



UNIVERSITY OF GOTHENBURG

# **Online Community Membership and Social Impact Theory: How Does Distance Influence Persuasion, Cooperation, and Perception?**

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It is important to me to focus my research on marginalized groups, which led me to the idea of looking at online communities. Online communities do not necessarily have much to do with marginalization, but they have proven instrumental in providing support for people who are unable to find that support offline. These virtual spaces hold a metaphorical spot in my heart, so I feel the need to, however silly it is, thank the developers, engineers, computer scientists, etc. that made connection over distance possible. Furthermore, I would like to thank all of the online communities of which I have been a part, even quietly, for existing and for making your spaces supportive and welcoming. Lastly, I would like to thank the members of a certain blog for being unbelievably kind, curious, and generous with their time.

## Abstract

Social Impact Theory, developed in the 1980s by Bibb Latané, proposes, among other things, that the quality of relationships generally decreases over distance. Much past research regarding SIT has specifically tested behaviors and perceptions related to persuasion and cooperation. This research builds off of past research to test these behaviors and perceptions over two different distance conditions: a task partner located 50 miles away from a participant and a task partner located 5000 miles away from a participant. This research adds an additional condition: self-identification as a member of an online community. Participants originally responded to a survey asking about online community membership, and then went on to complete a series of online tasks with a task partner at one of the two distances. Half of the task participants ( $n = 32$ ) were members of online communities, and most of the survey responders involved in online communities used Facebook as their primary platform for interactions. The other half ( $n = 32$ ) of task participants were not members of online communities.

It was hypothesized, based on the carryover effect, that online community members would be less likely to be affected by distance than participants who were not members of online communities. Most of the results were inconclusive, though trends indicate that distance did not seem to have played a very strong role. However, there were some conclusive results regarding the self-identification condition: online community members were likelier than non-online community members to be cooperative and to perceive their task partner as cooperative, regardless of distance. This may be explained in part by the carryover effect or perhaps Social Identity Theory processes. Recommendations are based on the trends visible in the results and the conclusive results: remote work-based employers ought to consider whether they facilitate development of an online community among their employees and whether their choice of platform is beneficial. Future research should continue along this vein, but with larger sample sizes.

**keywords:** Social Impact Theory (SIT), online communities, cooperation, persuasion, perception, Actor-Network-Theory (ANT), carryover effect

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## 1 Introduction

When we think of community, what do we think of? Do we imagine gathering in the same space on a regular basis? Do we imagine visiting each other in times of need and talking to each other about our problems? Do we imagine doing favors for each other -- lending money, cooking meals, babysitting kids -- simply because we care? Do we imagine spending time with each other for fun? Many of us might imagine these things, but with the increase in availability and accessibility of a multitude of communication technologies, many of us may imagine similar actions in a virtual space.

Through communication technologies, we may imagine regularly reading each other's daily thoughts and sharing our messages of support on Facebook. We may think of the times we donated to each other through PayPal when money was tight and rent was due. Although we cannot necessarily drive over to a community member's house with a lasagna, we may imagine our willingness to offer up our couch should the occasion arise that someone in our community visits our area and needs a place to stay. We virtually play games together, laugh together, and make connections that feel no different (and sometimes feel stronger) than those we make offline. For some of us, communication technologies have enriched our social worlds and provided us with support networks that are only possible because the restraints of the offline world, like distance, do not matter.

But what if distance does matter? What if all of these virtual interactions, as real and valuable as we may feel they are, do not have the impact that we believe they have? Of course, there are certain acts that have the same tangible effect no matter where we may be located in relation to our community. For instance, if you donate \$20 to your friend, that friend has the same amount of money whether you live 50 or 5000 miles from each other. But what about the less tangible interactions we have with each other online? Of course, we do have strong connections with people who are located far away from us that build in subtle ways, but Social Impact Theory (Latané, 1981) suggests that these are exceptions to general principles of community formation.

Social Impact Theory suggests that distance, as well as group size and strength, plays an important role in how we communicate with each other. Taken on an individual level, there will certainly be variances that will not always align with Social Impact Theory's predictions, but on the whole, there is evidence that the theory applies across cultures and subcultures. It may seem obvious that we might feel that we have less in common with people who are located far away from us. After all, we may have fewer points of cultural references over which to reminisce. We are also less likely to be affected by historical events in relatable ways. Social Impact Theory, however, takes the position that cultures and communities have clustered and stabilized *because of* this distance (Latané, 1996). It suggests that distance is so consistent of an obstacle for relationships that its impact can be represented mathematically. Furthermore, it implies that even when we can expect to share cultural meaning with another individual, we are still less likely to relate to them the farther away they are from us.

If Social Impact Theory is accurate, it may have profound implications for how we organize our lives. Those of us who work from home with virtual teams may wonder what sort of affects our working arrangement has on team unity. What about the lone consultant who uses Skype to interact with a new work group from across a country? Will that person truly be able to connect in important ways with their new

colleagues? What does Social Impact Theory imply for online communities? Does this relegate them to second-class community-ship? Can they possibly act in place of offline communities, or are they simply poor stand-ins? Alternatively, if so many of us feel that online communities provide the connections we are looking for, could that instead have implications for Social Impact Theory? Does it still make sense to believe that distance matters so much when communication technologies seem able to nearly eliminate the space between us?

This research intends to investigate whether Social Impact Theory still applies for those who are involved in online communities. Does distance truly matter? This research compares people who are involved in online communities and people who are not by separating each group into two further groups. This research intends to test participants as they complete tasks that require persuasion and cooperation. Will those located at a further perceived distance from their task partner be less persuaded or less cooperated? Will participants even perceive distance differently based solely on textual information about where their task partner is located in relation to them? Will distance noticeably affect interactions depending on online community membership? Will distance matter at all? These are the questions that will be addressed by this research.

## **2 Definition of Terms**

### **2.1 Online Communities**

For the purposes of this research, it is important to have a clear understanding of what online communities are. According to McArthur and Bruza (2001), there are three types of research that have attempted to define online communities, those being the sociological, the experiential, and research related to information technology (IT). Each domain has offered a unique perspective to the concept, but IT research seems to have made the most progress in locating key aspects of online community. McArthur and Bruza distill these aspects into four components: purpose, commitment (which is defined as participation directed toward the purpose of the community), context (further broken down into the following forms: implicit knowledge, *endoxa*, and constraints), and infrastructure (p. 143-145). For more background on online communities, see section 3.3.

As online communities are a relatively new phenomenon, the attempt to define exactly what they are may be difficult. Platforms are still being developed and the affordances they offer to users are being negotiated and renegotiated. An attempt to establish purpose within an online community (and any subsequent attempt to establish commitment as directed toward purpose) may be less relevant now than it was during the earlier stages of Web 2.0, and may be entirely tautological in nature. What if the purpose of an online community is simply to be a community? It is in part for this reason that the presumed operating variable, membership in an online community, is identified through member avowal.

### **2.2 Computer-mediated communication (CMC)**

Computer-mediated communication (CMC) describes interactions that exist due to the existence of communication technologies. McQuail (2005) defines CMC as, "any communicative transaction that takes place by way of a computer, whether online or offline, but especially the former," (p. 551). Although communication

technologies include more than the Internet, the Internet (and what it enables) will be the focus of this research. Much communications research on the Internet focuses on policies of Internet use, perceptions of Internet use, and cultural and social issues (Kim & Weaver, 2002; Cho & Khang, 2006). While the social or perceptual implications of CMC are vast, the synchronicity or asynchronicity of time or place is a common theme (Moon, 1999; Bot et al., 2002; Bradner & Mark, 2002). The implications of the location dimension of CMC are herein explored more thoroughly through the lens of Social Impact Theory.

### **2.3 Non-computer-mediated communication (NMC)**

Often CMC is researched in opposition to FTFC, or face-to-face communication. For this research, the term FTFC will be replaced by NMC, or non-computer mediated communication, when referred to generally (not when referred to as a test condition in other research described). The reason for this change centers on the desire to not misrepresent or privilege communication that occurs without communication technologies. Due to the relatively new accessibility of video chat programs, communicating face-to-face no longer necessarily implies NMC, and so the term NMC removes that implication. Furthermore, the relationship between the terms CMC and NMC sets CMC up as the default form of communication and NMC up as the exception. This relationship stands in opposition to the common perception of CMC as less usual. Lastly, NMC suggests nothing about the synchronicity (or lack thereof) of communication in time or space, unlike other potential terms like CLC (co-located communication).

## **3 Theoretical Background**

### **3.1 Social Impact Theory**

Social Impact Theory (SIT) was developed by Bibb Latané in 1981 as a framework for understanding the general rules that guide the formation of communities and relationships. Social impact refers to, as Latané notes, "the great variety of changes in physiological states and subjective feelings, motives and emotions, cognitions and beliefs, values and behavior, that occur in an individual... as a result of the real, implied, or imagined presence or actions of other individuals," (Latané, 1981, p. 343). Latané warns that SIT was not developed for its specificity or its ability to explicate the exact methods by which social impact is transferred from individual to another. SIT simply proposes that social impact is divided into 'social forces' (strength, immediacy, and number), and that the impact of each social force can be described mathematically.

Latané (1981) presents each social force and its foundational research, though he admits that most of his related data refers to his third social force. Number as a factor of social impact refers, most logically, to the amount of people that make up an influencing source. Latané argues that affective or cognitive impact on an individual increases as the influencing group grows in size. However, the impact of each influencing person is less than that of the person who came before. Latané explains this concept through an analogy: while the value of a person's first dollar is equal to the actual value of their 100th dollar, the impact of the 100th dollar is less than the impact of the first. Thus, the social impact of a group of 100 people is not one hundred times as large as the impact of one person. Latané expresses the logarithmic



component of strength through an equation, where " $I$ " is social impact, " $s$ " is a scaling constant, " $N$ " is the number of sources, and " $t$ " is a value less than one:  $I = sN^t$ . Research which, Latané concludes, is generally supportive of SIT and mostly supportive of his mathematical expression of group size involves a variety of both human and non-human behaviors, including restaurant tip size in relation to dining party size, crowding in laboratory rats, and conformity among students.

The other two social forces, strength and immediacy, are no less important, Latané (1981) asserts, although he presents far less supportive research. Both strength (ie. the status or power of an influencing source) and immediacy, or "the closeness in space or time and absence of intervening barriers or filters," (p. 344), are accounted for as Latané reports the effects of news events. Latané refers to his own research with Bassett, presented in 1976, which investigated all three social forces by presenting various false headlines and sample news stories to psychology students. Students were tasked with deciding how much newspaper column inches each story should be allotted. The status (or strength) of the subjects involved in each story seemed to have no affect on the students' decisions, but the number of subjects involved and the distance of the event (Columbus, near; Phoenix, far) did. Fewer column inches were devoted to events in Phoenix, and although the number of subjects involved increased column inches for both near and faraway events, the gap between the two sets widened as group size increased. Latané concludes that distance does not increase impact logarithmically, and later goes on to specify that impact, "will be an inverse function of the square of the distance between [two individuals]," (Latané et al., 1995, p. 798). However, it is not clear whether the gap in column inches devoted is actually due to immediacy rather than other factors, such as preconceived ideas about Columbus or Phoenix. The result could, perhaps, be more related to strength than Latané supposes.

Latané (1996) later redeveloped SIT as dynamic Social Impact Theory. Dynamic SIT conceives of social impact as an iterative process in which potentially randomly distributed attributes cluster over time based on, in part, physical distance through immediacy. Latané suggests that less popular attributes persist through minority subgroups. Thus, dynamic SIT proposes that these social forces are responsible for a bottom-up formation of culture through communication. As a result of Latané's redevelopment, this theory becomes primarily about patterns and societal groupings, cultural shifts and social commonalities. While it is possible that SIT is predictive on an individual level, dynamic SIT is more aptly studied on a group to group basis.

### **3.2 Distance as a Component of Immediacy**

Because SIT includes three social forces, much of the related literature that has been generated since Latané's introduction of the theory has, like Latané himself, focused on something other than immediacy. Again, much of this research devotes itself to group size (Mir & Zaheer, 2012), or studies SIT as a whole without isolating its components (Wu et al., 2011; Kwahk & Ge, 2012). However, another problem arises with much of the research on immediacy: immediacy combines several components. As noted previously, immediacy does not refer simply to distance. It refers to proximity in space and time, and, Latané notes, a lack of obstacles. This is a rather broad component, then, and can be studied in a variety of ways.

As could be expected, much research that *does* focus on immediacy does not single out distance as an important factor (Abbassi, 2012; Li, Lee & Lien, 2012; Kim

& Sundar, 2014). Early research regarding immediacy suggests that the related impact is limited to perception and not behavior (Mullen, 1985). Other related literature investigates time proximity more closely but does not conclude much about distance (Bos et al. 2002). In this sense, immediacy can be likened to one of the original five characteristics of media salient to Media Synchronicity Theory (Dennis & Valacich, 1999): immediacy of feedback. Immediacy of feedback refers to the speed with which a communication technology allows for feedback. For example, communicators over email provide feedback more quickly than communicators over telegram but less quickly than communicators over a text chat program. Of course, time proximity can certainly cause obstacles for communicators, but it makes investigating distance itself a tricky prospect.

Latané et al. (1995) presents research conducted in the early 1990s that supports decreased impact over distance that seems to remove time as a factor. They ask participants in Boca Raton, Florida to recount with whom they have spoken in the previous 24 hours about topics important to them, which were referred to in the study as memorable interactions. The researchers found that memorable interactions between individuals decreased over distance and, as predicted, the relationship between distance and memorable interactions was an inverse function of distance squared. The researchers present further similar investigations both in Shanghai and with American social psychologists, the latter of whom the researchers hypothesize might be less affected by distance than the average person. Neither cultural difference (Chinese participants) nor experiential differences (social psychologists with expansive academic networks) challenged SIT's predictive power.

As mentioned previously, Latané's (1981) reference to his supportive research on devoted column inches describes a test of distance, but makes no mention of the time component. It is unclear whether the events students were presented with took place at approximately the same times. More worryingly, however, is that there does not seem to be an attempt to separate distance from location. While this is somewhat addressed by Latane et al.'s (1995) investigation of memorable interactions, this is potentially a loaded way to focus on distance and has the potential to introduce another social force: strength. The researchers note that although interactions decrease over distance, the interactions with faraway individuals that participants did note were characterized by strong ties, such as good friendships or relationships with close relatives.

This may not be that much of a problem for Latané, especially in light of dynamic SIT. If social impact is a self-organizing process, then does it truly make a difference to the theory, as per Latané's 1976 investigation, that students near Columbus are more likely to care about what goes on in Columbus, know people in Columbus, have lived in Columbus, share a similar political identity to the majority of people in Columbus, etc.? Is it the geographical distance between the students and Phoenix that matters, or is it the psychological difference between the students and Phoenix? Is it possible that the students in the study might have devoted a significantly different number of column inches to another city equally as far away from them as Phoenix, like, for example, Calgary? Again, when focusing on dynamic SIT, this does not seem to matter much. Of course cultures will cluster in geographical space. But because Latané emphasizes a bottom-up clustering, there does still need to be an initial reason to believe that distance will cause these clusters.

In 1976 and even as of the early 1990s, communication technologies were fairly limited. Latané et al. (1995) surmise that the reasons for distance's power is due to several processes, including increased chance of future communication between

individuals. For example, students near Columbus could rightly expect that they are more likely to interact with Columbus residents than with Phoenix residents in the 1970s. Latané et al. also refer to Zipf's principle of least effort. They propose that participants might be relying on being able to maintain geographically closer relationships with less effort. With that in mind, the advent of what many often think of as Web 2.0 may have interesting implications for SIT. Advances in communication technology have changed how people think about interacting with faraway friends and relatives. It no longer takes any more effort (or money) to maintain a relationship with someone located 10,000 miles away than it does to maintain a relationship with someone located 1000 miles away. It is thus useful to focus on newer research regarding distance, of which there appears to be little.

Bradner and Mark (2002) investigated deception, persuasion, and cooperation using SIT as their foundation. They tested participants in Irvine, California in both a text chat condition and a video chat condition, and found that participants reacted more favorably toward individuals who they believed were located in Irvine than those they believed were located in Boston. However, again, there is the problem of confusing distance for location. It seems obvious that participants in Irvine would be more likely to relate to others in Irvine than individuals in Boston, though it does not necessarily say much about distance.

Similarly post-Web 2.0, but like Bradner and Mark before the popularization of many modern communication technology tools like smartphones and Skype, Moon (1999) presents a compelling study that focuses more (but not entirely) on distance rather than location. Their participants conversed with bots (although they were led to believe they were conversing with humans) located at what they were told were distances of 2.723 and 2723 miles. Unlike Bradner and Mark's (2002) and Latané's (1976) research, participants could not react to far distance individuals on the basis of their city. However, participants could certainly assume that near distance interlocutors were located in the same city as them at a distance of less than three miles. Furthermore, participants were Harvard undergraduates, who might have been likely to assume that individuals located less than three miles away were also Harvard students, which again introduces the problem of strength. It seems, then, that distance as a component of immediacy has been difficult to study, both through NCMC and CMC. Efforts to mitigate the potential for strength to influence results, as well as for location to be mistaken for distance, have been made in this research.

### **3.3 Online Communities**

In order to define online communities, Preece (2001) borrows from writer and critic Howard Rheingold, who is attributed with having coined the term "virtual community," (Virtual community, 2016). Rheingold described them in 1994 as, "cultural aggregations that emerge when enough people bump into each other often enough in cyberspace," (Preece, 2001, p. 348). This is a particularly poetic way to envision what happens on the Internet, but it implies a randomness that may not be quite accurate. Preece continues in her attempt to define online communities by looking at whether understandings of traditional, non-virtual, communities provide any insights. Ideas about community shifted after the industrial revolution, when people were no longer bound to their immediate surroundings, and Palloff and Pratt (1999) note that the Internet's popularity allows people to "redefine notions of community," (p. 25). This shift in understanding led sociologists to focus their study on the types of relationships people formed, which are often categorized as either

'strong-tie' relationships, typical of family groups, and 'weak-tie' relationships, more typical of special interest groups. It is the non-randomness of 'weak-tie' groups that seems to best characterize online communities.

In investigating word-of-mouth via online interaction, Brown, Broderick, and Lee (2007) also note the importance of tie-strength. Interestingly, their research indicated that the ties between people were less important to their subjects than were the ties between users and the websites they visited. Brown et al. also looked at online homophily, which is essentially the demographic similarity between users' identities in an online community. They found, again, that it was the 'actual textual content' of the site investigated rather than the users who supplied the content that demonstrated a "homophily of interests with the user," (p. 10). The researchers assert, then, that online communities may emerge almost completely without regard to demographic similarity. This research suggests that the technological structure and support offered to the community is of particular importance to its success. This supports another of Preece's (2001) approaches toward defining online community: an assessment of software. From this perspective, online communities can be conceived of as having a sense of spatiality, or telepresence, in addition to social or co-presence, eg. a feeling of togetherness (Ning Shen & Khalifa, 2008).

As Brown et al. (2007) note, identity has traditionally been understood as the glue that holds a community together. CMC generally provides for fewer modalities and social clues than does NCMC, and so grouping based on identity aspects like age or location is less automatic. Early research concluded that such an environment would lead to anti-social or harmful behavior (Siegel et al., 1986). Brown et al. (2007) argue that this does not appear to be so when it comes to online communities, perhaps due to the concept of Para-Social Presence (PSP). PSP assesses how well a given medium supports connection and interaction among social actors (Kumar & Benbasat, 2002) and is a reconceptualization of Social Presence Theory (Carlson & Davis, 1998). These media may be facilitating connection by providing other types of clues for individual users, like information about group identity.

Of course, each attempt at online community may not be particularly successful. Preece (2001) refers to the purely technical approach to online community of providing a system for interaction, like a chat function, but no support for its use, leading to "cyber ghost towns," (p. 348). This is a clear-cut case of no success, but other cases may not be so clear. Ning Shen and Khalifa (2008) refer to the intrinsic and extrinsic motivations users have for participating in online communities, including an attempt to satisfy instrumental needs. Thus, online communities might serve a purpose, which is the first in Preece's (2001) categorization of online community success and can be related to the quantity of activity within a given community. Preece's second determinant is interactivity, or thread breadth and depth. Her third determinant, which may be the most important in determining longevity, is reciprocity, or returning to the community what one takes from it. This leads to the fourth determinant, which is quality of contribution. The fifth refers to the number of people the community supports, and the final two determinants refer to policy: the level of civility and trustworthiness (information security and interpersonal trust). It may be the case that the online community itself defines what constitutes success or whether success in any measure is important to them.

While a given online community may or may not achieve some measurement of success, according to Johnson (2001), its existence is almost certainly limited. Johnson argues that online communities follow the same life cycle as traditional communities, which end with a termination phase, when goals are met. However, this

assumes that each community's goal is reachable. If a community's goal is more abstract, eg. promoting companionship, then the existence of the community is its own goal. With the existence of persistent social media platforms which act as hubs, might online communities, instead of terminating completely, morph into a different type of community to better suit the changing needs of their members? Social media may provide for a community permanence similar to the dynamic yet persistent nature of NCMC communities.

Johnson (2001) asserts that online communities are more fluid than NCMC communities and that social norms are less important. It seems more accurate, however, to say that social norms within an online community are negotiated on a group-to-group basis, or are perhaps dependent on their host platform. This process requires time (Squire & Johnson, 2000), and is perhaps the main goal of the second, or conflict, phase typical of communities (Johnson, 2001). Other differences between NCMC communities and CMC communities pertain to the types of norms that may emerge. Johnson refers to 'politeness syndrome' (Borthick & Jones, 2000), a phenomenon in which users are kind but dishonest, due to unfamiliarity. Although this may be true of NCMC as well as CMC, the continual addition of new members due to community fluidity may enhance this behavior. Further, Johnson references Palloff and Pratt (1999), who argue that introverts are more comfortable in online settings than extroverts, which perhaps allows online communities to subvert typical patterns of interaction.

Preece (2001) ultimately settles on describing online communities as, "any virtual social space where people come together to get and give information or support, to learn or to find company," (p. 348). While this definition seems broad enough to encompass the scope of possible group interactions that occur virtually, it still does not identify whether online communities differ in nature from offline communities. Jones (2004) warns not to privilege the idea of online communities, as a Network Theory approach makes clear that community members, while engaging in their networks, exist both online and off. Wilson and Peterson (2002) argue that online communities are simply cultural reproductions of existing social norms, and thus claims about the Internet's ability to spark societal transformation are likely exaggerations and the result of early anticipation, and social media researcher Marwick (2013) echoes this point. Audre Lorde's point about the futility of using the master's tools to dismantle the master's house seems apt (Lorde, 1984). However, much of this criticism came at a time before social media use and its structural support of user-generated content truly came to fruition. The criticism also seems to dismiss the aforementioned dissimilarities between online communities and traditional communities as incidental. Might online communities have become a tool themselves? If so, and if online communities have the power to transform cultural norms, the question remains: who wields the instrument?

### **3.4 Virtual Identities**

As noted, this research heavily relies on the idea of identity. There are a multitude of approaches to identity (Benwell & Stokoe, 2006), but at its core, identity, or identification, is the process of knowing who the self is, especially in relation to others (Jenkins, 2008). For many theorists, identity is an action, it is something we do or construct, and not something we simply have as part of an essential self. This can suggest some level of performativity, as is central to gender theorist Judith Butler's approach to identity, but identity as a process does necessarily suggest performance,

as Michel Foucault's approach demonstrates. For Foucault, the process of identification requires tapping into existing structures, and is thus a normative or colonizing act (Benwell & Stokoe, 2006). Ultimately, from at least a constructionist perspective and perhaps even from an essentialist or trait-like perspective, identity seems to beget action.

Identities can be personal, cultural, professional, etc. but group identity has generally been referred to as social, particularly as a result of Henri Tajfel's development of Social Identity Theory (Turner, Brown, & Tajfel, 1979). Social Identity Theory posits a number of processes, including social categorization, social comparison, and psychological distinctiveness (Tajfel, 1974). These differentiation processes, according to the theory, guide how individuals negotiate group membership and behavior. People can be lead toward positive or inclusive behavior, and simultaneously drawn toward discriminatory or hurtful behavior toward out-groups or individuals who are perceived as non-members. Intersecting these processes with CMC likely can potentially complicate these behaviors, as identities persistently bounce up against each other in virtual spaces and may or may reflect stability across multiple platforms.

Research on virtual identities tends to begin with the idea that virtuality implies information poverty. As a result of the earlier days of the Internet, virtual identities has, in the past, referred to text-based identities which are easily remolded, limitless, and lacking a necessary connection to non-virtual identity. The joke, "on the Internet, nobody knows you're a dog," (Steiner, 1993) comes to mind. Of course, the introduction of social media platforms has not entirely changed this possibility, the lack of opposable thumbs on dogs notwithstanding. Increased social media use has, however, popularized the expectation that online identities are at least somewhat consistent and representative of offline behavior. This expectation has, on occasion, had significant negative consequences for social media users who are also job seekers (Vorvoreanu, Clark, & Boisvenue, 2011).

Baym (2007) describes modern online interaction as organized across, "a complex ecosystem of sites," where users, "build connections amongst themselves and their sites as they do," ("Discussion", para. 1). Users who have interacted with each other within an online community on one platform might hope to connect in other virtual locations, which, depending on the platform, could lead to a clash of social identities. Facebook users may have encountered, for instance, the difficulty of simultaneously attempting to please both their grandparents who uses Facebook to keep in touch and their social activist friends, who may have differing ideas about Internet etiquette. While it is possible to segment audiences on some social media platforms, some of them lend themselves more toward consistency than others and may require more effort to maintain than an individual feels is worthwhile (Vorvoreanu, Clark, & Boisvenue, 2011). The line between 'real' and the virtual becomes more ambiguous and, for many people who engage in online communities, may feel like an imaginary distinction (Benwell & Stokoe, 2006). Furthermore, in contrast to early ideas about virtuality, many users may feel that the Internet provides an information richness that cannot be matched even in offline interaction. As previously referenced, Media Synchronicity Theory proposes a series of media characteristics, one of which is symbol variety (Dennis & Valacich, 1999). Through a combination of communication technologies, users can express their ideas in a number of ways that have no offline equivalent (eg. .gif, emoji, or the image macro).

Still, for many Internet users, the distinction between 'real' and virtual identities may remain perceptually relevant. Wilson and Peterson (2002) present the

idea of contextualized identities, which suggests that identities relate highly to the contexts in which they are salient. For users who do not consider themselves to be members of an online community, perhaps the identities that feel most salient are those that are primarily contextualized in the offline world, such as familial, cultural, or professional identities. Of course, these identities can still be thought of as group-based or social, and thus Tajfel's social identity processes may guide these users toward differentiation from strangers on the Internet. Strangers on the Internet are approached as unlikely to be members of these offline groups. From this perspective, the more geographically separated two individuals on the Internet are, the less likely they are to share offline identities. Thus Internet users who do not avow membership in an online community distinguish themselves from these strangers, potentially, by behaving less cooperatively with them or by feeling less persuaded by them. Conversely, for those who do consider themselves members of online communities, distance may not feel like an important metric for similarity. Perhaps there is a carryover from interactions within the online community to interactions without (see discussion of the "communication effect" in section 3.6).

There is, however, doubt that identity is as important as it has been historically purported to be. Jenkins refers to arguments by Martin and Malešević who warn not to confuse identity with behavior. Martin (1995) asserts that the concept of identity in politics is dangerous and claims that it "confuses the comprehension of reality," (p. 6). Instead, Martin prefers to conceptualize identity as choice, emphasizing that the process of identification is dynamic and individual. Malešević (Malešević & Haugaard, 2002) refers to the "near universal acceptance" of the concept of identity as a "normative straitjacket," (p. 195). Jenkins uses these criticisms of the concept of identity as a foundation for his warning: identity does not determine behavior. Jenkins further notes that an identity's salience must be made important in any given context in order for it to operate as a behavioral guide. In light of Social Impact Theory, perhaps connection or lack of connection over distance requires the salience of an identity that recognizes virtual interaction as inseparable from other interactions. Thus, this research will attempt to isolate identity as a member of an online community as a test condition.

### **3.5 Persuasion**

Interpersonal persuasion, as defined by Reardon and noted by HCI (human-computer interaction) researcher Wilson (2003, p. 537-538), refers to interactions between a small number of people, using verbal and nonverbal clues, for which the purpose is to produce a change in behavior or attitude on the part of at least one of the interlocutors. Reardon asserts that the difference between interpersonal persuasion and mass media persuasion is the presence of feedback and behavior coherence. Thus, research on interpersonal persuasion has often focused on using the feedback received to break down the components of persuasion, and distance has certainly remained a salient factor in research on both NCMC as well as CMC.

Albert and Dabbs (1970) focused on FTFC and persuasion by crossing speaker likeability with distance. Attention to the message was greatest at a middle distance, whereas closer and farther distances caused listeners to focus more on the speaker's appearance. The researchers refer to Edward T. Hall's concept of distance zones (Hall, 1990) as possible corroboration of their observations. Later research has investigated whether distance may play a similar role in CMC. Moon (1999) used the Desert Survival Problem to study whether perceived distance and response latency affected

how persuaded subjects were by what they believed to be human interlocutors (but were actually pre-programmed messages). Not only were subjects less convinced when they perceived their interlocutor as farther away, but they were most convinced when response latency was neither too great nor too small. This pattern is reminiscent of Albert and Dabbs' (1970) observations that the extremes distract from the message, as well as Bradner and Mark's (2002) study. Moon (1999) suggested that long latency before response might indicate deception whereas rapid response might indicate lack of thought. Most interestingly, Moon's results were replicated even when subjects knew they were conversing with a computer, which perhaps makes most sense when considered in light of Actor-Network-Theory (Sayes, 2014).

Distance clues as a causal factor for persuasion success may be related to differing ideas about how people process persuasive information. The heuristic-systematic dual-process model of persuasion (Guadagno & Cialdini, 2007) posits that interactants are persuaded or not persuaded through one (or perhaps both, on occasion) of two processes: centrally routed messages or peripheral clues. The central route model suggests a careful consideration of the veracity and logic behind a given persuasive message, and cogent messages are ultimately viewed favorably and are successfully persuasive. Use of peripheral clues, on the other hand, suggests a heuristic approach to persuasive information that emphasizes other contextual factors, such as positive or negative emotions the listener may have associated with the environment in which the message was heard (Petty & Cacioppo, 1984, p. 70). This dual-process seems, perhaps, to be a theorized version of what Albert and Dabbs (1970) observed.

Superficially, this is often understood as the distinction between "deep" and "shallow" reasoning (Lavine, 1999). However, there is evidence to suggest that the distinction may be deeper. In studying success rates of likeable and unlikeable communicators via written versus audio-visual messages, Chaiken and Eagly (1983) found that unlikeable communicators were more successful on paper. Guadagno and Cialdini (2007) suggest that this may mean that written messages are more likely to be processed centrally, and thus unlikeable communicators have something of an out when persuading in written form. Chaiken and Eagly (1983) also observed the natural corollary, which is that likeable communicators persuaded more successfully in audio-visual messages. Again, Guadagno and Cialdini (2007) interpret this to mean that audio-visual messages are more likely to be processed peripherally.

This might suggest that CMC over text is likely to be processed centrally, and that online communicators will focus on message coherence when considering persuasive information. However, in the absence of relevant knowledge, will listeners still rely on logic to process messages? If a message is a matter of opinion on a subject that is relatively unknown to a persuasion target, might the target still need to rely on context clues, such as the level of the perceived expertise of their interlocutor? As demonstrated by Moon (1999) and Bradner and Mark (2002), distance may matter here. Social media researcher Marwick (2013) notes, "in the absence of face-to-face cues, people will extrapolate identity and relational material from any available digital information... online personal ads were constructed with a hyper-aware self-consciousness because users knew that misspellings, cultural references, and even time stamps were likely to be scrutinized..." (p. 220). In other words, Internet users may fixate on clues that may or may not be relevant, and if something as trivial as a time stamp could affect readers, why should distance be any different? Interactants may interpret distance as a salient factor and may peripherally process that as relevant to a persuasive message. Their positive or negative perceptions of distance or



relationships over distance may guide how successfully they are persuaded by their text-based interlocutor. If this is the case, then communicators who have positive associations with distance communication, perhaps including those who self-identify as online community members, may be more likely to be persuaded by text-based messages communicated from afar.

The heuristic-systematic divide does not come, of course, without criticism. Kruglanski and Thompson (1999) argue that the true distinction is between easy-to-process information and difficult-to-process information. Each type can be either related to the message or external cues. The determining factor in persuasion effectiveness, for them, is motivation and ability. When motivation and ability are high, difficult-to-process information is persuasive, and the opposite is true when motivation and ability are low.

If it is true that distance affects persuasion; if it is true that message coherence is more important via written communication; if it is true that interactants are more likely to focus on presumably irrelevant factors like distance; if it is true that persuasion effectiveness is due to motivation; if any one or more of these interpretations are correct, then that suggests that persuasion via CMC is more difficult than persuasion via NCMC. According to Wilson (2003), this is not an easy supposition to confirm. Research on CMC is equivocal, but has trended toward a belief that early understanding of CMC persuasion as trickier than NCMC persuasion, due to reduced modalities, is mitigated by use over time (Walther & Burgoon, 1992), among other factors. Regardless, interpersonal persuasion between strangers may still be less effective overall over CMC.

Wilson (2003) further investigates potential persuasive strategies and their effectiveness over CMC versus NCMC and finds that the difficulty, or the perceived difficulty, may depend on the task. Strategies investigated include reward, punishment, emotion, and logic. These four strategies act as opposing ends of recurring taxonomies in persuasion research (Wilson, 2002, p. 1986). This investigation will not compare persuasion strategies. That said, persuasion strategy research has provided an invaluable background for experiment design and may provide insight on any observed patterns.

### **3.6 Cooperation**

As with persuasion, cooperation research often has the burden of defining exactly how to measure cooperation and how it differs from compliance. Generally, cooperation is defined as an active process toward developing solutions that satisfy mutual goals shared by two or more individuals, whereas compliance is not a particularly active process for at least some of the interacting individuals and suggests deference to authority (Swinarski, Kishore, & Rao, 2004). Trust is an important concept in this research, and the differences between trust in NCMC situations and CMC situations are often noted. Bos et al. (2002) tested subjects playing a modified prisoner's dilemma called Daytrader through four different mediums, including FTFC, videoconference, audio-conference, and text-chat. Text-chatters cooperated significantly less often than did subjects using other media and those communicating FTF. However, subjects in the other two CMC conditions overall performed as well as the FTFC subjects, but displayed two notable patterns similar to the text-chat condition: delayed trust and fragile trust.

Delayed trust refers to the increased cooperation rates over time, as previously noted regarding persuasion (Walther, 1992), and aligns with observations made by

Bradner and Mark (2002). Fragile trust is more complicated, and depends heavily on the levels of communication that persist or do not persist throughout social dilemma experiments (or, presumably, in general behavior). CMC conditions often led to end of game drop-offs in cooperation, generally the result of promise breaking. Bos et al. (2002) believe this observation is explained by subjects experiencing a 'deindividuation' of their interlocutors. Because CMC conditions allow for less immediacy than NCMC conditions, the humanity of their task partner(s) becomes less salient for the subject and thus inhibitions against betraying social norms are lowered. Perhaps of note is that the researchers noticed non-cooperation agreements, a sort of meta-cooperation that capitalizes on the phenomenon of deindividuation, most often via the least 'rich' medium, text-based chat.

Criticism of cooperation measurements in laboratory settings tends to begin with the obvious: the scenarios presented to subjects are contrived (Riegelsberger, Sasse, & McCarthy, 2003). Critics argue that cooperation 'in the wild' is much more complex and cannot necessarily be interpreted as the result of one process or another. In experimental settings, the stakes are generally lower (Henry, 2000) and participants are often strangers and hold no *a priori* knowledge of their interlocutors (Riegelsberger et al., 2003). Riegelsberger et al. thus posit that CMC requires more *a priori* trust than NCMC, as misunderstandings and disregard of social norms is more prevalent, and research substantiates this claim (Zheng et al, 2002). Further, the less rich the medium, the more trust is needed. Without that previously built trust, cooperation rates will be lower, and so CMC tests do not accurately predict how CMC interactants are likely to actually behave in, for example, a work setting in which actors will at least be able to assume institutional trust in their partner.

Another criticism of experimental settings is that subjects may feel a need to simply comply with what they believe researchers hope to see. In fact, researchers Biccheri and Lev-On (2007) argue that during social dilemma experiments, the 'communication effect' has a distinct impact on how subjects behave. The communication effect, as Biccheri and Lev-On (2007) claim, orients interlocutors toward 'pro-social norms', including promise-keeping. These norms invoke patterns of thought in subjects that lead to cooperative behavior, and the researchers investigate whether this effect carries over from NCMC to CMC. They conclude that while the effect does arise in CMC, cooperation is more difficult to achieve and is especially dependent on the medium used for communication. Biccheri and Lev-On refer to the difficulties of 'thinner' media, which likely refers to exclusively text-based communication. They assert that subjects, in unfamiliar settings, may focus on the "'poverty' of the normative environment," (p. 151), which may reduce rates of cooperation, as subjects seem to promise cooperation less often and to break promises more often, perhaps exemplifying deindividuation.

The 'poverty' of the unfamiliar setting may prove to hold some interesting implications in relation to one of the communication effect's key aspects. Researchers Orbell, van de Kragt, and Dawes (1988) tested cooperation and found that discussion about cooperative choices within a group caused subjects to behave cooperatively toward a second group. Orbell et al. dubbed this the carryover effect, which Biccheri and Lev-On (2007) count as an important aspect of the communication effect. However, it seems clear that in order for the carryover effect to apply, a subject would have to connect the second interaction (behavior toward the second group) with the first (discussion within the first group). For this to happen, the second setting would likely need to resemble the first. Thus, there is reason to believe that subjects who are more familiar with text-based discussion with a group, or a community, are more

likely to behave cooperatively in other text-based situations. Whether the carryover effect holds for CMC, as does the communication effect in general, is under investigation in this research.

### 3.7 Actor-Network-Theory

Actor-Network-Theory (ANT) was developed in the 1980s by Bruno Latour and Michael Callon and is generally treated as an exhortation to rethink power (Munro, 2009). It is useful to begin by understanding what is meant by networks. For Latour (2011), a network is an indicator that an object is not self-contained but requires, "a complex ecology of tributaries, allies, accomplices, and helpers," (p. 799) to be and to function. ANT rejects any divide between human and non-human agents and suggests instead that materials (as well as humans) can be thought of as actants (Tuomi, 2001). ANT theorists focus on the relationality or associations between actants and the resulting effects.

Tuomi (2011) describes ANT as supposing the symmetry of human and non-human actants, which can be substituted in for each other through the processes of translation and punctualization. For example, a larger network is translated into a spokesperson while a car can represent the series of complex actions required to produce it; the networks behind both the spokesperson and the car have been punctualized to form a single unit. As Fox (2000) notes, "ANT has taken the idea of force-relations further and analysed the interplay of technology, the objects it handles, and changes in knowledge and action, ie. learning," (p. 860). This perspective on the world seems highly relevant when applied to CMC, and perhaps sheds new light on Social Impact Theory.

Munro (2009) describes a scenario in which a hotelkeeper wishes for guests to return their keys to the front desk when leaving the hotel for the day. The hotelkeeper asks the guests first for compliance, and when that proves insufficient, places a large sign near the exit. The sign is also generally unsuccessful, and has the effect of turning the hotelkeeper into an obstacle. It is not until the keys are weighted and feel unwieldy that the guests consistently accord their actions with the hotelkeeper's wishes. The hotelkeeper goes from being an obstacle to a friend who relieves guests of the now unwanted key. From this perspective, identity is dynamic and relationships are the results of material and social combinations, referred to by ANT theorists as *agencement* (Munro, 2009).

As described earlier, social impact theorists posit several explanations for the problem of distance. Perhaps ANT and the concepts of translation and *agencement* can illuminate why distance interferes with behavior. What if distance can be viewed as an actant? For NCMC communicators, all of the complicated reasons behind why any two given people are located far away from each other are translated into distance, which becomes the punctuated end of the awareness communicators have of the process. Distance mitigates their identities, and while the two people might have been friends otherwise, location makes them strangers. This idea, however, becomes more complex because of CMC and other communication technologies. Communicators at a distance are no longer necessarily strangers, but their *agencement* still makes distance an actant. Each communicator's distance from their interlocutor stands in for cultural differences and knowledge; the farther away someone is from an interlocutor, the less the interlocutor believes that person is similar to them or has relevant knowledge. An interlocutor is simultaneously identified as an expert (by someone nearby) or an amateur (by someone far away).

However, online communities may disrupt the stability of distance as a reasonable measurement of relatability. Because ANT focuses on force, resistance against force is also a salient factor. ANT proposes that interactions overcome resistance on a micro level, which in turn leads to a larger, stabilized network (Law, 1992; Latour, 2005). Patterns of interaction, eg. distance, are stabilized and thus repeated. Because these interactions are repeated, they gain power on a societal level, which makes them prominent in the minds of the human actors who engage with the networks. But perhaps online communities resist distance as a stabilizing force. Tuomi (2001) claims, "social change therefore is very much about the struggle of reorganizing the resources and relations in the actor-network," ("Actor-network theory and reduction...", para. 5). Online communities may be in the process, then, of reorganizing the relationships human actors have with distance, as the sub-networks which distance has previously stood in for are broken down by CMC.

## 4 Hypotheses

The hypotheses presented below pertain to a series of small online tasks completed by participants with a task partner, each of which generated one or more scores (persuasion behavior: any change; persuasion behavior: agent match; cooperation behavior; persuasion perception; cooperation perception; distance perception). While completing the tasks, the participants were unknowingly divided into one of four experimental groups, which test two conditions: online community membership and distance from the task partner. Group 1 includes participants who are members of an online community and were told their task partner was at a distance from them of 5000 miles (OCF); Group 2 includes participants who are members of an online community and were told their task partner was at a distance from them of 50 miles (OCN); Group 3 includes participants who are not members of an online community and were told their task partner was at a distance from them of 5000 miles (NCF); Group 4 includes participants who are not members of an online community and were told their task partner was at a distance from them of 50 miles (NCN).

H<sub>0</sub>: The null hypothesis is that neither distance nor online community membership affects the following scores: persuasion behavior: any change, persuasion behavior: agent match, cooperation behavior, persuasion perception, cooperation perception, or distance perception.

H<sub>1</sub>: The far groups (OCF, NCF) will be less persuaded by and will cooperate less with their task partner than will the near groups (OCN, NCN). This concerns the following scores: persuasion behavior: any change, persuasion behavior: agent match, and cooperation behavior.

H<sub>2</sub>: The far groups (OCF, NCF) will perceive their task partner as less persuasive, less cooperative, and more distant than will the near groups (OCN, NCN). This concerns the following scores: persuasion perception, cooperation perception, and distance perception.

H<sub>3</sub>: The online community groups (OCF, OCN) will be more persuaded by and will cooperate more with their task partner than will the non-online community groups

(NCF, NCN). This concerns the following scores: persuasion behavior: any change, persuasion behavior: agent match, and cooperation behavior.

H<sub>4</sub>: The online community groups (OCF, OCN) will perceive their task partner as more persuasive, more cooperative, and less distant than will the non-online community groups (NCF, NCN). This concerns the following scores: persuasion perception, cooperation perception, and distance perception.

H<sub>5</sub>: The difference between the means for the OCF group and the OCN group will be smaller than the difference between the means for the NCF group and the NCN group for the following scores: persuasion behavior: any change, persuasion behavior: agent match, persuasion perception, cooperation behavior, cooperation perception, and distance perception.

These hypotheses are based on the expectation that the communication effect, specifically the carryover effect (Biccheri and Lev-On, 2007), should cause participants to liken completion of the tasks to other similar interactions. Participants involved in online communities will associate the tasks with their online experiences, and will thus be more likely to be persuaded, to cooperate, and to perceive their task partner as persuasive, cooperative, and near to them in distance. Thus, distance as a factor of Social Impact Theory (Latané, 1981) will be less pertinent for these participants.

## **5 Background for Experiment Measures**

### **5.1 Desert Survival Problem**

Testing persuasion can be a difficult task for researchers, as most persuasive ideas presented are likely to carry with them a host of preconceived beliefs that could obscure influence. Thus, as with other HCI research testing persuasion (Moon, 1999; Bradner & Mark, 2002) or other similar behaviors, (Fogg, 2002), this experiment employs the Desert Survival Problem. Often used as a team-building tool, (Rasmussen, 1982; Rae, Takayama, & Mutlu, 2012), the Desert Survival Problem provides a fictional scenario in which participants have crash-landed on a desert island and have located several items in the wreckage. The items must then be ranked by participants according to how useful they are considered to be to survival in the scenario. Participants can discuss their rankings and re-rank the items. The difference between the original ranking and the post-discussion ranking provides a measure of persuasion: the more disparate the rankings are, the more participants were convinced by their partner. For this research, the Desert Survival Problem was referred to as Island Survival & Rescue.

### **5.2 Prisoner's Dilemma**

As with the Desert Survival Problem, the classic game theory scenario (MacKenzie & Wicker, 2001), the prisoner's dilemma, has also been used by many HCI researchers to test, among other things, cooperation (Kiesler, Sproull, & Waters, 1996; Parise et al. 1996; Bradner & Mark, 2002). Although the game has been so widely used that several versions of it are easily recognized as simple modifications, the original fictional scenario presented to participants casts them as prisoners. The

prisoners have been arrested and charged, and are being interrogated individually about their crimes. If both prisoners confess, they will both receive a moderate sentence. If neither prisoner confesses, they will both receive a light sentence. If only one prisoner confesses, the confessor receives a very light sentence while the one who remains silent receives the maximum penalty. Often the game is played over a series of rounds, during which participants "cooperate" with or "defect" from their partner.

Researchers MacKenzie and Wicker (2001) describe two varying conditions in which the game has been played: *finite horizon* and *infinite horizon*. Finite horizon prisoner's dilemma games are those in which participants are aware of how many rounds they will be playing. Players often respond to this knowledge by defecting on the last round, as there are no further opportunities to be "punished" for defection behavior. However, because both participants are aware of this from the beginning, the decision to defect becomes more tempting even from the first round. The idea becomes: if the game will only end in defection, why cooperate at all? Infinite horizon removes this knowledge, which strongly impacts players' decision making. During an infinite horizon game, players tend to cooperate more often.

The prisoner's dilemma game has been criticized for its lack of real-world validity, especially because of its frequent use in research. Riegelsberger, Sasse, and McCarthy (2003) argue that the dilemma offers players incomplete information, as they are not usually given clues about *exogenous pay-offs*, or external reasons, like adherence to social norms, that a player might have for deciding to cooperate or defect. Henry (2000) criticizes laboratory dilemmas for their inability to match real-world consequence, and specifically notes small monetary incentives. However, this seems to assume that real-world scenarios necessarily have larger implications than laboratory scenarios, which may not always be the case. As per Riegelsberger et al.'s argument regarding exogenous pay-offs, neither participants nor researchers can know exactly what goes into a decision to cooperate or defect.

After completing a meta-analysis of 35 years' worth of prisoner's dilemma research, Sally (1995) found that communication during the game greatly increased cooperation, thereby implicating the communication effect (Bicchieri and Lev-On, 2007). Interestingly, when employing the prisoner's dilemma, Kiesler et al. (1996) found that participants were often willing to cooperate even when they knew their partner was a computer, especially during a text-only condition, as long as discussion was involved. However, participants broke promises of cooperation to computers more often than they did to humans. For this reason in particular, it may be important whether a player believes that their partner is a computer or a human. If the partner is a computer, the partner cannot benefit from cooperation when an actual prize is at stake. For this research, the prisoner's dilemma was modified and referred to as Contest Dilemma. The modifications are described in section 6.6.2.

## 6 Methods

In order to participate, participants first needed to complete a brief online survey. Most survey responders were further invited to participate in a small set of online tasks. Task participants completed their tasks in real-time using a text-based chat program. To complete each task, participants were paired with an agent who sent pre-written statements instead of another participant in order to ensure a consistent interaction. The agent was referred to as a task partner, and the task partner was said

to be located at either 50 or 5000 miles away from the participant. The methods related to each portion of participation are explained throughout section 6.

### **6.1 Participant Recruitment**

This research was advertised both online and offline as pertaining to online communication. Online, the research was advertised on Facebook, Twitter, Reddit, and on a special interest blog with a moderate-sized readership (the name of the blog is withheld to maintain participant anonymity). Offline, the researcher consulted personal networks to recruit participants and to look for assistance in recruitment. An information sheet about the research which invited participants to take part and instructed them on how to access the survey was printed and subsequently distributed at several locations in the United States, including a church, a meeting hall for an exercise group, and a gathering of medical professionals. In online and offline advertisements, participants were informed about the time commitment, the age limitation, the possibility of being contacted further about task participation, and the potential rewards for participation. Rewards for participation included one entry into a raffle for a \$25 Amazon gift card for completion of the survey, the chance of increasing entries into the raffle for the aforementioned gift card through task participation, and one entry into a raffle for a \$50 Amazon gift card for task participation.

In order to complete the survey, responders were required to submit a valid email address. After survey completion, each responder was contacted. Most responders were invited to participate further in the small set of online task. A small number of responders were not invited to participate further because of time constraints. Those invited were asked to provide their availability should they wish to participate further, and they were then scheduled according to their availability. Participants were informed of their task time and date and participation number as soon as they were scheduled and given the opportunity to reschedule if needed or to confirm the scheduled time and date. All communication during this time was conducted via email.

### **6.2 Participants**

Participants were those who had chosen to respond to the recruitment messages by clicking or navigating to the available link. Because the survey was only available in English and task participation was conducted only in English, participation was limited to people who are somewhat fluent English speakers older than eighteen years. Because it was not considered relevant, and because there was a high priority on keeping the survey short and reducing potentially influencing or confusing information, questions about demographic information like age, gender, and occupation were omitted. The only demographic information collected was a general location. This information was collected mostly in order to provide credibility during task participation. Survey responders (198) lived in a total of eighteen countries, and task participants (64) lived in a total of nine countries, including: Australia, Canada, England, Finland, France, Germany, the Netherlands, Sweden, and the United States.

### 6.3 Survey

The survey used in this experiment was created using Google Forms. Immediately upon navigating to the survey, participants were informed of the Terms of Participation and Consent. Terms included, for example, the eighteen and older age limit, an explanation of the Amazon gift card raffles, and consent to be contacted further upon completion of the survey about task participation. By continuing on to the next page, responders confirmed that they understood and agreed to the terms.

In addition to location information, survey responders were asked to answer five questions relating to online community membership. The questions related to whether the responder considered themselves a member on an online community, and if so, on what platforms (Facebook, Twitter, etc.), in what ways (text chat, email, etc.), and how often (daily, more than an hour; almost daily; etc.) they interacted with online community members.

Following the questions about online community membership, survey responders were presented with Island Survival & Rescue. Responders read a scenario that described a crash-landing on a desert island and listed eight items that they and one other passenger had found. They were asked to then rank the items or set of items (3 airplane blankets, 1 book of matches, 1 canteen of water, 1 flashlight, 1 life raft, 1 sectional air map, 1 single blade pocket knife, 1 standard first aid kit) from most to least important to survival and rescue. Lastly, responders were asked to submit a valid email address. For a fuller look at the survey, see the appendix.

### 6.4 Experiment Conditions and Groups

Each participant was assigned to one of four groups: OCF ( $n = 16$ ), online community group, far (5000 miles); OCN ( $n = 16$ ), online community group, near (50 miles); NCF ( $n = 16$ ), no online community group, far (5000 miles); NCN ( $n = 16$ ), no online community group, near (50 miles). Participants who affirmed membership in an online community were assigned to one of the first two groups. Participants who did not affirm membership in an online community were assigned to one of the second two groups. Participants were assigned to either a near or far group based on the order of having scheduled them, ie. the first online community group participant scheduled was assigned to the far group, the second to the near group, the third to the far group, and so on. All task participation was text-based only, using a chat program which will be described in section 6.5. Using voice or video would have complicated the experiment past the point of workability and might have made participants, especially those not involved in online communities, less likely to agree to be involved.

### 6.5 Tasks and Chat Program

The chat program used for this research was accessible via browser at [stinto.net](http://stinto.net). Stinto was chosen for several reasons. The first was its ease of use, as joining a chat room through Stinto is as simple as clicking on a link and choosing a username. The second was that it did not indicate whether any user was typing at a particular time. This was deemed necessary in order to provide credibility for the pre-written responses. Lastly, Stinto allowed existing conversations to be copied, which allowed for the reprocessability of each task session.

For every instance of task participation, two new temporary and private chat rooms were created using Stinto. Participants were sent a link to the first chat, the



OCCR2 chat room, via email ten minutes before their scheduled task time. They were instructed to join the chat by clicking on the link at their scheduled task time. In this email, participants were informed of their task partner's approximate distance, which was either 50 or 5000 miles away from them. Each participant was given a Participant ID, which they were asked to use as their chat username. Participant IDs followed this pattern: P391##, where the final two numbers could be any number from 01 to 99 (excluding 32, as P39132 was the task partner's designated ID). This chat was subsequently referred to as the "first chat window" and included only one user in addition to the participant: a monitoring researcher named OCCR2.

After joining the OCCR2 chat room, participants were greeted by the researcher and instructed on the rules of task participation, which included talking to their partner only about the tasks and forbade insulting behavior. Participants were then sent a second link to a Stinto chat room, the OCCR3 chat room, referred to during task participation as the "second chat window". Upon joining the OCCR3 chat room, participants were introduced to their task partner and again informed of their task partner's approximate distance, either 50 or 5000 miles. All interaction between participants and task partners took place in the OCCR3 chat room. In addition to the participant and their task partner, a researcher with the username OCCR3 was present and responsible for mediating the tasks. After a brief introduction period, Task 1 was introduced. Throughout Tasks 1 and 2, the task partner supplied only the pre-written statements and minimal responsive comments, such as "Yeah", "Haha", "Not sure", etc. This was done to humanize the task partner and encourage more communication from the participants.

Task 1 was Island Survival & Rescue. Participants were re-introduced to the scenario and items presented to them in the survey. They were reminded of their item ranking and presented with their task partner's item ranking. They were then informed that they would be given one minute to discuss each item, its importance to survival and rescue, and should they prefer to do so, their rankings. After each item was discussed, participants were asked to rank the items again, either in the same order as their previous ranking or in a new ranking, but still according to what they believed was most to least useful in the scenario. Participants were informed that they should submit this new ranking to the OCCR2 chat room.

Task 2 began immediately after. Participants were introduced to the rules of Contest Dilemma. Four one-minute rounds occurred during which participants had the opportunity to discuss their decisions with their task partner. At the end of each round, participants were instructed to type either "cooperate" or "defect" privately into the OCCR2 chat room. They were then informed whether their task partner had cooperated or defected. Task 3 occurred thereafter in the OCCR2 chat room: participants were asked three questions about task participation, which are described in section 6.6.3. Finally, participants were thanked and asked how they preferred to be debriefed. Participants could choose to be debriefed immediately through the OCCR2 chat room, via email, or through both the chat room and email.

Significant consideration was given task order and structure. Firstly, it was deemed appropriate to hold Island Survival & Rescue before Contest Dilemma for several reasons, including logistics. Island Survival & Rescue took more time to complete and demanded more engagement of participants. If it had occurred after Contest Dilemma, participants might have lost motivation to discuss and re-rank the scenario items. This was less of a concern for Contest Dilemma, which demanded a lower amount of discussion and required only a decision to cooperate or defect. The second reason regarded emotion; Contest Dilemma had a greater likelihood of

creating extremely positive or negative emotions that might have affected Island Survival & Rescue if the task order had been reversed. Finally, Island Survival & Rescue was deemed more likely to establish the task partner as human instead of a computer. Finally, the decision was made to present only an infinite horizon version of the prisoner's dilemma. This was done in order to decrease possible strategic advantages for participants familiar with the dilemma and because the task partner automatically cooperated each round, which is more consistent with infinite horizon behavior.

## 6.6 Measures

### 6.6.1 Island Survival & Rescue

As described in section 6.3, survey responders were presented with the Desert Survival Problem. This was done in order to ensure that an accurately rearranged ranking could be generated before task participation. Items were consistently re-ranked in the following pattern: GFEHCBAD. This means that the item ranked by each survey responder as #1 (A) was always re-ranked to position #7, and so on. This new ranking was presented as the way any given participant's task partner had ranked the items while completing the survey. If an item was ranked by a participant as among one of the most useful four items, it was necessarily re-ranked to a bottom four position. Positive and negative persuasive responses were pre-written for each item. The task partner sent a positive response for each item ranked in the bottom half by the participant and a negative response for each item ranked in the top half by the participant. For example, if the participant had ranked the life raft in the bottom half, the task partner sent this message:

*Oh, the life raft seems very important to me. If we see a ship in the distance, the life raft at least gives us a shot at getting to it! Otherwise, we could definitely use it to make a shelter.*

Conversely, if the participant had ranked the life raft in the top half, the task partner sent this message:

*I get why the life raft seems good, but in the end I just think it gets us nowhere. With the pilot unconscious, we might not even know where we are, much less where we'd float to.*

After being provided one minute each to discuss each item with the task partner, the participant was asked to re-rank the eight items and submit the new ranking privately to the OCCR2 chat room. The new ranking was compared both to the participant's original ranking and to the task partner's ranking, generating two integers (persuasion behavior: any change; persuasion behavior: agent match) on a scale from 0 (no change from original ranking; no correlation with task partner ranking) to 32 (complete change from original ranking; complete correlation with task partner ranking).

Persuasion behavior: any change was measured in order to locate all changes made, even if those changes preserved rank number differences; for example, a participant who ranked the canteen of water in position #7 might have been convinced by their task partner that the canteen was extremely important and then might have re-ranked it to position #1, even though that task partner may have only ranked the

canteen at position #4. Measuring persuasion behavior: any change makes it clear that a large change was made in this example, as this change is represented by a six. However, the comparison between both the participant's original ranking and their task partner's ranking for the canteen of water and the participant's new ranking and their task partner's ranking for the canteen of water gives a three. Thus the change is not detected by the second measure, persuasion behavior: agent match. Instead, persuasion behavior: agent match locates when participants were specifically persuaded to align their ranking to their task partner's when re-ranking items.

### 6.6.2 Contest Dilemma

During Contest Dilemma, participants either cooperated with or defected from their task partner over a total of four rounds. Participants were informed that they had the opportunity to build up entries into the \$25 Amazon gift card drawing through this task. They were informed that the decision to cooperate would share additional entries between the participant and their task partner (if the task partner also cooperated) or give away additional entries to the task partner (if the task partner defected). Conversely, a decision to defect would share a reduced total number of entries between the participant and their task partner (if the task partner also defected) or would "steal" additional entries from the task partner (if the task partner cooperated).

It was not known to the participants before each round, but the task partner automatically cooperated every round. The task partner also sent each participant the same set of four responses, one per round, which expressed an intention to cooperate. For example, during the first round, the task partner wrote, "Should we cooperate?" Participants were given one minute per round to discuss their decisions and then asked to submit their decision in the OCCR2 chat room. Participants were told that both they and their task partner would also privately be informed of the other's decision. This task generated one integer between 1 and 4, which represents the amount of times the participant cooperated with their task partner over four rounds.

### 6.6.3 Scale questions

In order to measure perception, participants were asked three scale-based questions after completing Island Survival & Rescue and Contest Dilemma. The questions were:

*On a scale from 1-10, 1 being very far and 10 being very near, how far away did you feel your task partner was from you?*

*On a scale from 1-10, 1 being not at all persuasive and 10 being very persuasive, how persuasive did you feel your task partner was while discussing items during Task 1, Island Survival & Rescue?*

*On a scale from 1-10, 1 being not at all cooperative and 10 being very cooperative, how cooperative did you feel your task partner was during Task 2, Contest Dilemma?*

Each question generated one integer.

## 6.7 SIT Controls

As described in sections 3.1 and 3.2, much research related to Social Impact Theory focuses on the non-distance social forces, which are the size of the influencing group and the influencer's strength (the status or power of the influencer). This research was designed to minimize or eliminate interference from these social forces. Firstly, it was made clear to participants that their task partner was an individual. This detail was expressed while scheduling task participation and during task participation in several ways. First, the task partner was always referred to as a singular entity. Second, a singular distance was provided to each participant for their task partner. Lastly, during task participation, the entities involved were listed in the "Chatters Online" section of the chat program, and the only names listed were the participant (P391##), the agent (P39132), and the monitoring researcher (OCCR3).

Strength as a social force was more complicated to account for. Interlocutors are likely to form opinions about the status of their interacting partners based on very little information. Because of the necessity of providing the same textual inputs for each participant, it was considered important that the pre-written responses suggest very little about the task partner/agent. Responses were written with minimal slang and Internet-specific phrasing or abbreviations, standard spelling, standard punctuation and capitalization, and minimal but responsive use of emojis. This was done to minimize the likelihood that participants would develop opinions about the age, educational status, or gender of their task partner (Marwick, 2013). Based on time constraints, responses sent during task participation needed to be quick. Thus, the pre-written responses were sent, consistently across task participation, as quickly as it was deemed possible to have written them at a reasonable speed so as to avoid implications that might have related to age or ability. Finally, because a large concern regarding much previous SIT research is that participants may have biases about certain places, this experiment tested participant behavior and perception using a distance and not a place. This was also necessary for logistical reasons, as the participants were located in many different countries.

## 6.8 Ethical Considerations

As with any experiment involving human participants, the ethics behind the experiment design are essential to consider. Here, there were two major potential issues that stood out, the first of which was money. Offering any kind of reward for participation can create a dynamic for potential participants in which they feel an obligation to participate beyond simple personal interest. The likelihood of this dynamic manifesting was intentionally mitigated by stating clearly in all recruitment messages that rewards for participation were not guaranteed but that all participants would be entered into gift card drawings.

The second and likely more relevant ethical consideration was related to the expectations participants may have had about task participation based on the information given to them before task participation. In order to preserve distance as the relevant variable, it was necessary that participants believed that their task partner could have been located any distance away from them. To that end, participants were informed simply that their task partner was a person who had completed the same survey they had. Although this was not a lie, this likely (and intentionally) guided participants into the assumption that their task partner was simply another participant. Following task participation, all participants received debrief information. Therein it

was made clear to all participants that they had not completed their tasks with another participant but with an agent, and that the responses given by the agent had been pre-written.

Responses to the debrief information varied, and some of these responses supported the expectation that participants would have preferred clearer information. Some participants reported disappointment that their interactions during task participation had not been "real". Unfortunately, due to the nature of the experiment, this was not possible to avoid. It was simply not feasible, considering the varied locations at which each participant reported living, to expect participants to believe that an agent involved with the experiment might have lived so near to them. Furthermore, although the task partner being an agent should not have affected distance as a variable (as described in sections 3.5 and 3.7), it might have affected cooperation behavior. Put another way, what reason would participants have had to cooperate during the Contest Dilemma task if they knew their task partner could not actually benefit from their cooperation? Because the information shared during task participation was not likely to be of a sensitive nature, because participants were quickly informed about the true identity of their task partner, and because task behavior led only to a small probability increase of any given participant winning a participation reward, conducting the experiment in this way ultimately seemed reasonable and unlikely to cause distress.

## **6.9 Limitations**

The most important limitation on this research was time. On the research side, conducting task participation required a minimum of 40 minutes per participant, which limited the size of each group. Furthermore, each participant devoted at least 20 minutes to task participation, in addition to the time it took them to complete the preceding survey. As mentioned, participants were promised a chance to win one of two gift cards in order to compensate for their time. Even still, far less than half of survey responders responded to messages inviting them to participate in the tasks, likely in large part due to the time they would need to set aside in order to participate and the low likelihood of any one participant winning a gift card. Lastly, this research was limited by the necessity of each participant to be a fluent or near-fluent English speaker, which certainly narrows the scope of the results.

## **6.10 Statistical Analysis**

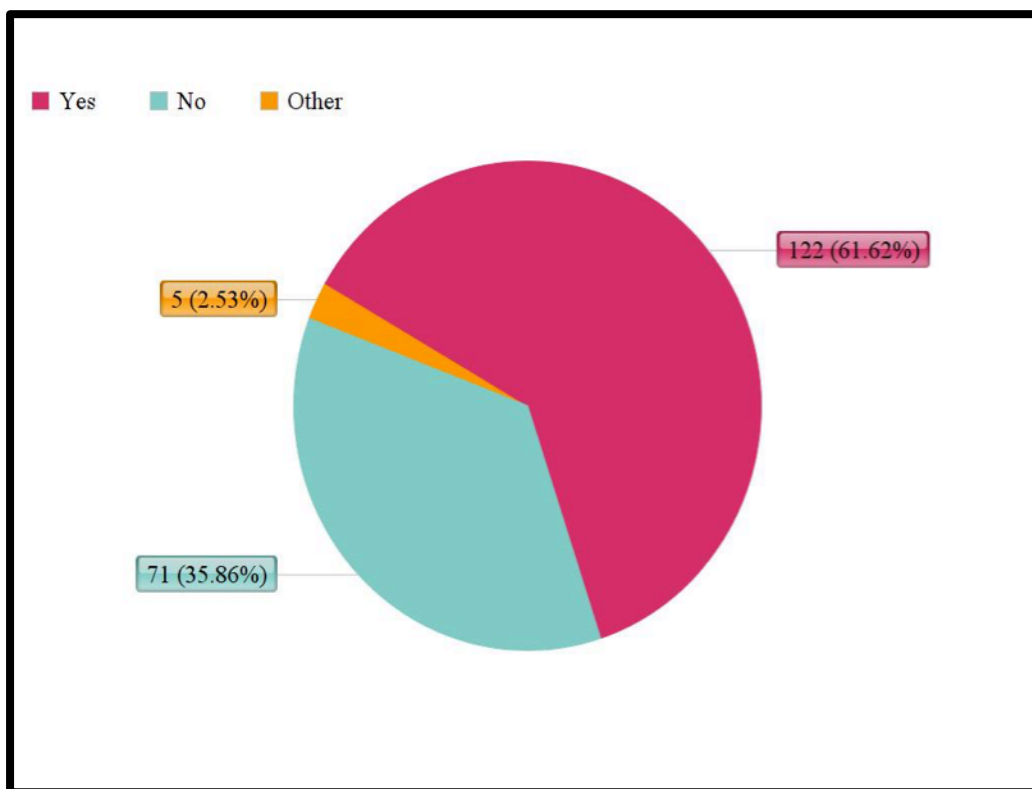
The data collected was quantitative in nature. In order to determine whether the results meet statistical significance, a series of tests were conducted. One-way ANOVAs were conducted to analyze mean difference on parametric data when comparing four groups to each other. When comparing two groups to each other, parametric data was analyzed using independent-samples t-tests. Mann-Whitney tests were conducted to analyze mean difference on non-parametric data. When relevant, Pearson's correlation tests were conducted.

## 7 Results

### 7.1 Survey Results

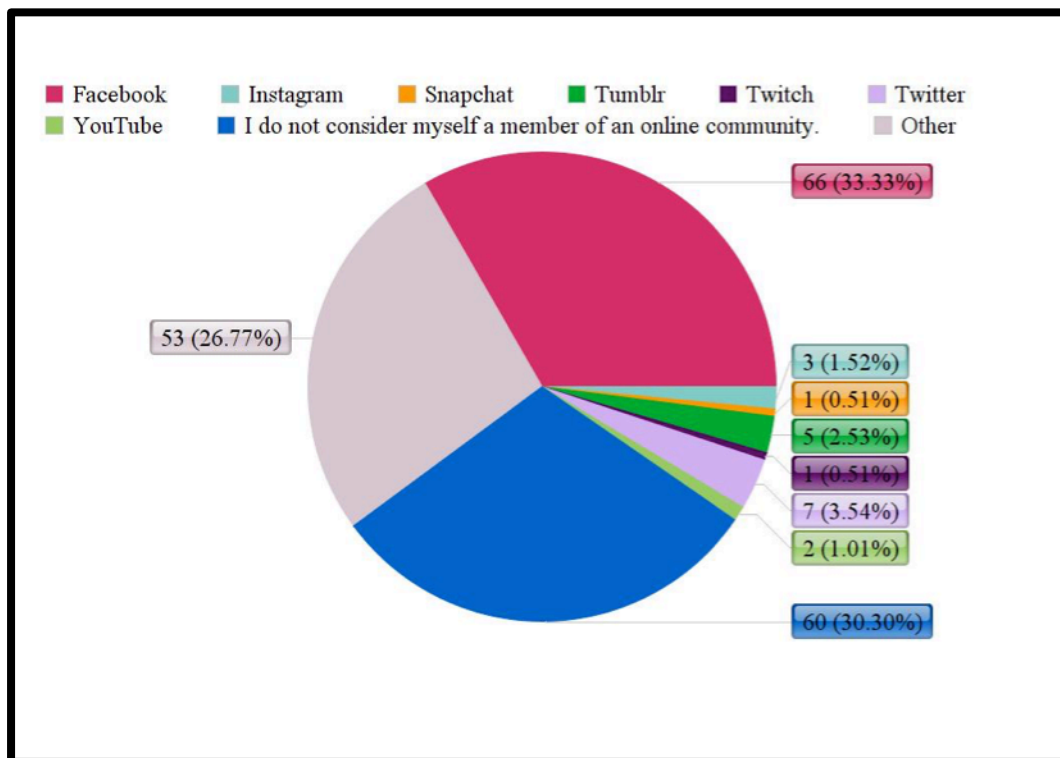
A total of 198 individuals responded to the survey. For a breakdown of responders according to online community membership, see Figure 1. For the category "Other", responders filled in another option. Most of those who selected "Other" used the field to refer to themselves as a lurker: "mostly lurk", "Lurker (reads but does not interact)".

**Figure 1**  
**Survey Responder Breakdown (Online Community Membership)**



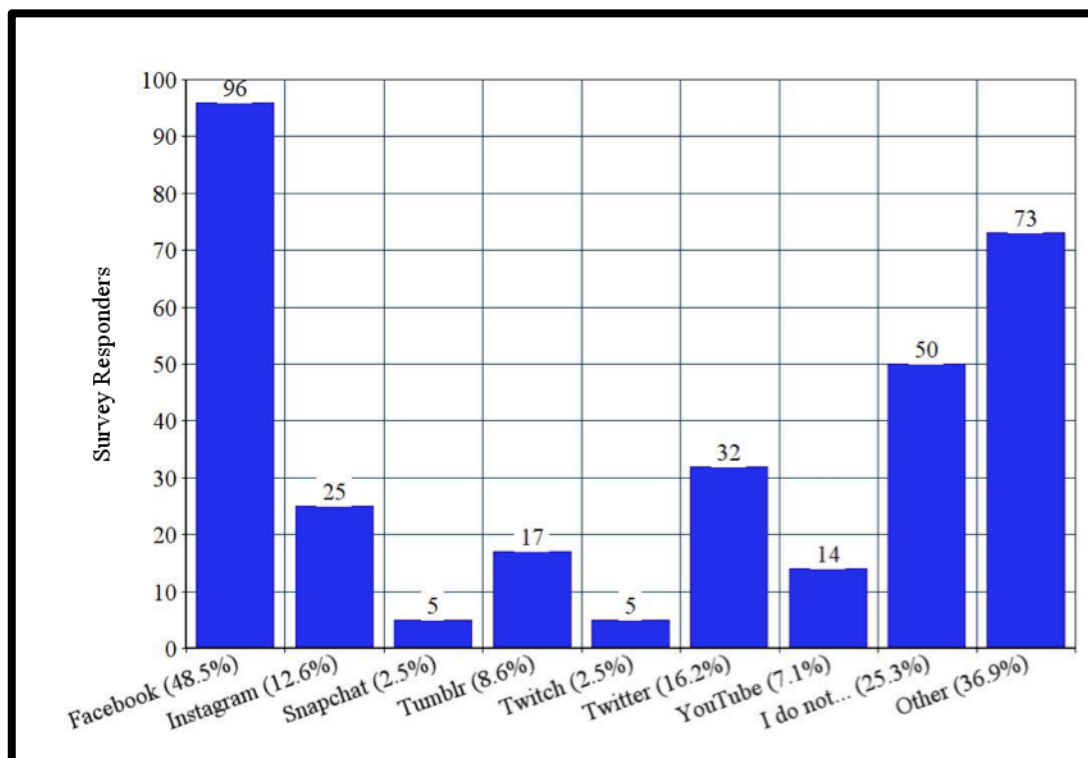
See Figure 2 for a breakdown of the primary platform on which responders interacted with their online communities. This is the platform on which responders interacted most often with their communities (or, in some cases, with others who are not part of a shared online community). Note that the total number of responders who selected "I do not consider myself a member of an online community" does not match the number who selected "No" in Figure 1. For the category "Other", responders filled in another option. Many of those who selected "Other" used the field to mention a blog, a forum, or a gaming community.

**Figure 2**  
**Survey Responder Breakdown (Primary Platform)**



See Figure 3 for a breakdown of all platforms used to interact with online communities by responders. These are the platforms on which responders interacted with their online communities (or, in some cases, with others who are not part of a shared online community) in any capacity. Responders could select as many options as were relevant. Note that the total number of responders who selected "I do not consider myself a member of an online community" (shortened to "I do not..." for Figure 3) is considerably lower than the number of responders who selected "No" in Figure 1 and somewhat smaller than the number of responders who selected "I do not consider myself a member of an online community" in Figure 2. For the category "Other", responders filled in another option. Many of those who selected "Other" used the field to mention a blog, a gaming community, another platform like LinkedIn or Reddit, other communication technology-based methods like texting or email, or, in several cases, NCMC.

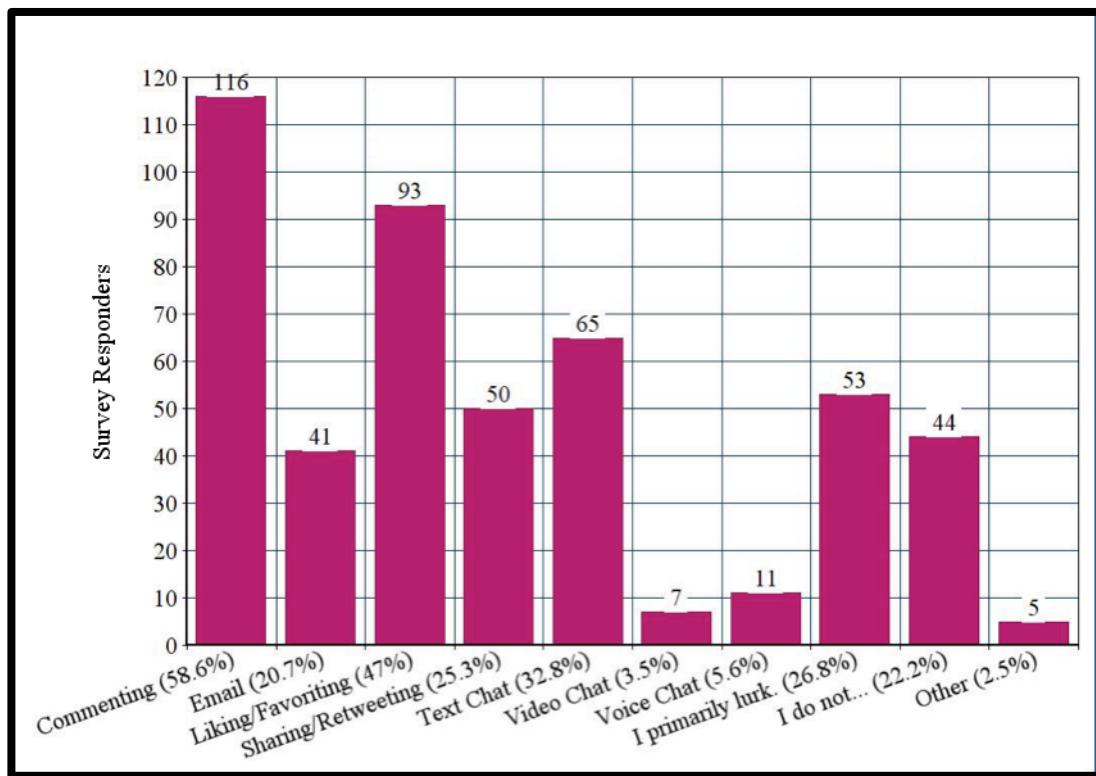
**Figure 3**  
**Survey Responder Breakdown (All Platforms)**





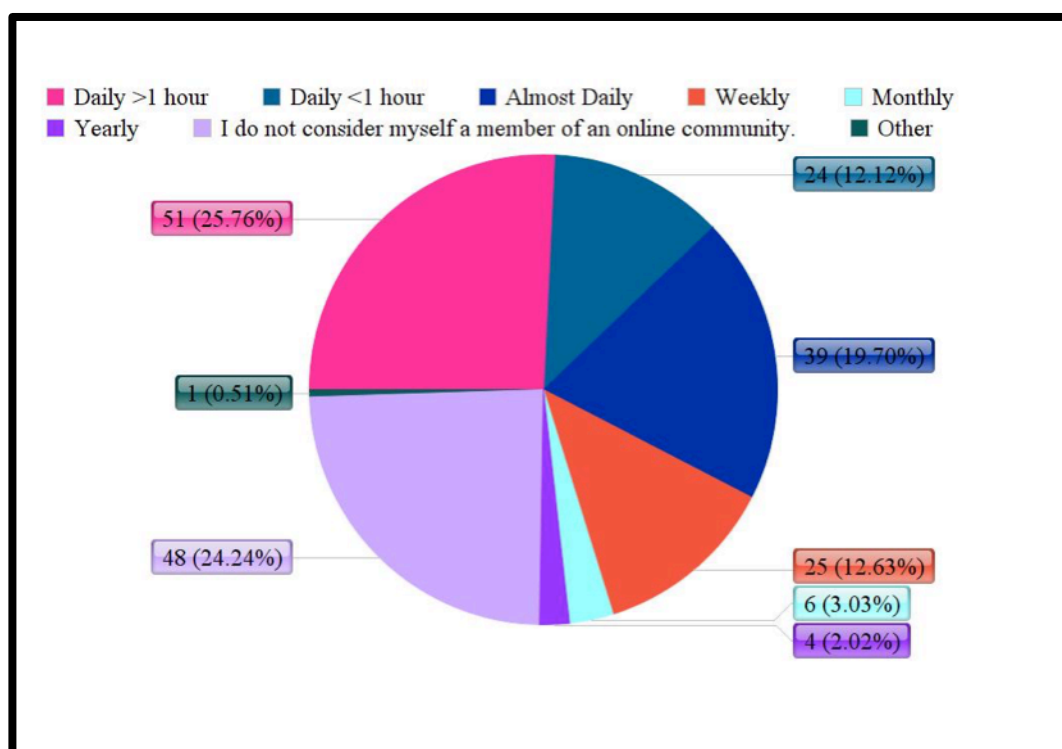
See Figure 4 for a breakdown of the communication methods responders listed when interacting with their online communities (or, in some cases, with others who are not part of a shared online community). Responders could select as many options as were relevant. Note that the total number of responders who selected "I do not consider myself a member of an online community" (shortened to "I do not..." for Figure 4) is considerably lower than the number of responders who selected "No" in Figure 1, and somewhat smaller than the number of responders who selected "I do not consider myself a member of an online community" in Figures 2 and 3. For the category "Other", responders filled in another option, which in this case included, for example, moderating and posting.

**Figure 4**  
**Survey Responder Breakdown (Methods of Interaction)**



See Figure 5 for a breakdown of the time spent by responders interacting with their online communities (or, in some cases, with others who are not part of a shared online community). Note that the total number of responders who selected "I do not consider myself a member of an online community" is considerably lower than the number of responders who selected "No" in Figure 1, somewhat smaller than the number of responders who selected "I do not consider myself a member of an online community" in Figures 2 and 3, and minimally larger than the number of responders who selected "I do not consider myself a member of an online community" in Figure 4. For the category "Other", responders filled in another option, which in this case included only "once in a while".

**Figure 5**  
**Survey Responder Breakdown (Time Spent on Interaction)**



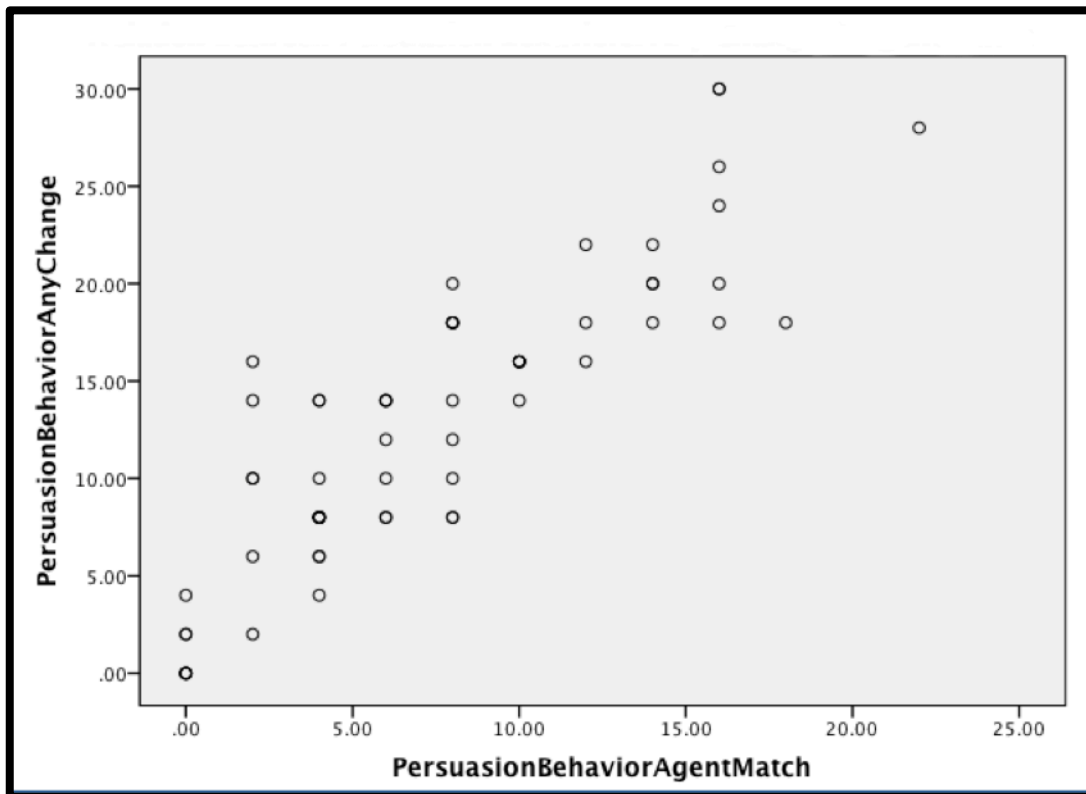
## 7.2 Island Survival & Rescue

The first number generated during the Island Survival & Rescue task represented the difference between each participant's original item ranking and their new item ranking (persuasion behavior: any change). For this, a one-way ANOVA was used to compare how persuaded participants were to change their item rankings at all after discussing the items with their task partner during Task 1. The alpha level was set to .05 for all of the statistical tests. This test compared all four groups to each other: OCF ( $M = 11.25$ ,  $SD = 8.03$ ,  $Mdn = 9$ ), OCN ( $M = 12.13$ ,  $SD = 7.61$ ,  $Mdn = 11$ ), NCF ( $M = 10.88$ ,  $SD = 6.93$ ,  $Mdn = 12$ ), and NCN ( $M = 16.75$ ,  $SD = 6.44$ ,  $Mdn = 18$ ). This did not meet statistical significance:  $F(3, 60) = 2.23$ ,  $p = 0.094$ .

The second number generated during the Island Survival & Rescue task represented the difference between each participant's new item ranking and the item

ranking of the their task partner (persuasion behavior: agent match). There was a strong positive correlation between the first number (any change at all) and the second number (change to match the agent), and this did meet statistical significance: Pearson's  $r(62) = .87, p < 0.001$ . This means that participants, for the most part, changed their item rankings based on their task partner's opinions and not based on new opinions generated since the original item ranking. See Figure 6 for a scatter plot depiction of the correlation between persuasion behavior: any change and persuasion behavior: agent match.

**Figure 6**  
**Correlation Between Persuasion Behaviors: Any Change & Agent Match**



For persuasion behavior: agent match, a one-way ANOVA was used to compare how persuaded participants were to match their new item ranking to their task partner's after discussing the items with their task partner during Task 1. This test compared all four groups to each other: OCF ( $M = 6.63, SD = 4.83, Mdn = 7$ ), OCN ( $M = 6, SD = 5.32, Mdn = 5$ ), NCF ( $M = 6.63, SD = 4.66, Mdn = 6$ ), and NCN ( $M = 10.13, SD = 6.04, Mdn = 9$ ). The mean differences did not meet statistical significance:  $F(3, 60) = 2.06, p = 0.116$ .

Participants were also asked how persuasive they believed their task partner to be. There was a weak positive correlation between persuasion behavior: any change and how persuasive participants perceived their task partner to be, and this did meet statistical significance: Pearson's  $r(62) = .29, p = 0.021$ . There was a weaker positive correlation between persuasion behavior: agent match and persuasion perception, and this did not meet statistical significance: Pearson's  $r(62) = .19, p = 0.133$ . To determine whether any group perceived their task partner as more persuasive than any

other, a one-way ANOVA was conducted: OCF ( $M = 6.38$ ,  $SD = 1.63$ ,  $Mdn = 6$ ), OCN ( $M = 6.75$ ,  $SD = 1.95$ ,  $Mdn = 7$ ), NCF ( $M = 5.06$ ,  $SD = 2.43$ ,  $Mdn = 6$ ), and NCN ( $M = 5.88$ ,  $SD = 2.9$ ,  $Mdn = 7$ ). However, this did not meet statistical significance:  $F(3, 60) = 1.65$ ,  $p = 0.19$ .

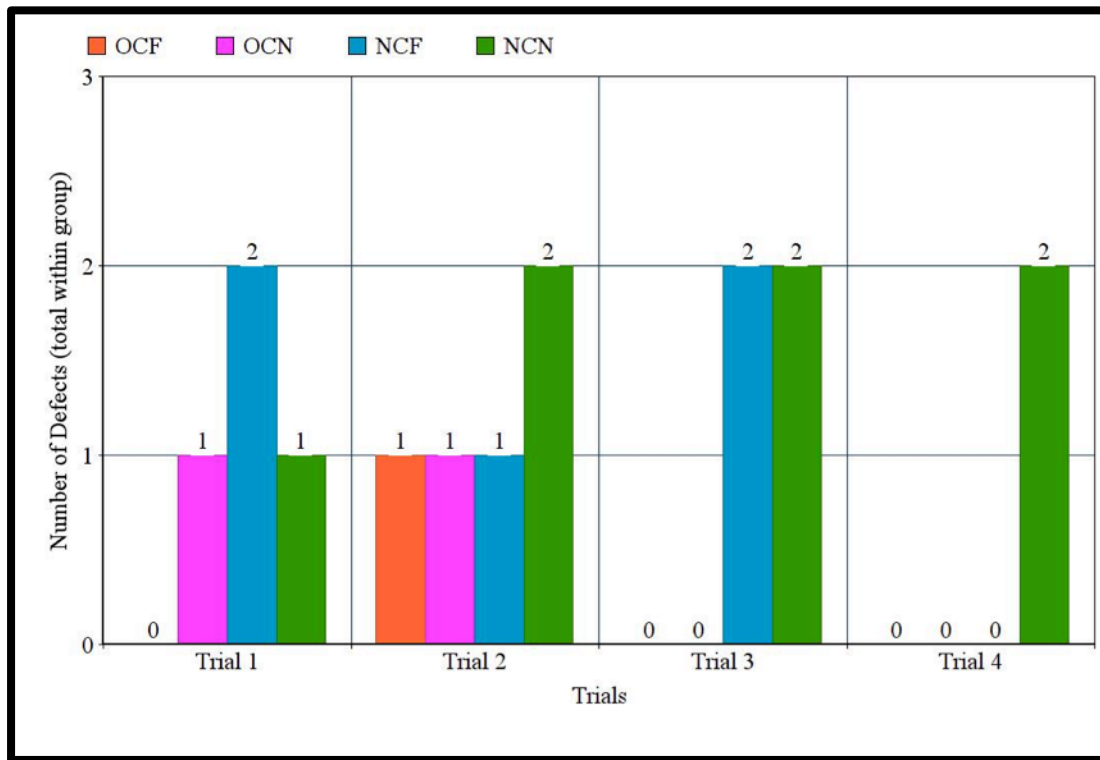
To test whether persuasion behavior (any change; agent match) or persuasion perception were affected solely by distance, independent-sample t-tests were conducted comparing both far groups (OCF and NCF) to both near groups (OCN and NCN). For persuasion behavior: any change, the mean difference between the far groups ( $M = 11.06$ ,  $SD = 7.38$ ,  $Mdn = 10$ ) and the near groups ( $M = 14.44$ ,  $SD = 7.32$ ,  $Mdn = 14$ ) was not statistically significant:  $t(62) = -1.837$ ,  $p = 0.071$ ,  $d = 0.47$ . For persuasion behavior: agent match, the mean difference between the far groups ( $M = 6.62$ ,  $SD = 4.67$ ,  $Mdn = 6$ ) and the near groups ( $M = 8.06$ ,  $SD = 5.98$ ,  $Mdn = 7$ ) was also not statistically significant:  $t(62) = -1.072$ ,  $p = 0.288$ ,  $d = 0.27$ . Finally, for persuasion perception, the mean difference between the far groups ( $M = 5.72$ ,  $SD = 2.14$ ,  $Mdn = 6$ ) and the near groups ( $M = 6.31$ ,  $SD = 2.47$ ,  $Mdn = 7$ ) was not statistically significant:  $t(62) = -1.027$ ,  $p = 0.308$ ,  $d = 0.26$ .

To test whether persuasion behavior (any change; agent match) or persuasion perception were affected solely by presence or lack of online community membership, independent-sample t-tests were conducted comparing both online community groups (OCF and OCN) to both non-online community groups (NCF and NCN). For persuasion behavior: any change, the mean difference between the OC groups ( $M = 11.69$ ,  $SD = 7.71$ ,  $Mdn = 10$ ) and the NC groups ( $M = 13.81$ ,  $SD = 7.23$ ,  $Mdn = 15$ ) was not statistically significant:  $t(62) = -1.138$ ,  $p = 0.26$ ,  $d = 0.29$ . For persuasion behavior: agent match, the mean difference between the OC groups ( $M = 6.31$ ,  $SD = 5.01$ ,  $Mdn = 6$ ) and the NC groups ( $M = 8.38$ ,  $SD = 5.6$ ,  $Mdn = 8$ ) was also not statistically significant:  $t(62) = -1.554$ ,  $p = 0.125$ ,  $d = 0.39$ . Finally, for persuasion perception, the mean difference between the OC groups ( $M = 6.56$ ,  $SD = 1.78$ ,  $Mdn = 6$ ) and the NC groups ( $M = 5.47$ ,  $SD = 2.66$ ,  $Mdn = 6.5$ ) was not statistically significant:  $t(62) = 1.932$ ,  $p = 0.058$ ,  $d = 0.49$ .

### 7.3 Contest Dilemma

Mann-Whitney tests were used to compare the levels of cooperation behavior between groups during Contest Dilemma, as the data does not show a normal distribution. The tests indicated that the mean differences between the OCF group ( $M = 3.94$ ,  $SD = .25$ ,  $Mdn = 4$ ) and OCN group ( $M = 3.88$ ,  $SD = .5$ ,  $Mdn = 4$ ) were not statistically significant:  $U = 127.5$ ,  $n_1 = n_2 = 16$ ,  $p = .96$ ,  $r = .008$ . The test also indicated that the groups not involved in online communities, NCF ( $M = 3.69$ ,  $SD = .6$ ,  $Mdn = 4$ ) and NCN ( $M = 3.56$ ,  $SD = .73$ ,  $Mdn = 4$ ), cooperated similarly:  $U = 118.5$ ,  $n_3 = n_4 = 16$ ,  $p = .65$ ,  $r = .08$ . The mean difference between the OCF group ( $M = 3.94$ ,  $SD = .25$ ,  $Mdn = 4$ ) and the NCF group ( $M = 3.69$ ,  $SD = .6$ ,  $Mdn = 4$ ) was not statistically significant:  $U = 103.5$ ,  $n_1 = n_3 = 16$ ,  $p = .14$ ,  $r = .26$ . Lastly, the mean difference between the OCN group ( $M = 3.88$ ,  $SD = .5$ ,  $Mdn = 4$ ) and the NCN group ( $M = 3.56$ ,  $SD = .73$ ,  $Mdn = 4$ ) was not statistically significant for cooperation behavior:  $U = 97.5$ ,  $n_2 = n_4 = 16$ ,  $p = .09$ ,  $r = .30$ . The total number of defects per group is reported in Figure 7.

**Figure 7**  
**Number of Defects Across Trials by Groups**



Among all participants as a whole, there was a slight positive correlation between cooperative behavior and perception of the task partner as cooperative. However, the correlation does not meet statistical significance: Pearson's  $r(62) = .21$ ,  $p = 0.096$ . Only 20.3% of all participants, when asked how cooperative they thought their task partner was, ranked the task partner anything below a 10 (on a scale from 1-10, 10 being the most cooperative). This acted as a proof-of-concept for the task, meaning that it was clear based on the structure of the task that participants knew their task partner was cooperating with them throughout the four Contest Dilemma trials. Deviation, then, is likely to indicate a result due to online community membership or distance, as reported below.

Mann-Whitney tests were again used to test perceptions of the task partner as cooperative between groups. The mean difference between the OCF group ( $M = 9.25$ ,  $SD = 2.08$ ,  $Mdn = 10$ ) and the OCN group ( $M = 9.94$ ,  $SD = .25$ ,  $Mdn = 10$ ) did not meet statistical significance:  $U = 119$ ,  $n_1 = n_2 = 16$ ,  $p = .5$ ,  $r = .19$ . The mean difference between the NCF group ( $M = 9.62$ ,  $SD = .89$ ,  $Mdn = 10$ ), who were told they were more distant to their task partner, and the NCN group ( $M = 8.75$ ,  $SD = 1.77$ ,  $Mdn = 10$ ) did not meet the statistical significance threshold:  $U = 93$ ,  $n_3 = n_4 = 16$ ,  $p = .11$ ,  $r = .28$ . Likewise, the mean difference between the OCF group ( $M = 9.25$ ,  $SD = 2.08$ ,  $Mdn = 10$ ) and the NCF group ( $M = 9.62$ ,  $SD = .89$ ,  $Mdn = 10$ ) was not statistically significant:  $U = 123$ ,  $n_1 = n_3 = 16$ ,  $p = .77$ ,  $r = .05$ . However, the OCN group ( $M = 9.94$ ,  $SD = .25$ ,  $Mdn = 10$ ) perceived their task partner as more cooperative than did the NCN group ( $M = 8.75$ ,  $SD = 1.77$ ,  $Mdn = 10$ ), and this did meet statistical significance:  $U = 77$ ,  $n_2 = n_4 = 16$ ,  $p = .011$ ,  $r = .45$ .

To test whether cooperation behavior or cooperation perception were affected solely by distance, Mann-Whitney tests were conducted comparing both far groups

(OCF and NCF) to both near groups (OCN and NCN). For cooperation behavior, the mean difference between the far groups ( $M = 3.81$ ,  $SD = .47$ ,  $Mdn = 4$ ) and the near groups ( $M = 3.72$ ,  $SD = .63$ ,  $Mdn = 4$ ) was not statistically significant:  $U = 491.5$ ,  $n_{1\&3} = n_{2\&4} = 32$ ,  $p = .68$ ,  $r = .05$ . For cooperation perception, the mean difference between the far groups ( $M = 9.44$ ,  $SD = 1.58$ ,  $Mdn = 10$ ) and the near groups ( $M = 9.34$ ,  $SD = 1.38$ ,  $Mdn = 10$ ) was not statistically significant:  $U = 469$ ,  $n_{1\&3} = n_{2\&4} = 32$ ,  $p = .41$ ,  $r = .1$ . To test whether cooperation behavior or cooperation perception were affected solely by presence or lack of online community membership, Mann-Whitney tests were conducted comparing both online community groups (OCF and OCN) to both non-online community groups (NCF and NCN). For cooperation behavior, the OC groups ( $M = 3.9$ ,  $SD = .39$ ,  $Mdn = 4$ ) cooperated much more often than the NC groups ( $M = 3.63$ ,  $SD = .66$ ,  $Mdn = 4$ ), and this did meet statistical significance:  $U = 401.5$ ,  $n_{1\&2} = n_{3\&4} = 32$ ,  $p = .024$ ,  $r = .28$ . For cooperation perception, the OC groups ( $M = 9.6$ ,  $SD = 1.49$ ,  $Mdn = 10$ ) perceived their task partner as somewhat more cooperative than did the NC groups ( $M = 9.2$ ,  $SD = 1.45$ ,  $Mdn = 10$ ), and this did meet statistical significance:  $U = 405$ ,  $n_{1\&2} = n_{3\&4} = 32$ ,  $p = .041$ ,  $r = .26$ .

#### 7.4 Distance Perception

Participants were asked to rate their distance from their task partner on a scale from 1 - 10. A one-way ANOVA was conducted to determine whether participants perceived their task partner's distance differently based on either distance or online community membership. This test compared all four groups to each other: OCF ( $M = 6.13$ ,  $SD = 2.42$ ,  $Mdn = 7$ ), OCN ( $M = 6.94$ ,  $SD = 2.17$ ,  $Mdn = 7$ ), NCF ( $M = 6.31$ ,  $SD = 2.41$ ,  $Mdn = 6$ ), and NCN ( $M = 5.38$ ,  $SD = 2.58$ ,  $Mdn = 5$ ), but this did not meet statistical significance:  $F(3, 60) = 1.15$ ,  $p = 0.337$ .

There was a weak positive correlation between distance perception and persuasion perception, but this did not meet statistical significance: Pearson's  $r(62) = .21$ ,  $p = 0.095$ . There was a similarly weak positive correlation between distance perception and cooperation perception, but this also did not meet statistical significance: Pearson's  $r(62) = .22$ ,  $p = 0.081$ . There was a weak negative correlation between distance perception and persuasion behavior: any change, but this did not meet statistical significance: Pearson's  $r(62) = -.19$ ,  $p = 0.131$ . There was a stronger negative correlation between distance perception and persuasion behavior: agent match, but this did not meet statistical significance: Pearson's  $r(62) = -.23$ ,  $p = 0.067$ . Lastly, there was an extremely weak negative correlation between distance perception and cooperation behavior, and this was not statistically significant: Pearson's  $r(62) = -.05$ ,  $p = 0.697$ .

To test whether distance perception was affected solely by distance, an independent-samples t-test was conducted comparing both far groups (OCF and NCF) to both near groups (OCN and NCN). The mean difference between the far groups ( $M = 6.22$ ,  $SD = 2.38$ ,  $Mdn = 7$ ) and the near groups ( $M = 6.16$ ,  $SD = 2.48$ ,  $Mdn = 7$ ) was not statistically significant:  $t(62) = 0.103$ ,  $p = 0.918$ ,  $d = 0.03$ . To test whether distance perception was affected solely by presence or lack of online community membership, an independent-samples t-test was conducted comparing both online community groups (OCF and OCN) to both non-online community groups (NCF and NCN). Here again, the mean difference between the OC groups ( $M = 6.53$ ,  $SD = 2.3$ ,  $Mdn = 7$ ) and the NC groups ( $M = 5.84$ ,  $SD = 2.5$ ,  $Mdn = 6$ ) was not statistically significant:  $t(62) = 1.144$ ,  $p = 0.257$ ,  $d = 0.29$ .

## 8 Group Analysis

In order to look at the results more closely, this section focuses on each group as an individual unit. Discussion of the hypotheses follows in section 9.1.

### 8.1 OCF

The OCF group, which again was made up of individuals who did consider themselves members of online communities, was told their task partner was located approximately 5000 miles away from them. For some participants, this was a very far distance and for others, 5000 miles may have felt insignificant (range: 1-9). The modes for distance perception in the OCF group were 5 and 7, both of which were submitted as a response four times each. For this group, there was an above average positive correlation between persuasion behavior: any change and persuasion behavior, which did meet statistical significance: agent match: Pearson's  $r(14) = .9, p < 0.001$ . This means that, for the most part, when this group rearranged their item ranking, they did so in order to make their item ranking more similar to their task partner's. Only two participants failed to make any changes to their item rankings, and an additional third participant changed their item ranking but their new ranking was equally dissimilar from their task partner's as their original ranking.

The OCF group was highly likely to both cooperate with their task partner (total of one defect) and to perceive their task partner as cooperative in turn. Only two participants ranked their task partner as anything other than a 10 when asked how cooperative their task partner was (in those cases, the responses were 3 and 5). These same two participants attempted to make non-cooperation agreements with their partner, wherein they tried to convince their task partner to alternate back and forth between cooperating and defecting. One of these participants attempted to lie about past actions, informing their task partner that they had defected on a previous round when they had, in fact, cooperated. The other lied about future behavior, promising to cooperate during one round when they went on to defect. Four of the participants either explicitly or implicitly referenced trust. One mentioned trust while attempting to make a non-cooperation agreement and another specifically thanked their task partner for being trustworthy. Two participants explained that they would base their behavior off of their task partner's decisions and continue to cooperate as long as their partner did, suggesting fragile trust. Two participants mentioned that the raffle entry incentive was not enough to cause them to defect.

### 8.2 OCN

The OCN group was made up of individuals who did consider themselves members of online communities and were told their task partner was located approximately 50 miles away from them. The range of distance perception responses was 3-10. The mode for distance perception in the OCN group was 8, which was submitted as a response four times. For this group, there was an above average positive correlation between persuasion behavior: any change and persuasion behavior, which did meet statistical significance: agent match: Pearson's  $r(14) = .89, p < 0.001$ . This means that, for the most part, when this group rearranged their item ranking, they did so in order to make their item ranking more similar to their task partner's. Only one participant failed to make any changes to their item rankings, and

an additional two participants changed their item ranking but their new ranking was equally dissimilar from their task partner's as their original ranking.

The OCN group was highly likely to both cooperate with their task partner (total of two defects) and to perceive their task partner as cooperative in turn. Only one participant ranked their task partner as anything other than a 10 when asked how cooperative their task partner was (in that case, the response was 9). No one in this group attempted to make any non-cooperation agreements with their task partner, and no one lied outright about previous or future behavior. However, one participant implied future cooperation during Round 2 but went on to defect. One participant mentioned that their task partner seemed trustworthy after Round 1, and said they would have been tempted to defect only if they did not trust their task partner. Finally, two participants used humor as a strategy during this task and one mentioned that they felt discussion was important.

### 8.3 NCF

The NCF group was made up of individuals who did not consider themselves members of an online community. They were told their task partner was located approximately 5000 miles away from them. The range of distance perception responses was quite broad (range: 1-10). The mode for distance perception in the NCF group was 8, which was submitted as a response three times. For this group, there was an above average positive correlation between persuasion behavior: any change and persuasion behavior, which did meet statistical significance: agent match: Pearson's  $r(14) = .891, p < 0.001$ . This means that, for the most part, when this group rearranged their item ranking, they did so in order to make their item ranking more similar to their task partner's. Only two participants failed to make any changes to their item rankings.

The NCF group was moderately likely to both cooperate with their task partner (total of five defects) and to perceive their task partner as cooperative in turn. Only three participants ranked their task partner as anything other than a 10 when asked how cooperative their task partner was (in those cases, the responses were 7, 8, and 9). One of those three participants, as well as two others, tried to make non-cooperation agreements with their task partner. Four participants lied about past or future behavior. One participant explained a Round 1 defection by saying they had not trusted their task partner at first but, based on the task partner's behavior, would begin cooperating. They later mentioned a hesitancy to keep trusting, suggesting both a delayed and fragile trust. Another participant explicitly asked their partner to trust them and explained that continued trust was extremely important. Finally, one participant expressed a desire to discuss their decisions after agreeing to cooperate and another mentioned that the stakes were too low to cause them to defect.

### 8.4 NCN

The NCN group was made up of individuals who did not consider themselves members of an online community. They were told their task partner was located approximately 50 miles away from them. The range of distance perception responses was 1-9. The modes for distance perception in the NCN group were 5, 7, and 8, each of which were submitted as a response three times. For this group, there was a below average positive correlation between persuasion behavior: any change and persuasion behavior, which did meet statistical significance: agent match: Pearson's  $r(14) = .819, p < 0.001$ . This means that this group was more likely to change their item ranking



without necessarily matching their new item ranking to their task partner's. However, all participants in this group changed their item rankings to some extent.

The NCN group was moderately likely to cooperate with their task partner (total of seven defects) and only fairly likely to perceive their task partner as cooperative in turn. Seven participants ranked their task partner as something other than 10 when asked how cooperative their task partner was (in those cases, the range was 5-9). Two participants attempted to make a deal, although only one of those deals was a non-cooperation agreement. Two participants lied about future behavior. One participant displayed delayed trust while another expressed fragile trust and mentioned that discussion would change if one of them began defecting. Two participants used humor as a strategy, although one of them used humor to soften their defection. For one participant in this group, there was a loss of discussion data.

## 9 Discussion

### 9.1 Discussion of Hypotheses

The majority of the analysis performed throughout section 7 shows that the results are not statistically significant. Thus, the data, for the most part, does not support rejection of the null hypothesis ( $H_0$ ). The most likely cause for the lack of statistical significance is the small sample size in each group. It is also possible that distance and/or online community membership does not interact with behavior or perception in these tests, or that the interactions are so small that they cannot be detected with a sample of this size.

$H_0$ : The null hypothesis is that neither distance nor online community membership affects, at a level of statistical significance, the following scores: persuasion behavior: any change, persuasion behavior: agent match, cooperation behavior, persuasion perception, cooperation perception, or distance perception.

$H_1$ : The hypothesis was that the far groups would be less persuaded and would cooperate less than would the near groups. The differences in the means between the far and near groups for persuasion behavior: any change, persuasion behavior: agent match, or cooperation behavior were not statistically significant, thus there is no support for rejecting  $H_0$  in favor of  $H_1$ .

$H_2$ : The hypothesis was that the far groups would perceive their task partner as less persuasive, less cooperative, and more distant than would the near groups. The differences in the means between the far and near groups for persuasion perception, cooperation perception, and distance perception were not statistically significant, thus there is no support for rejecting  $H_0$  in favor of  $H_2$ .

$H_3$ : The hypothesis was that the OC groups would be less persuaded and would cooperate less than would the NC groups. The differences in the means between the OC and NC groups for persuasion behavior: any change and persuasion behavior: agent match were not statistically significant. However, the difference in the means between the OC and NC groups for cooperation behavior was statistically significant. Overall, there is not support for rejecting  $H_0$ , but this includes a caveat that  $H_3$  was accurate for cooperation behavior.

H<sub>4</sub>: The hypothesis was that the OC groups would perceive their task partner as more persuasive, more cooperative, and less distant than would the near groups. The differences in the means between the OC and NC groups for persuasion perception or distance perception were not statistically significant. However, the differences in the means between the OC and NC groups (both OCN compared to NCN and both OC groups compared to both NC groups) for cooperation perception were statistically significant. Overall, there is not support for rejecting H<sub>0</sub>, but this includes a caveat that H<sub>4</sub> was accurate for cooperation perception.

H<sub>5</sub>: The hypothesis was that the difference between the means for the OCF group and the OCN group will be smaller than the difference between the means for the NCF group and the NCN group for all scores. The differences in the means between the OC groups and the differences in the means between the NC groups were not statistically significant for the following scores: persuasion behavior: any change, persuasion behavior: agent match, persuasion perception, cooperation behavior, cooperation perception, and distance perception, thus there is no support for rejecting H<sub>0</sub> in favor of H<sub>5</sub>.

## 9.2 Trends

Because most of the results do not support the rejection of the null hypothesis, the following discussion of trends does not imply the veracity of H<sub>1</sub> - H<sub>5</sub>. This section will instead focus on whether any patterns emerged in the data that could suggest a need for future research, and the caveats present in H<sub>3</sub> and H<sub>4</sub>. This section will also focus on possible theoretical explanations for any emerging patterns.

### 9.2.1 Persuasion and Island Survival & Rescue

Although this research does not compare different types of CMC conditions or CMC to NCMC, it is clear that it was at least possible for participants to be persuaded to change their minds via text-based communication. The Island Survival & Rescue task gave participants the opportunity to deal with ambiguous information in an environment with low emotional stakes. This may mean that participants felt low motivation to change their minds, but the data does not reflect that, considering that only 10.9% of participants did not change their item rankings to more closely match their task partner. Perhaps participants actually felt a high motivation to change their minds, as there was little to no risk in doing so. Survey responders ranked each item in each position at least once, which indicates that there was high variability in the ways responders approached the scenario, and in fact, several participants commented on the fact that they felt they were not given enough information while completing the survey. This might have increased participants' ability to change their minds. However, it is a stretch to argue that the information discussed during the task was difficult to process, which stands in contrast to Kruglanski and Thompson's (1999) suggestion that it should have been in order to be persuasive if motivation and ability to be persuaded was high.

It is difficult to say exactly why participants changed their minds during this task, but quite often participants made comments expressing that they felt their task partner had made a sound logical argument for or against an item. For the most part, these statements referred to the introduction of information that the participant had not thought of, usually regarding a new or creative use for an item. Because the task

partner could not give responsive input beyond "Yup!", "Hm", "Haha", etc., the task partner could not actively argue against a participant's statements about any item. Participants did, on the other hand, actively agree with or argue against the task partner's statements, suggesting that they were inclined to process the information logically. There were no attempts by participants to use emotion, reward, or punishment (Wilson, 2002, p. 1986) to change their task partner's mind. Central-processing (Guadagno & Cialdini, 2007) or "deep" reasoning (Lavine, 1999), seems evident throughout.

Although the tests found that the mean differences for persuasion behavior: any change and persuasion behavior: agent match were statistically insignificant, there are some interesting patterns that appear to have emerged. These patterns suggest that there may have been some context-based peripheral processing (Guadagno & Cialdini, 2007) after all. For persuasion behavior: agent match, the scores are identical for the far groups and the NCF group, and somewhat higher for the NCN group. Thus, the NCN group was more persuaded to change their item ranking to be nearer to their task partner's. Again, as the data does not meet statistical significance, this does not necessarily support earlier predictions made based on Social Impact Theory or online community membership. However, because the scores for the other three groups match so neatly, it does suggest that there could be an interaction at play for the NCN group. But why, then, would distance only affect persuasion for the participants not involved in online communities?

Perhaps for the NC groups, distance represented knowledge. It is possible that NCF participants, as opposed to NCN participants, felt that the larger distance meant a less relevant pool of information. If participants believed their task partner had less relevant knowledge than they did, then perhaps participants also believed that their task partner had less expertise than they did when it came to finding ways to make use of the task items. Actor-Network-Theory (Munro, 2009) may be the key here. Distance does seem to have been an actant here, and its role was to influence how participants responded to the same set of persuasive information. Potentially, the same information went from being an odd or poor interpretation of the task (from the perspective of a distant participant) to an insightful analysis (in the eyes of a nearby participant). This may represent a change "in knowledge and action, ie. learning," (Fox, 2000, p. 860). Simultaneously, OC participants were not affected by the distance in the same way because they may have felt that being a member of an online community expands their set of knowledge to include knowledge gained in other parts of the world. Thus, they believed their original analysis included the knowledge their task partner applied to Island Survival & Rescue, regardless of distance.

Interestingly, there was a stronger (and statistically significant) correlation between persuasion behavior: any change and persuasion perception than persuasion behavior: agent match and persuasion perception. This indicates that participants were not entirely aware of how well they were persuaded by their task partner. Of course this does not answer the question of central versus peripheral processing, but it does suggest that perceptions might have been more related to peripheral clues like distance. As noted, the mean difference in persuasion perception was not statistically significant. The data, however, does indicate another pattern, as the far participants considered their task partner to be less persuasive than the near participants in both conditions.

### 9.2.2 Cooperation and Contest Dilemma

As noted in section 7.3, none of the Mann-Whitney tests demonstrated any statistical significance between the four groups' mean differences. The OCF group and OCN group cooperated at a very similar rate, although the slight difference was in the OCF group's favor, and both groups cooperated more than did both of the NC groups. The gap in cooperation perception, then, is perhaps more interesting. Even though the OCF group cooperated slightly more than did the OCN group, they perceived their task partner as less cooperative. In contrast, for the NC groups, cooperation perception matched cooperation behavior. This recalls early immediacy research that suggests that distance might actually affect perception and not behavior (Mullen, 1985). This may have to do with the order of events in the experiment. When engaging in Contest Dilemma, participants had not just been primed to consider distance. However, when asked how cooperative participants considered their task partner to be, they had just been asked how distant they felt from their partner. But if this is the explanation for the mean differences between cooperation behavior and cooperation perception, why did perception skew in two different directions?

One explanation relates to the lack of statistical significance in comparing the means between the OCF and OCN groups. While it is possible that the sample sizes were too small, it is also possible that distance truly does not play a role in whether the participants engaged in cooperative behavior. If that is the case, then it stands to reason that the difference between the rates of cooperation for the OCF and OCN groups and for the NCF and NCN groups were a result of chance. If this is true, then we could expect the rates to become closer with a larger sample size. If, as Mullen (1985) posited, distance matters more for perception than behavior, this result makes sense. Another explanation is that the NCN group, who defected more than any other group, developed their perceptions of their task partner according to Social Identity Theory (Turner, Brown, & Tajfel, 1979). Perhaps the NC participants were unused to an expectation of personal similarity or homophily (Brown, Broderick, & Lee, 2007) over distance and so assumed that the closer their task partner was, the more similar their behavior would be. Thus, if the participant was tempted to defect, their task partner must have been as well.

Levels of trust were certainly a factor across the four trials of Contest Dilemma. Delayed trust and fragile trust were evident based on statements made during the trials, as is noted in other research on text-based communication (Bos et al., 2002; Bradner & Mark, 2002). Overall, defections were more common in the first two trials, suggesting delayed trust on the whole. Furthermore, participants in all four groups expressed a desire to cooperate as long as their partner cooperated. Because the task partner cooperated during every trial, most participants clearly felt no need to change their own behavior based on their task partner's. Had the task partner behaved differently, it seems clear that participants, perhaps regardless of online community membership or distance, would have deindividuated (Bos et al., 2002) their task partner and thus defected more often.

Interestingly, participants in the NC groups defected more than did participants in the OC groups. This could be explained by their avowed lack of connection to individuals over the Internet who they have never met face-to-face. For them, it may not have mattered how close their task partner was, as their task partner was still a deindividuated stranger. The setting in which the tasks took place was more likely to be unfamiliar to the NC groups, who were not used to acting cooperatively

with Internet strangers. Thus, there was no opportunity for a carryover effect (Orbell, van de Kragt, & Dawes, 1988).

As noted, the carryover effect is an aspect of the communication effect (Bicchieri & Lev-On, 2007), which may have had another impact on the results. Bicchieri and Lev-On note that part of what makes cooperation possible in NCMC conditions is identification. If this can be extended to CMC conditions, then it could be that some participants felt the need to establish a relationship with their task partner in order to increase affiliation or social identification and used humor to do so. That said, this only seemed to happen in the near groups. It could also be that for people in the far groups, using humor felt more risky. For example, they may have thought that a distant task partner was less likely to share their sense of humor, and for that reason may have avoided using humor to simultaneously avoid alienating their partner. The other two aspects that Bicchieri and Lev-On note of NCMC cooperation are discussion and commitment. In order for discussion to matter, however, it must be about the social dilemma (in this case, Contest Dilemma), so that commitments are possible. For this research, participants were instructed to talk about the tasks only, and this may have had an overall effect on the results, as defections were quite low. Section 9.4 will discuss the potential implications of tweaking experimental setups for cooperation research in a CMC setting.

### **9.2.3 Influence of Online Community Membership**

Avowal or the lack thereof of online community membership does seem to have an effect on cooperation behavior and perception. When all of the participants in the OC groups were compared to all of the participants in the NC groups, there was a statistically significant difference in how likely the participants were to cooperate during Contest Dilemma. This group also perceived their partner as more cooperative, which may be a result of the lower tendency to defect in the OC groups. Further, although it did not reach statistical significance, both OC groups do seem to have considered their task partner more persuasive than both NC groups. As discussed earlier, there may be an assumption of similarity here as per the processes supposed by Social Identity Theory (Turner, Brown, & Tajfel, 1979).

Although there was a gap of time between survey response and task participation (ranging from one day to several weeks), the OC group may have been primed by having answered "Yes" to being a member of an online community (Wilson & Peterson, 2002). They may have expected that their task partner had also avowed membership, and so they expected similar behavior of their task partner. Participants in these groups may also have felt a stigmatic pressure to, as representatives of their online community, display social norms that are generally considered lacking in CMC (Johnson, 2001). Behavior might be demonstrative of 'politeness syndrome' (Borthick & Jones, 2000), although the OC groups lied less often than did the NC groups. If the OC groups felt primed to consider their online community membership, they might also have applied their previous knowledge to the task. Their general level of CMC cooperation, when dealing with their online communities, might have influenced their task behavior, which invokes the carryover effect (Bicchieri & Lev-On, 2007) as an explanation. Perhaps they have found that accomplishing tasks via CMC generally requires a high level of cooperation, and so they behaved more cooperatively via CMC than they might in other situations.

The NC groups displayed somewhat more dishonesty than the OC groups and cooperated less overall. It is possible that they, not being representatives of any group,

behaved according to their pre-conceived ideas about CMC and computer-mediated interaction. For them, there may still be a distinct line between NCMC interactions and virtual interactions (Benwell & Stokoe, 2006). For them, Contest Dilemma may have had less to do with cooperation and more to do with gameplay, in which case, their goal might have been to win, not to help someone else win. Still, the vast majority of people in these groups cooperated on every trial. It seems clear that overall, both the participants in the NC groups and the participants in the OC groups believed that their task partner was a real person who could have benefited from cooperation, implying that the carryover effect (Biccheri & Lev-On, 2007) may have been an active force, at least to some extent, even for the NC group.

#### **9.2.4 Did Distance Matter?**

The impetus for this research was the idea, as proposed by Social Impact Theory, that distance, as a component of immediacy, might influence behavior over CMC. Unfortunately, because none of the results isolating distance are statistically significant, there is very little to be said about whether SIT can ultimately be used as a framework for understanding computer-mediated interaction now that online communities are so ubiquitous. Furthermore, the trends apparent in the results are rather odd. The far groups combined were less persuaded to change their item rankings at all, were less persuaded to match their item ranking to their task partner's, and perceived their task partner as less persuasive. Alternatively, the far groups were slightly more likely to cooperate with their task partner and slightly more likely to find their task partner persuasive. The small sample size seems to be likeliest cause of these results.

It is also possible that distance just may not be that large of a factor, or that it is mitigated by other more important factors like online community engagement. This could be related to other components of SIT, like status, which harkens back to Mullen's (1985) critique of SIT research. Even though attempts were made to separate out distance from other aspects of SIT, it may be that distance is simply too tricky of a concept to be investigated in isolation, particularly because distance is posited to be a part of immediacy. Perhaps other factors in immediacy play a role in ways that are difficult to tease out from this research. Ultimately, distance itself seemed to interact with behavior and perception, but not in a consistent manner or necessarily in accordance with earlier hypotheses.

#### **9.2.5 Post-Task Distance Perception**

Again, as the mean differences for distance perception did not meet statistical significance, no claims about what this means for SIT can be made. That said, it is still worthwhile to discuss the results of the distance perception question. These results may be the most strange and difficult to interpret, and the likeliest reason for that is the statistical insignificance. Are there any other reasons that the NCN group perceived their task partner as farther away than any other group, including the NCF group? One possible other interpretation is that, because this group defected more than any other group, they felt a larger emotional distance from their partner. Although statistically insignificant, the weak but positive correlation between distance perception and cooperation perception might lend credence to this interpretation. For this group, the medium may not have lent itself to a strong para-social presence (Kumar & Benbasat, 2002), supporting Siegel's (1986) supposition of increased anti-

social or harmful behavior via CMC. It remains unclear exactly why this group seems to have experienced a lower PSP, however.

This could be a result of the method used to manipulate distance, although it would still be unclear why one group would react to the manipulation differently than would the other groups. It is possible that participants did not always notice or think much about the statements regarding their task partner's distance from them. This does not seem to be the most likely cause, as the method used to manipulate distance in this research is consistent with previous research (Moon, 1999) which does, in fact, indicate that participants notice brief distance statements. When asked about distance perception, some participants explained that while they knew what the task partner's distance was and believed it to be the partner's true distance, they did not have the sense that their partner was as far or as near as the stated distance. This suggests that distance was manipulated on a level that was perceptible to participants, but that the manipulation ultimately did not matter. It is also possible that some participants were not certain they were chatting with a real person, though again, this should have affected the participants equally across groups. Consideration was given to possible ways of checking, post-task, what the participants believed about their task partner (eg. human or bot, actual distance), but asking these questions might have implied certain things about the task partner that would have skewed the answers.

### **9.3 Implications**

Because the results are, on the whole, inconclusive, this research does not imply that Social Impact Theory necessarily should be adjusted or reconsidered. However, there are indications that future distance researchers may want to strongly consider whether distance perception is as vital to persuasive or cooperative communication as it has been posited to be in the past. Distance as a factor of immediacy, along with immediacy as one of the three components of SIT, does seem to have been the least supported by the evidence ever since SIT's inception. This, however, seems mostly due to the lack of research regarding distance and not particularly due to ambiguous results.

SIT researchers, as well as CMC researchers, should also pay attention to ideas about online communities. Much more so than distance, avowal as a member of an online community appears to have interacted with both perception and behavior, especially in light of the cooperation task. Because the scenario was low-stakes, it is especially important not to assume that the results should extend to non-laboratory conditions. That said, it is also important to note that a large amount of cooperation that takes place via CMC outside of the laboratory will also be low-stakes and it is thus critical to, at the very least, develop a good understanding of this level of cooperation via CMC. Although ideas about online communities are still developing and there is no standard view of behavioral characteristics regarding these virtual spaces, it is vital that researchers do not assume that these groups are lawless versions of NCMC communities. This research, at least, provides evidence that online communities might display high levels of cooperation.

For that reason, and with the carryover effect (Bicchieri & Lev-On, 2007) in mind, it is also important to consider the practical implications of this research. The idea that being involved in an online community increases the levels of cooperation put forth by communicators via CMC is, perhaps, most relevant for workplaces dealing with or considering remote work. It would almost certainly not be advisable for employers to force socialization upon employees in the hopes that cooperative

behavior will increase. However, it may be advisable for employees to, at the very least, create spaces where informal CMC interaction is likely to occur. Beyond remote work, this may even be useful for traditionally located workplaces.

Creating space for interaction is not a new concept, but based on the survey responses received in this research, proper virtual replication of the 'water cooler' may be lacking in remote workplaces. The majority of responders said that they primarily interacted with their online communities on Facebook. Although many responders answered 'Other' when asked on which platform they primarily interact with their communities, the majority of these answers were places they sought out to develop a particular interest. Employers are unlikely to see this behavior matched for workplace communication. Instead, employers ought to consider bringing the virtual space to their employees, so that employees are not required to manage multiple platforms. If the space for interaction exists where employees already are, then employers may find that their remote workers are more likely to develop cooperative relationships. Facebook groups might therefore be a useful option for employers, with the expectation that employees can opt out of participation and suffer no workplace ramifications beyond, perhaps, the social.

The use of Facebook for the workplace, or perhaps another existing social media space, has other consequences for developing colleague communication. Social media sites already support a multitude of ways to interact. Because high symbol variety (Dennis & Valacich, 1999) is already supported by these platforms, and because the culture of engaging with various symbols is already commonplace on these platforms, remote workers are perhaps more likely to find a style of interaction that matches or represents their NCMC interactions. For example, there is nothing strange about communicating non-verbally through 'liking' a post on Facebook or commenting with a simple ':)', whereas these actions may not be possible through workplace intranets or may feel out-of-place. CMC researchers Meishar-Tal, Kurtz, and Pieterse (2012), through researching Facebook as a tool for learning, point out that a space may feel different for a user if owned and controlled by a user's institution. Users in these spaces may be less likely to behave casually.

The final implication of this research may be most important to consider for members or moderators of online community. To note again, Latané (1996) reworked SIT into a larger concept, referred to as dynamic SIT because he found that the processes that originally work to develop communities was repetitive. That may mean that as online communities develop, they become more insular, and, as supported by this research if the carryover effect stands, more cooperative and more persuasive within the group. This may or may not be considered a good thing within the group. For some groups, this may discourage new members from joining or stifle the introduction and development of new ideas. As with other aspects of online community, each individual community may need to decide for themselves to what degree insularity suits them or accomplishes their goals. Moderators or leaders may need to then negotiate new rules or standards of behavior.

#### **9.4 Future Research**

The mostly inconclusive data suggests several other methods for future research regarding Social Impact Theory. First, replications of this study with greater numbers of participants in each group would certainly provide some interesting insights on whether persuasion or cooperation behavior and perception actually does interact with the experimental conditions. Such research would likely benefit from



taking place in one location, being set up through NCMC methods, and presenting participants with task partners separated by different distances as opposed to located in different cities. Similarly focused research could also be conducted making use of different methods of communication, including text chat, voice chat, video chat, email, and NCMC conditions. Similar research focusing on persuasion or cooperation could also make use of other task-based exercises, or could redesign the ones used in this experiment. For example, researchers could test how cooperative participants are in different distance, CMC, or identity-based conditions for infinite horizon prisoner's dilemma games versus finite horizon games. Researchers could also experiment with tweaking the level of discussion encouraged during cooperation tasks, or could consider other methods of manipulating distance.

Future research could also focus on other aspects of SIT, particularly strength, as they intersect with online communities. Much of the research that has been conducted previously regarding strength has investigated this component of SIT as it relates to social media use but has not focused on identity as a member of an online community. This may be difficult, as what it means to be a part of an online community can be a nebulous idea. For that reason, it is also recommended that future research in this vein take stock of what it means to be a member of an online community through case studies. Case studies of online communities would be particularly useful in developing better understandings of community purpose and structure, identities across multiple platforms, and community fluidity. Another benefit of a case study is the potential for higher stakes cooperation tasks. Interviews as part of a case study could also be quite useful here. Finally, similar case studies of remote work groups might also be insightful, perhaps by comparing groups that interact primarily on social media platforms to those that interact primarily through an institutional platform.

## 10 Conclusion

Whatever else can be said of Latané's Social Impact Theory, it certainly does prompt pondering what goes into what we believe about the world. Can these things really be boiled down into equations, numbers, and distances? This research was developed to address these ideas as they may or may not apply to online communities. The suppositions behind Social Impact Theory regarding distance seemed counterintuitive in light of the support and friendship communicators who have never and will never be co-located offer each other over social media and other platforms. For the most part, the hypotheses put forth by this research were not supported, which was that there was no difference between participants at a distance and nearby participants when investigating cooperative and persuasive behavior and perception. Of course, this does not mean that distance played no role. However, the results do show that self-identification as a member of an online community might have been a more important factor. Both cooperation behavior and perception and persuasion perception appear to have been influenced by this condition, and so it is important to consider what this could mean for ideas about online community.

For online communities, it may be that distance is merely incidental. It is still true that distance will stop communicators from being able to offer all of the benefits of NCMC communities. No amount of communications research that focuses on behavior or perceptions can make it possible for virtual communities to send over that pre-cooked homemade lasagna made by a friend when a community member is in

need. That said, this research indicates that the desire to make these spaces as supportive as is physically possible exists already. Although persuasion and cooperation are limited processes and do not necessarily extend to other behaviors, it seems clear that any assumptions that begin from an expectation that virtual spaces generally cannot or do not support collaborative social norms are incorrect.

In this way, perhaps, Wilson and Peterson (2002) are correct in their warning for researchers to not exaggerate expectations about Internet interactions. The same norms that developed NCMC communities have guided the creation of online communities. It should be no surprise that these virtual groups display similar behaviors as NCMC groups. However, because of communication technologies, participants in these online communities are more likely to find each other when needed. To again reference Rheingold (2000), these online spaces increase the chance that we might find a friend by "orders of magnitude," (p. 11). Thus, perhaps online communities meet a need for people who are unable to find companionship that suits them in their non-virtual spaces. These communicators have already addressed the fact that distance has separated them from their network of support, and so the implication that distance should affect their interaction further may seem, to them, ridiculous. That said, intuition is not always accurate, and so it is worthwhile to test whether our beliefs about online interactions hold up to scrutiny.

Although this research is not conclusive, it seems reasonable to say that Social Impact Theory's claim about distance may need to be investigated further and potentially reworked to include a more modern understanding of virtual interaction. Distance does not seem to restrict the ability for members of online communities to interact in supportive ways, it only limits their possibilities. The same is true for any community, even those whose interactions are more likely to be co-located. Perhaps then, when the communication technologies catch up to our imaginations, on those days when we feel overworked, anxious, and unable to take care of our own daily needs, those of us who consider ourselves members of online communities might find that a home-cooked lasagna has materialized in our kitchen, sent by our friend who lives on the other side of the world.

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## Appendix

Survey questions:

1. What country do you live in?
2. What is your zip/postal code?
3. Do you consider yourself a member of an online community? (By online community, I'm referring to a group that primarily or exclusively interacts online.)

Yes

No

Other:

4. Where do you interact with your community/ies most often?

Facebook

Instagram

Snapchat

Tumblr

Twitch

Twitter

YouTube

I do not consider myself a member of an online community.

Other:

5. On what platforms do you interact with community members in any capacity? You may select more than one option.

Facebook

Instagram

Snapchat

Tumblr

Twitch

Twitter

YouTube

I do not consider myself a member of an online community.

Other:

6. When you interact with members of your online community, how do you usually communicate? You may select more than one option.

Commenting

Email

Liking/Favoriting

Sharing/Retweeting

Text chat

Video chat

Voice chat

I primarily lurk.

I do not consider myself a member of an online community.

7. When you interact with members of your online community, how do you usually communicate? You may select more than one option.

Daily, more than an hour

Daily, less than an hour

Almost daily

Weekly

Monthly

Yearly

I do not consider myself a member of an online community.

Other

8. Scenario:

Please read the scenario below and complete the ranking exercise that follows.

It is 5:07 PM on November 15th. You have been traveling by air but your plane has crash landed on a tropical island. Everyone on the plane, which includes just you, one other passenger, and the pilot, has survived, but the pilot is unconscious. You and the other passenger have recovered several items from the debris.

The items you and the other passenger have recovered are:

3 airplane blankets

1 book of matches

1 canteen of water (1 quart/.95 L)

1 flashlight (with batteries)

1 life raft (holds 4 people)

1 sectional air map

1 single blade pocket knife

1 standard first aid kit

Please rank the items listed above in order of importance to survival and rescue.

Please rank each item (or set of items) at a different number, ie. only one item should be ranked #1, only one item at #2, and so on.