuals may be working on completing a task with one another, their overall interactions with one another will be minimal comparative to more interdependent tasks. As such, the amount of coordination and communication is far less, making these processes far less important to the overall outcome as well as coordination during the overall task. When tasks allow for more autonomy, individuals will be less reliant on team processes and more reliant on the collaborator's skill-level and ability to complete their portion of the task. In more autonomous tasks, individuals can focus more on maximizing overall skill and ability on the task without having to spend time or effort working to improve cohesion and/or coordination. Thus, though an individual may choose based on similarity when the task is high in interdependence, they will choose based on expertise when the task is high in autonomy.

> *Hypothesis 3: As the interdependence of the task increases, the likelihood that an*
>
> *individual will collaborate with a similar individual increases.*

CHAPTER TWO:

METHOD

Experimental Design

This study aimed to study who individuals choose to collaborate with under various conditions. Previous research suggests that a number of factors will play into these decisions. This study was a two (novelty: high/low) by two (difficulty, high/low) by two (interdependence, high/low) experimental design examining how individuals choose collaborators under different task scenarios. There were a total of eight task scenarios, e.g. High Novelty, High Difficulty, High Interdependence; High Novelty, High Difficulty, Low Interdependence; High Novelty, Low Difficulty, Low Interdependence (see Appendix A for full list of task scenarios). Participants were randomly assigned to one of the eight task scenarios.

Participants

According to Cohen (1992), a medium effect size represents an effect that approximates the average size of observed effects and is likely to be "visible to the naked eye of a careful observer". Given that most effects studied in psychology fit into these qualifications (Cohen, 1992), the same is likely for the observed effects in this study. Furthermore, in the decision-making literature specifically, the majority of effects that are found are also medium in size (Acker, 2008; Aguirre-Rodriguez, Bosnjak & Sirgy 2012; Baltes, Dickson, Sherman, CaBauer, & LaGank, 2001). Therefore, as a decision-making study, the current research should also find medium sized effects. Moreover, though there will be analyses run looking at a possible 3-way

interaction, the clear differences between the various task scenarios should be large enough to elicit an easily noticeable pattern in the data structure. As such, a log-likelihood power analysis looking at the overall 3-way interaction for a medium effect size indicated that each condition needed 112 participants to yield the necessary power for analyses.

MTurk has been shown to exhibit similar levels of validity and quality to other data collection methods (Berinsky, Huber, & Lenz, 2012; Work, 2011) and was therefore used for this study. However, due to the nature of this study being conducted in this format, a high attrition rate was expected. 1267 participants (approximately 150 per condition) were recruited using Mturk to attenuate the risk associated with a high attrition rate. Overall, 321 participants were excluded from analyses for failing to follow instructions and/or failing attention checks. A total of 946 participants (approximately 118 per condition, see Appendix B for full breakdown) were included for analyses (414 male, 528 female, 4 other; 88 Black/African American, 60 Asian, 8 American Indian/Alaska Native, 1 Native Hawaiian/Other Pacific Islander, 40 Hispanic, 703 White, 46 Other). 85 had completed high school, 174 had completed some college, 125 had an Associate degree, 401 had a Bachelor's degree, 131 had a Master's degree, 29 had a Doctoral degree, and 1 participant did not report. Participants all spanned across occupations with 310 in professional/technical occupations, 119 in manager/official/proprietor roles, 129 in clerical roles, 77 in sales occupations, 28 in crafts/trades occupations, 13 in operator roles, 38 in laborer occupations, 71 in service worker roles, 137 in engineering occupations, and 24 in other occupations.

Measures

The full list of scales and items that will be used in this study can be found in Appendix A.

Demographics. Participants were asked to report their age, gender, ethnicity, religious orientation, current degree status, educational status, and employment status. Previous research has shown that demographics are a key indicator of surface-level homophily and heterophily (Harrison, Price, & Bell, 1998), therefore demographics were taken from the focal participant in order to be used for the fidelity of the similarity manipulation in the collaborator-seeking choice.

Personality. Personality was measured using a shortened version of the IPIP (International Personality Item Pool; Donnellan, Oswald, Baird, & Lucas, 2006). Previous research has shown that personality is a key indicator of deep-level homophily and heterophily (Harrison et al., 1998), therefore giving a personality test to the focal participant will also increase the fidelity of the similarity manipulation in the collaborator-seeking choice. Furthermore, the shortened IPIP has been shown to be an effective and valid tool for capturing personality (Cooper, Smillie, & Corr, 2010; Donnellan et al., 2006; Gow, Whiteman, Pattie, & Deary, 2005).

Difficulty. Difficulty was manipulated based on the way in which the task was presented. Specifically, the task was described as simple or complicated as this is the way in which this variable is generally conceptualized (Fullagar & Egleston, 2008; Rosenkopf & Nerkar, 2001; Scribner et al., 2007).

Novelty. Novelty was manipulated by the way in which the task was defined. Specifically, participants were either told directly that they will be completing a pattern task that they are likely to be familiar with, or they will be told that they will be completing a pattern task that they are NOT likely to be familiar with.

Interdependence. Interdependence was manipulated by either telling individuals that they will be working closely together (i.e., intensive interdependence) or dividing the problems

and solving them individually (i.e., pooled interdependence) as this is a definitional usage of interdependence (Saavedra et al.,, 1993; Thompson, 1967; Van de Ven et al., 1976).

Experimental Task

In the experiment, individuals were presented with a scenario where they had to complete 20 pattern task problems with a collaborator. These scenarios differed in level of difficulty, novelty, and interdependence for a total of eight possible scenarios: Low Difficulty, Low Novelty, Low Interdependence; Low Difficulty, Low Novelty, High Interdependence; High Difficulty, Low Novelty, Low Interdependence; High Difficulty, Low Novelty, High Interdependence; Low Difficulty, High Novelty, Low Interdependence; Low Difficulty, High Novelty, High Interdependence; High Difficulty, High Novelty, Low Interdependence; and High Difficulty, High Novelty, High Interdependence. The full list of task manipulations that were used in this study can be found in Appendix B. After being presented with one of these task manipulations, participants will be asked to choose a collaborator: either an individual high in similarity and low in expertise or an individual low in similarity and high in expertise.

Attention Check. Immediately after making their choice, individuals were asked three questions addressing the task manipulation. Specifically, they will be asked one question each regarding the difficulty, novelty, and interdependence: "Did the scenario you were placed in require you to complete math problems or differentiable manifolds?" "Did the scenario you were placed in require you to complete simple or complicated problems?" "Did the scenario you were placed in require you to work together or work individually?". These questions were simple dichotomous questions to make sure they were fully exposed to the manipulation and understood which scenario they were in. Additionally, several attention checks were added in to serve as

attention checks throughout (e.g., "Please select *Strongly Agree*"). If a participant did not pass the attention checks, their data was removed from analysis.

Procedure

The study was designed using Qualtrics and administered through the MTurk system. Participants were compensated $2 for their participation in the study. Individuals first filled out demographic and personality questionnaires to establish a baseline for similarity. After filling out these questionnaires, participants were informed that they needed to perform a task with a collaborator. They were then randomly assigned to one of the eight task scenarios where novelty, difficulty, and interdependence were manipulated (see Appendix B for a complete list of task scenarios). Once presented with their randomly assigned task scenario, participants had to choose an individual to assist them with the task. They were given the choice of two individuals: one high in expertise but low in similarity and one low in expertise but high in similarity. This choice was consistent across all 8 task scenarios:

For the following task, you will need to work with a partner to help you complete 20 problems. You will be working on this task over an online chat.

You will be given two individuals that you can choose between. In addition to the information about the task that you were provided with, they were given an example task and asked to rate their level of experience with similar tasks on a scale that included the following options:
"Somewhat experienced" "Experienced" "Very experienced" "Extremely experienced".

Based on the previous questions you all answered, you will be provided with information regarding how similar the other two individuals are to yourself. You will also be provided with information regarding their amount of experience with similar pattern tasks.

Please select one of the following individuals to work with:

Individual 1:	Individual 2:
Similarity Match: 93%	Similarity Match: 14%
Amount of Experience: Slightly experienced	Amount of Experience: Extremely experienced
○	○

Figure 1: Participant Choice across Scenarios

Participants were then given manipulation checks to ensure that they understood the condition that they were placed in. However, because this study was primarily focus on understanding the choice process, there weren't any tasks for the participants to complete. As such, while participants were told at the beginning of the experiment that the study would take one hour and would require the completion of their given task, the study only took approximately 20 minutes and there were no tasks for the participants beyond choosing who they would work with. Afterward, participants were debriefed and informed that they would not actually have to complete a task and were given more information about the study.

CHAPTER THREE:

RESULTS

In this study, all three independent variables are dichotomous: novelty was manipulated by showing either a high novelty task or a low novelty task, difficulty was manipulated by showing either a high difficulty task or a low difficulty task, and interdependence was manipulated by showing a task that requires either high or low levels of interdependence with the collaborator. The dependent variable is also dichotomous: participants chose between an individual who is high in expertise and low in similarity, or an individual who is low in expertise and high in similarity. As such, all data was categorical.

Across all task scenarios, individuals were slightly more likely to choose experts than similar individuals, with 55.285% (523 out of 946 participants) of all individuals in the studying choosing experts over similar individuals (see Table 2A for more detailed breakdown for frequency of choice). And this preference for experts over similar others extended for all of the individual task conditions. Individuals in low interdependence scenarios selected experts 58.613% (279 out of 476 total participants in low interdependence scenarios) of the time over similar individuals, in high interdependence 51.915% (244 out of 470 total), in low novelty 53.595% (246 out of 459 total), in high novelty 56.879% (277 out of 487 total), in low difficulty 53.448% (248 out of 464 total), and in high difficulty 57.054% (275 out of 482 total). The only scenarios in which expertise was not favored outright by participants was when they were in the combination of interdependence being high and difficulty being low, 50.000% (114 out of 228

total participants favored collaborating with an expert in high interdependence/low difficulty scenarios).

Because all of the manipulations were concurrently presented to participants, I analyzed all of the effects simultaneously in a multinomial logistic regression with categorical variables. I used this analysis to look at the main effects for each independent variable: novelty, difficulty, and interdependence, as well as two- and three-way interactions between them to see how these task factors can potentially influence the decision. First, I dummy coded the variables based on scenario: novelty, difficulty, and interdependence to see how these task factors potentially influence the decision. This was done by coding based on scenario in order to analyze across the independent variables that are not in use. When looking at novelty, scenarios with low novelty were dummy coded to 0 and scenarios with high novelty were coded as 1. Thus, I was able to test if the high novelty group chose differently from the low novelty group by creating a new variable where individuals were categorized as either being in a low novelty scenario or being in a high novelty scenario. This same process was conducted separately for difficulty (scenarios with low difficulty were dummy coded to 0 and scenarios with high difficulty were coded as 1) and interdependence (scenarios with low difficulty interdependence were dummy coded to 0 and scenarios with high interdependence were coded as 1) creating their own new respective variables. Similarly, the overall choice was also coded so that the choice of similar individual was coded as 0 and the choice of an expert was coded as 1. For the two-way interactions, I combined across the dummy coded variables for each of the task scenarios (difficulty*novelty, difficulty*interdependence, novelty*interdependence) so that the overall model could look at each of these effects across all levels of the variable not in use. For example, by combining difficulty and novelty, (difficulty*novelty), I could look at this effect across all levels of

interdependence. For the three-way interaction, I combined across all of the dummy coded variables (difficulty*novelty*interdependence).

Multinomial logistic regression was performed to determine whether there is a significant difference in choice of collaborator dependent on the difficulty, novelty, or level of interdependence in the task. The results showed that none of the independent variables were significantly associated with choice (difficulty, OR = 0.813, p = .436; novelty, OR = 0.751, p = .277; interdependence, OR = 1.164, p = .566, see Table 3A). Therefore, none of the hypotheses were supported. The results of the regression also showed that the two-way interaction between difficulty and novelty was not significantly associated with choice (OR = 1.137, p = .733). Similarly, the interactions between difficulty and interdependence (OR = 1.070, p = .857) and between novelty and interdependence (OR = 1.285, p = .502) were not significantly associated with choice. Lastly, the three-way interaction with all of the variables was not significant (OR = 0.861, p = .777, see Table 3A). Additionally, the omnibus test was not significant X^2 (15, N = 946) = 7.204, p = 0.408 and had a very low R^2 (0.008).

Subsequently, chi-squared tests were performed to look at overall main effects of condition and found that there was a significant relationship between level of interdependence and choice, X^2 (1, N = 946) = 4.293, p = 0.038, but no significant relationship between novelty and choice, X^2 (1, N = 946) = 1.031, p = 0.310, nor between difficulty and choice, X^2 (1, N = 946) =1.243, p = 0.265). This shows that in the observed pattern of responses from participants, interdependence had a significant association with choice independent from the other task variables (expertise was significantly favored when interdependence of task condition was low). However, in the study, interdependence was not studied independently. All three of the independent variables (difficulty, novelty, and interdependence) were given to participants

concurrently. Therefore, while interdependence may show a significant effect independent from difficulty and novelty, this effect does not hold in the presence of the other two task variables as evidenced by the lack of significant findings in the overall multinomial regression model.

CHAPTER FOUR:

DISCUSSION

In the workplace, individuals are commonly confronted with the need to choose between their social ties to find collaborators to work with on tasks (Agneessens & Wittek, 2011; Brass, 2011; Lazega et al., 2012). Previous literature has shown that how well individuals work together can heavily influence task outcomes (Hackman, 1987; Ilgen et al., 2005; Marks et al., 2001; McGrath, 1984). Without a clear understanding of the initial decision-making process, individuals and organizations will continue to be vulnerable to the possibility of it not being done properly. By clearly understanding this phenomenon, we can create a foundation from which research can be done to improve the overall process of collaborator-seeking, collaboration brought forth by it, and the organizational outcomes that result from it.

In this study, there was a focus on understanding which factors pertaining to the task might influence collaborator choice. The task factors in this study included difficulty, novelty, and interdependence. The literature indicated that these three facets of task type were the most salient and likely to influence the choice (Borgatti & Cross, 2003; Borgatti & Foster; 2003; Brass et al., 2004; Gully et al., 1995; Fullagar & Egleston, 2008, Parmigiana & Rivera-Santos, 2011; Scribner et al., 2007). However, the results of the study indicated that in the experimental setting, none of these factors, nor the interactions between them, influenced collaborator choice.

In this study, the focus was on increasing the internal validity of the manipulation to have all three task-related factors manipulated as clearly as possible. In true workplace scenarios, task factors are far less clearly defined compared to what was done in this study. However, results in

the field usually show smaller effect sizes. Because this study wanted to capitalize on its ability to find effects and most clearly manipulate all three task-related factors, some of the realism of true workplace tasks was sacrificed. In the workplace, tasks would not be constrained to high/low difficulty, novelty, and interdependence. They would vary across all three of those factors as well as across a number of other potential factors. Moreover, tasks in the workplace do not occur in isolation, they occur in tandem with other tasks and overarching job needs, and individuals are likely to make decisions differently based on external factors as well. Similarly, in the workplace, others are not always readily available to assist (Borgatti & Foster, 2003; Faniel & Majchrzak, 2007; Gray & Meister, 2006) putting constraints on individuals in terms of who they can choose to work with and whether or not those others will be willing to work with them if asked (Xu et al., 2010; Yuan et al., 2010). Due to the overarching complexity of understanding a single choice within a single task amidst the vast array of choices, tasks, and individuals that exist within organizations, this study sacrificed some of the realism of the workplace to better focus on the particular intricacies of the collaborator-seeking process. However, this sacrifice likely led to the task factors not being as psychologically realistic to the participants as they were meant to be. As a result of this lack of realism, participants were less likely to take the task seriously, increasing the amount of error to be much greater than what would be found in real workplace environments. Thus, the ability to see the expected relationships between task factors and choice was hindered. So while prior literature would indicate that the task is going to influence who gets chosen (Borgatti & Cross, 2003; Borgatti & Foster; 2003; Brass et al., 2004; Fullagar & Egleston, 2008; Gully et al., 1995; Parmigiana & Rivera-Santos, 2011; Scribner et al., 2007), it is likely that this is something that cannot quite be replicated in a laboratory environment.

This study was conducted in the experimental online setting as a means of increasing overall control. The primary goal in doing an experiment, rather than a field study, was to increase the overall internal validity, eliminate possible confounds, and to control for many of the difficulties that would have been incurred from studying collaborator-seeking in the workplace. While it would be possible to study this phenomenon in the field, it would not be possible to have the level of control over all variables studied and internal validity would have to be sacrificed. In the workplace, the impromptu nature of collaborator-seeking makes tracking the overall process a difficult task in and of itself. And while there are some organizational instances in which it can be anticipated (e.g. projects in which individuals are told to form their own teams), these instances are rare. Furthermore, it would be difficult for researchers to track each element of the process that individuals go through when they make the decision, due to the amount of information that goes into the decision process (Glöckner & Betsch, 2008; Tor & Bazerman, 2003) as well as individuals' difficulty to articulate why they made the choices they made (Arbel, 1989; Kahneman, 2011; Wilson, Dunn, Kraft, & Lisle, 1989). By conducting the study in an experiment, I was able to clearly manipulate different aspects of the task to see if and how each individual task element influenced the choice. Similarly, I was able to constrain choice to only two options and isolate the broad areas of similarity and expertise. While in real workplace scenarios, individuals will choose collaborators based on specific areas of both and will likely have far more than two options, this constraint allowed me to look at the two general areas that were indicated by the literature to be the most likely collaborator-related factors that individuals choose between. In the workplace, individuals could have potentially dozens if not hundreds of people to choose from that each differ in some small way from one another. In the study, by only having two individuals to choose from and clearly manipulating elements of each,

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I was able to look at what broad facet of potential individuals could make the participants more likely to choose one over the other.

Limitations and Future Directions

There are, additionally, a number of limitations that could have affected the results (or lack thereof). One major limitation was the manner in which the levels of the dependent variable were manipulated. Both similarity and expertise were somewhat weak, with similarity being manipulated solely through a percentage score of similarity and expertise being manipulated with a single two-word descriptor. For similarity, in the workplace, individuals generally have a much better image of how similar others are based on time spent working together in the past and information known (Abele & Stasser, 2008; Asendorpf & Wilpers, 1998; Gibbons & Olk, 2003; Hensley & Duval, 1976; Monin, 2003). When individuals get to know others better, they perceive similarity differently and base their judgments off of different facets of the person. Prior research on collaboration has indicated that constructs such as individuals' personality facets can affect collaborative efforts (Asendorpf & Wilpers, 1998; Barry & Stewart, 1997; Humphrey, Hollenbeck, Meyer, & Ilgen, 2007; Walle & Hannay, 2009). For example, Walle & Hannay (2009) found that individuals who had similar levels of agreeableness had poorer communication and collaboration while individuals with similar levels of extraversion had better communication and collaboration. Similarly, Humphrey and colleagues (2007) found that individuals worked better together when they had similar levels of extraversion. They further found that individuals work better together when conscientiousness and openness to experience are similar between individuals. Since individuals are more likely to choose individuals who they work well with, they should be more likely to choose individuals who are similar to them on these personality facets, whereas they will be more likely to choose experts over individuals who share similarities

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with them on other personality facets such as neuroticism and agreeableness. This indicates that homophily would be predictive of choice dependent upon what specific areas individuals are similar.

Because this experiment aimed to construe similarity in a simple way that was easy for participants to understand and interpret in the online format, individuals were not able to see what specific areas they were or were not similar to the others that they were choosing between, only a percentage of overall similarity. Rather than give participants information regarding which similarities individuals shared (demographics, personality facets, etc), I gave them one single overall value for total similarity. By not being able to know how they were similar to their choices, participants could not make decisions based on the more nuanced aspects of the individuals they were choosing between. Harrison and colleagues (1998) showed that individuals see similarity differently between those they know well, and those they do not know as well. Specifically, individuals will focus on surface-level attributes with those they do not know, while they instead will focus on deeper-level factors with those they do know (Harrison et al., 1998). With those they don't know well, individuals will focus on factors like gender, race, and other demographic facets to determine similarity. With those they do know well, individuals will focus on factors concerning individual differences like personality constructs and similar interests. This makes similarity a construct that is perceived differentially depending on level of familiarity and various differing aspects pertaining to the individual. Having both knowledge and shared experience with other individuals, and knowing which idiosyncrasies pertaining to those others make them similar or different, is fundamentally different from a single algorithmic number informing the person of overarching "similarity". As such, being given this percentage score simply is not as potent an indicator of similarity as actually knowing others.

Additionally, telling participants an overall percentage score of how similar they are to others is not as potent an indicator of similarity because there is a fundamental difference in perception between feeling similarity to another individual and simply being told that this similarity exists. In this study, participants had to choose between two strangers due to the nature of how the information was presented to them. Because different facets of individuals can be weighed differently (Asendorpf & Wilfers, 1998; Harrison et al., 1998; Walle & Hannay, 2009), participants simply would not have been able to weigh the various and nuanced factors of similarity in the same way that they would with familiar others for whom they were able to take those factors into account. In the workplace, individuals have knowledge of their colleagues to varying degrees (Gibbons & Olk, 2003; Kleinbaum, Stuart, & Tushman, 2013), and establish feelings of similarity based on this knowledge and their shared experiences. Without the ability to establish their own baseline of similarity with potential collaborators based on these more nuanced factors, participants were less likely to fully believe in the similarity of these potential collaborators despite being told that they were similar or not.

For expertise, in the workplace, generally there is some understanding of which individuals are likely to know which specialized areas of information (Gray & Meister, 2006). Because individuals know more specifics about who has what type of expertise, they can better know how to and who to reach out to. This is done through individuals having knowledge of their network of contacts within an organization and what specialized areas others work within (Cross & Cummings, 2004; Faniel & Majchrzak, 2007). In this experiment, for expertise, participants were only told the degree to which prospective individuals had self-reported expertise in the task, with no objective information for participants to rely upon. As such, they could not make their own judgments about whether or not the potential collaborators had

expertise that they would have felt would be useful for the given task, nor were they able to make distinctions between levels of expertise or any other nuances that would normally arise in the workplace. Having this more nuanced knowledge about exactly what areas and to what extent individuals have expertise changes who individuals may choose to work with. Those choosing between potential collaborators likely need to know what type of expertise individuals have, how much expertise do individuals have in that area, and how relevant all of their collective expertise is to the specific task. Thus, having this type of more detailed knowledge about others' capabilities can change how the collaborator-seeking decision is made.

Additionally, this study didn't allow the participants to fully understand the nuances of the task itself, making it difficult to ascertain what expertise in the task would resemble or mean. In the workplace, individuals likely have a much better sense of what needs to be done and what they need/want when going to look for someone to collaborate with. However, in this study, individuals were simply told that they needed to collaborate with another individual and were not told any details pertaining to why this collaboration was necessary or how it could be beneficial to the completion of the task or to the individual choosing the collaborator. This would have led to participants not fully being able to understand or appreciate the help that working with an expert would have on completing the task thus making participants de-emphasize the importance of the information that an individual was or was not an expert.

Further, one major factor that this study was unable to account for was the expertise of the participant. Because no real task was being performed, it would be difficult to isolate who would or would not be considered an expert in the task area. When individuals need help on a task in the workplace, they have to weigh different aspects of the task and various potential collaborators based on their own experiences, abilities, and expertise in the subject matter.

Individuals need to weigh the level information the potential collaborator can provide to them, their expertise and experience in the area, and how it can complement their own (Gray & Meister, 2006; Hansen et al., 2005; Hatala & Lutta, 2009; Monteiro et al., 2008). If an individual is already an expert in the task area, then they are less likely to need further expertise on the topic and can allow themselves to work with a more similar other, regardless of their expertise. If an individual is a novice, or otherwise has little expertise in the task area, then they will need to prioritize working with an expert above other factors. Thus, individuals who have more expertise are more likely to choose similar individuals to work with while individuals who have less expertise are more likely to choose to work with experts. Because of the hypothetical nature of the task in this study, whereby no task was actually performed, it would not be possible to objectively see and understand the degree to which participants in this study could be considered experts in the task area. This would lead to participants subjectively making their own assumptions about both the task and their degree of expertise in it. This would then transform the decision-making process for each individual, differentially changing it as a function of the individual and their assumptions. Thus, by not being able to account for participant expertise in this experiment, these assumptions made by each individual participant would have led to an inflation of error in the decision-making process.

Subsequent research is needed to understand the process of collaborator-seeking and discover which factors contribute to individuals' choice of collaborator. Though the manipulations tested in this study did not yield results regarding contributing factors to this phenomenon, it is important to continue to attempt to find a way of doing so. One way of doing this could be to look again at this phenomenon in an organizational context with real tasks that individuals perform on a day-to-day basis to enhance the external validity of the study and better

understand task and individual factors as they operate in real situations that employees find themselves in. This could be done through a combination of experience sampling to quantify if and when individuals are making these decisions as well as qualitative diary entries to explain why they chose the collaborator(s) that they did. One possible direction to start conducting workplace research could be in the area of academic research, due to the prolific amount of impromptu collaboration that occurs as individuals come to work together on a variety of different research and community projects. By looking at it in the organizational context, future research could capture the various differences between potential collaborators beyond the two overriding factors used in this study. In the workplace, researchers could see all of the small differences in both similarity and expertise across all of the different possible options. And, this would allow researchers to look at other possible collaborator factors that could be influencing choice.

Furthermore, individuals may choose collaborators differently in realistic job scenarios, in which they need to do the task to perform their job effectively. When the collaborator-seeking decision influences their job, the stakes are much higher than they otherwise would be in an experiment and prior research has shown that individuals make decisions differently when the stakes involved are different (Andersen, Ertaç, Gneezy, Hoffman, & List, 2011; Carpenter, Verhoogen, & Burks, 2005). When the stakes involved are low, little weight is being placed on making the correct decision while in high stakes environments, individuals will be more likely to carefully deliberate to make the best possible decision. When an individuals' job is dependent on their ability to effectively perform their job tasks, the stakes involved are much higher than when they are completing a short survey for a research study. In the less realistic online setting, individuals would be less likely to carefully consider and weigh all possible factors associated

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with a given collaborator, leading to more arbitrary decision-making. In the organizational setting, individuals have to be more careful in how they consider and weigh factors to ultimately make the best decisions for their careers. Thus, it is likely that conducting this study in the organizational setting where stakes are much higher for the individuals involved would yield different results than were found in the experimental setting.

Another possible limitation of this study was that individual differences in those making the decision were largely unaccounted for. Prior research in decision-making has given an indication that personality facets can affect how individuals make choices (Hilbig, 2008; Lauriola & Levin, 2001). For example, individuals who are higher in openness to experience are more likely to make risky decisions while individuals who are higher in neuroticism are less likely to make risky decisions (Lauriola & Levin, 2001). And when choosing between an individual who is similar and one who is an unknown but an expert, there is a difference in risk with each possible choice and in each possible task: working with an expert in a novel situation is less risky, while working with a novice in a novel situation is more risky. These individual differences could be important moderators within the choice process, influencing how different types of individuals perceive task-oriented and collaborator-oriented factors and thus how they end up making their decisions. By not accounting for these potential moderators, the ability to detect expected relationships would be hindered by error added into the results. Future research should look at the various facets of the personalities of those making the choice as well as other untested, potential individual differences that could be contributing to collaborator-seeking. Specifically, it is likely that collaborator decisions will have some basis in the personalities of those selecting others to work with.

Conclusion

   While the present study was unable to detect which factors contributed to individual decision-making in collaborator-seeking, the understanding of this phenomenon is still crucial to improving task outcomes in informal collaborative environments in the workplace. Overall, it is important to understand the collaborator-seeking decision process and which factors guide it. Currently, these decisions are being made without any understanding of the process and without any guiding information to assist in the selection of collaborators. Without any form of decision aid to help individuals, both employees and organizations are vulnerable to these decisions being made improperly and incorrectly, leading to potentially disastrous outcomes. If we can understand which factors drive this process, then we can create a foundation from which it can be studied more thoroughly and improved upon, helping both individuals and organizations.

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APPENDIX A:

TABLES

Table 1A. Study Hypotheses

Hypothesis 1	As the difficulty of the task increases, the likelihood that an individual will collaborate with an expert increases.
Hypothesis 2	As the novelty of the task increases, the likelihood that an individual will collaborate with an expert increases.
Hypothesis 3	As the interdependence of the task increases, the likelihood that an individual will collaborate with a similar individual increases.

Table 2A. Frequency of Choice Selection by Condition

Interdependence	Novelty	Difficulty	Choice	Frequency	Percentage
Low	Low	Low	Similarity	56	46.70%
			Expert	64	53.30%
		High	Similarity	47	41.60%
			Expert	66	58.40%
	High	Low	Similarity	46	39.70%
			Expert	70	60.30%
		High	Similarity	48	37.80%
			Expert	79	62.20%
High	Low	Low	Similarity	55	50.50%
			Expert	54	49.50%
		High	Similarity	55	47.00%
			Expert	62	53.00%
	High	Low	Similarity	59	49.60%
			Expert	60	50.40%
		High	Similarity	57	45.60%
			Expert	68	54.40%

Table 3A: Summary of Multiple Logistic Regression Analysis for 3-way interaction of Difficulty, Novelty, and Interdependence predicting Choice

	B	S.E.	p value	OR
Intercept	-.134	.183	.466	
Difficulty	-.206	.264	.436	0.813[1]
Novelty	-.286	.264	.277	0.751
Interdependence	.152	.265	.566	1.164
Difficulty * Novelty	.128	.373	.733	1.137
Difficulty * Interdependence	.068	.375	.857	1.070
Novelty * Interdependence	.251	.374	.502	1.285
Difficulty* Novelty * Interdependence	-.149	.526	.777	0.861

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[1] In this case, Odds Ratios were looking for 1 (not 0) to determine significance (i.e. the parameter is significant when the Confidence Interval does not include 1).

Demographics

1. What is your Gender? Female, Male, or Other _____
2. What is your race/ethnicity (Choose as many as apply): Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Hispanic, White (non-Hispanic), Other _____
3. What is your marital status? Single (never married), Married, Domestic Partnership, Widowed, Divorced, Separated
4. Please answer to the best of your ability:
    a. Do you consider yourself religious?
    b. How important is religion in your life?
            Not at all   Slightly   Moderately   Very   Extremely
5. What is your political orientation?
    Extremely Liberal   Slightly   Moderate   Slightly   Conservative Extremely
    Liberal   Liberal   Conservative   Conservative
6. What is your level of education? High School Diploma or Equivalent, Some College, Associate Degree, Bachelor's Degree, Master's Degree, Doctoral Degree
7. What is your occupational industry? Professional/technical, manager/official/proprietor, clerical, sales, crafts/trades, operator, laborer, service worker, engineer, other_____

IPIP

Instructions: This section contains 50 statements describing people's behaviors. **Please use the rating scale below to describe how accurately each statement describes you**. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

Very inaccurate	Moderately inaccurate	Neither Inaccurate nor accurate	Moderately accurate	Very accurate
1	2	3	4	5

1. Am the life of the party.
2. Feel little concern for others.
3. Am always prepared.
4. Get stressed out easily.
5. Have a rich vocabulary.
6. Don't talk a lot.
7. Am interested in people.
8. Leave my belongings around.
9. Am relaxed most of the time.
10. Have difficulty understanding abstract ideas.
11. Feel comfortable around people.
12. Insult people.
13. Pay attention to details.
14. Worry about things.
15. Have a vivid imagination.
16. Keep in the background.
17. Sympathize with others' feelings.
18. Make a mess of things.
19. Seldom feel blue.
20. Am not interested in abstract ideas.
21. Start conversations.
22. Am not interested in other people's problems.
23. Get chores done right away.
24. Am easily disturbed.
25. Have excellent ideas.
26. Have little to say.
27. Have a soft heart.
28. Often forget to put things back in their proper place.
29. Get upset easily.
30. Do not have a good imagination.
31. Talk to a lot of different people at parties.
32. Am not really interested in others.
33. Like order.
34. Change my mood a lot.
35. Am quick to understand things.
36. Don't like to draw attention to myself.
37. Take time out for others.
38. Shirk my duties.
39. Have frequent mood swings.
40. Use difficult words.
41. Don't mind being the center of attention.
42. Feel others' emotions.
43. Follow a schedule.
44. Get irritated easily.
45. Spend time reflecting on things.
46. Am quiet around strangers.

47. Make people feel at ease.
48. Am exacting in my work.
49. Often feel blue.
50. Am full of ideas.

APPENDIX C:

STUDY TASK SCENARIOS

Difficulty = Easy vs. Difficult
Novelty = pattern task problems that you are likely to be familiar with vs. pattern task problems that you are likely to NOT be familiar with
Interdependence = divide and conquer vs. work together

Low Difficulty, Low Novelty, Low Interdependence (120 participants)
In the following task, you and your partner will have to solve 20 simple pattern task problems that you are likely to be familiar with. You will work with your partner to solve all 20 problems. Though you are working as a team, you should divide the problems and individually solve each one until all 20 are solved.

Low Difficulty, Low Novelty, High Interdependence (109 participants)
In the following task, you and your partner will have to solve 20 simple 2-person pattern task problems that you are likely to be familiar with. You will work with your partner to solve all 20 problems. The two of you will work together on each problem until all 20 are solved.

High Difficulty, Low Novelty, Low Interdependence (113 participants)
In the following task, you and your partner will have to solve 20 complicated pattern task problems that you are likely to be familiar with. You will work with your partner to solve all 20 problems. Though you are working as a team, you should divide the problems and individually solve each one until all 20 are solved.

High Difficulty, Low Novelty, High Interdependence (117 participants)
In the following task, you and your partner will have to solve 20 complicated 2-person pattern task problems that you are likely to be familiar with. You will work with your partner to solve all 20 problems. The two of you will work together on each problem until all 20 are solved.

Low Difficulty, High Novelty, Low Interdependence (116 participants)
In the following task, you and your partner will have to solve 20 simple pattern task problems that you are likely to NOT be familiar with. You will work with your partner to solve all 20 problems. Though you are working as a team, you should divide the problems and individually solve each one until all 20 are solved.

Low Difficulty, High Novelty, High Interdependence (119 participants)

In the following task, you and your partner will have to solve 20 simple 2-person pattern task problems that you are likely to NOT be familiar with. You will work with your partner to solve all 20 problems. The two of you will work together on each problem until all 20 are solved.

High Difficulty, High Novelty, Low Interdependence (127 participants)
In the following task, you and your partner will have to solve 20 complicated pattern task problems that you are likely to NOT be familiar with. You will work with your partner to solve all 20 problems. Though you are working as a team, you should divide the problems and individually solve each one until all 20 are solved.

High Difficulty, High Novelty, High Interdependence (125 participants)
In the following task, you and your partner will have to solve 20 complicated 2-person pattern task problems that you are likely to NOT be familiar with. You will work with your partner to solve all 20 problems. The two of you will work together on each problem until all 20 are solved.

APPENDIX D:

IRB APPROVAL

USF
UNIVERSITY OF
SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 ● Tampa, FL 33612-4799
(813) 974-5638 ● FAX (813) 974-7091

2/6/2019

Michelle Kaplan
Psychology
Psychology/Communication Sciences and Disorders
4202 E Fowler Avenue, PCD4118
Tampa, FL 33620

RE: **Expedited Approval for Initial Review**
IRB#: Pro00039017
Title: Collaboration and Problem Solving

Study Approval Period: 2/3/2019

Dear M. Kaplan:

On 2/3/2019, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below. **Please note this study is approved under the 2018 version of 45 CFR 46 and you will be asked to confirm ongoing research annually in place of a full Continuing Review. Amendments and Reportable Events must still be submitted per USF HRPP policy.**

Approved Item(s):
Protocol
Document(s):
Collaboration and Problem Solving Protocol January 15, 2019 V1

Consent/Assent Document(s)*:

[Collaboration and Problem Solving Informed Consent Form v1](#)**

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved. ****Online survey coversheets are not stamped.**

It was the determination of the IRB that your study qualified for expedited review which includes activities that: (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45 CFR 46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your study qualifies for a waiver of the requirements for the documentation of informed consent for this online survey as outlined in the federal regulations at 45 CFR46.117(c), which states that an IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds any of the following: (1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject (or legally authorized representative) will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; (2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the
research context; or (3) if the subjects or legally authorized representative are members of a distinct cultural group or community in which signing forms is not the norm provided that the research presents no more than minimal risk of harm to subjects and provided there is an appropriate alternative mechanism for documenting that informed consent was obtained.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB via an Amendment for review and approval. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) business days.

We appreciate your dedication to the ethical conduct of human subjects research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Melissa Sloan, PhD, Vice Chairperson
USF Institutional Review Board