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The Effect of Face-to-Face versus Computer-Mediated Communication on Interpersonal Outcomes in Getting-Acquainted Situations

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Abstract

People use technology more today than ever before to self-disclose and form new relationships with others. Successful relationship development is often marked by the presence of positive interpersonal outcomes (i.e., closeness and liking). However, there is contention regarding whether computer-mediated communication (CMC) is as effective at developing positive interpersonal outcomes compared to face-to-face (FtF) communication. CMC is often considered subpar due to the lack of nonverbal cues that can be expressed. Two studies were designed to 1) compare the effect of FtF and CMC platform self-disclosures on closeness and liking in zero-acquaintance situations and 2) explore mediators that might explain why FtF and CMC produce closeness and liking. Both studies compared FtF, instant-messaging with a photo, and text-messaging. These conditions represent a continuum of nonverbal cues able to be expressed, with FtF allowing the most and text-messaging allowing the least. Participants in Study 1 self-disclosed via a getting-acquainted exercise, whereas participants in Study 2 had two free-form conversations. Self-disclosures in the FtF condition produced the greatest closeness compared to the CMC conditions. However, after the second conversation in Study 2, there were no differences in interpersonal outcomes across platform type. Potential mediators (i.e., responsive, similarity, ease of processing, and enjoyment of the interaction) were also examined to explain why increases in self-disclosure lead to closeness and liking. Limitations are discussed.

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"The great myth of our times is that technology is communication." –Libby Larsen

Today, developing relationships has never been easier. Historically, people have relied on meeting face-to-face and letter writing to start and maintain relationships. In the past few decades, society has experienced a technology boom, yielding a variety of new avenues (e.g., texting, e-mailing, social network sites) by which people can start and maintain relationships with others (Bargh, McKenna, & Fitzsimons, 2002; Luo & Tuney, 2015; McKenna, Green, & Gleason, 2002; Parks & Floyd, 1996; Ward & Tracey, 2004). Using technology to communicate is by no means a new societal development (e.g., Kiesler, Siegel, & McGuire, 1984). But thanks to recent technological developments, communication is faster, more convenient, and easier than ever. We can even communicate with multiple people simultaneously. People are taking advantage of these benefits and are utilizing technology to begin both friendships and romantic relationships (Rosenfeld & Thomas, 2012).

However, there is concern that using technology could be detrimental to relationship development (e.g., Hertlein & Webster, 2008). Technology platforms, such as computers and cell phones, may not be able to adequately develop positive interpersonal outcomes (i.e., closeness, liking; Kiesler & Sproull, 1992), which are indicators of successful relationship development (Altman & Taylor, 1973; Collins & Miller, 1994; Knapp, 1978). Due to the ease of relationship development using technology, people may not notice that the subsequent

relationship development is not as successful as those developed slower and through face-to-face interactions.

Because of this possibility, there is a need to investigate the use of technology and its effect on interpersonal outcomes when beginning relationships. Despite the growing dependence on technology, is using technology comparable to face-to-face interactions in the successful development of interpersonal outcomes in zero-acquaintance situations? This set of studies is designed to examine these questions. First, to be able to compare technology to face-to-face, we need to know how people communicate and develop relationships face-to-face.

Face-to-Face Self-Disclosure

To determine if technology is a comparable context to face-to-face in relationship development, how relationship development in the face-to-face context needs to be established. As it turns out, how people communicate and develop relationships face-to-face is a well-developed literature.

As social animals, people are motivated to form and maintain relationships with others and readily do so in most circumstances (Baumeister & Leary, 2000). Successful relationships are often marked by the presence of positive interpersonal outcomes, such as closeness and liking (Greene, Derlega, & Matthews, 2006). Forming relationships with others is a complex process and can occur in many different contexts. However, one common and well-validated method to successfully forming positive interpersonal outcomes is through self-disclosure (Altman & Taylor, 1973).

Self-disclosure is the act of sharing an intentional, verbal statement that reveals information about the self to others (Altman & Taylor, 1973; Derlega, Metts, Petronio, & Margulis, 1993; Jourard, 1971a). People often share such self-knowledge to satisfy intimacy

goals, such as developing positive interpersonal outcomes and/or feeling connected to others (Alea & Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005; Hyman & Faries, 1992; Webster, 1997). Indeed, successful self-disclosures often produce feelings closeness and liking towards the person they disclosed to (Altman & Taylor, 1973; Collins & Miller, 1994; Rubin, Hill, Peplau, & Dunkel-Schetter, 1980). As previously mentioned, positive interpersonal outcomes are key indicators of successful interpersonal relationships. A person feeling liking or closeness towards another may perceive their relationship to be a "good" one (e.g., Greene et al., 2006).

However, self-disclosure in and of itself does not beget positive interpersonal outcomes; rather, it acts as a context for this goal (Derlega, Winstead, & Greene, 2008; Greene et al., 2006). In other words, just because one has self-disclosed does not necessarily mean there will be any change in relational closeness or liking. Self-disclosures that result in positive interpersonal outcomes usually follow a slow process of revealing information about the self, as outlined by the social penetration theory (Altman & Taylor, 1973). Social penetration theory posits that gradual, yet informative, increases in self-disclosure are necessary to develop positive interpersonal outcomes. These gradual increases in informative self-disclosures usually escalate based on breadth and depth (Altman & Taylor, 1973; Taylor, 1968). Breadth of self-disclosure refers to the amount of topics about the self that has been disclosed during a conversation. For example, a conversation could cover only favorite sports teams or could cover favorite hobbies, television shows they like, places they've lived, etc. Depth of self-disclosure refers to how personal, or intimate, the disclosures were during the conversation. For example, a conversation could cover summer vacations (i.e., low intimacy) or personal secrets (i.e., high intimacy). Two people in a conversation are likely to stay close to the same breadth and depth level of their self-disclosures (Jourard, 1971a, 1971b; Dindia, 2002), such that those who self-disclose a lot receive

a lot of self-disclosure back (Komarovsky & Phillips, 1962). This in turn affects interpersonal outcomes. People are more likely to like those they have self-disclosed to and received self-disclosures from (Collins & Miller, 1994; Sprecher, Treger, Wondra, Hilaire, & Wallpe, 2013c).

The gradual increase of informative self-disclosures is also posited to be crucial to the beginnings of relationship development (Knapp's model of relational stages; Knapp, 1978). As relationships change and grow, so do the self-disclosures. At the beginning of relationships, the self-disclosures tend to be superficial and abstract (Clark, 1985; Miell & Duck, 1986; Beike, Brandon, & Cole, 2016). In established relationships, the self-disclosures become more intimate and detailed (Alea, 2010; Altman & Taylor, 1973; Beike, et al., 2016). Therefore, socially appropriate increases in breadth and depth of self-disclosure increases both closeness and liking (Altman & Taylor, 1973; Collins & Miller, 1994).

Self-disclosures can have the opposite effect if the informativeness of the self-disclosures do not follow the socially appropriate pattern as outline by social penetration theory. The self-disclosure process is not an easy one. In fact, self-disclosure is an effortful process that is a balancing act of choosing what self-relevant information to share and choosing what to keep private (dialectics; Altman, Vinsel, & Brown, 1981). For example, when talking with a stranger, a likely topic would be to discuss vacations but not secrets. The reason why gradual self-disclosures are successful is because there are privacy boundaries. There are privacy boundaries of what people are willing to share but there are also boundaries on what people are willing to hear (Petrino, 2002). Conversations are a cooperation between two people to exchange information in an understandable way (Grice, 1975). Sharing too much too fast can be alienating instead of closeness inducing because the listener is not willing to hear it or takes it out of context because they do not have enough knowledge base to understand the disclosure (Chaikin

& Derlega, 1974; Petronio, 2002). It can also be potentially risky if the disclosee shares the information with others not chosen by the discloser (Afifi & Steuber, 2009). Thus, choosing what and to whom to self-disclose is a cautious decision-making process, leading to some conversations have much more self-disclosure occur than others (Jourard, 1971a; Omarzu, 2000).

In sum, people can develop new relationships by self-disclosing because self-disclosure often results in positive interpersonal outcomes (i.e., closeness and liking). To get these positive interpersonal outcomes, self-disclosures need incrementally increase in informativeness in breadth (i.e., variety) and/or depth (i.e., intimacy). People are reasonable sensitive to these rules and effective at engaging in the self-disclosure process (e.g., Grice, 1975) and usually approximate the other's level self-disclosures (Jourard, 1971a, 1971b). Although usually slow, this self-disclosure process enables the individuals to build a knowledge base and trust without over disclosing (Dindia, 2000, 2002 for reviews; Greene et al., 2006; Omarzu, 2000).

Face-to-Face Self-Disclosure Mediators

When interacting face-to-face, the fact that informative increases in self-disclosure result in positive interpersonal outcomes is a common finding. Successful self-disclosures can result in both closeness and liking. In a contradictory fashion, the self-disclosure literature often measures both closeness and liking but expect them to produce similar results and do not explicate why they are both measured separately (e.g., Sprecher, 2014a; 2014b). In fact, some research indicates that closeness and liking do not always follow the same development trajectory (e.g., Brandon, Beike, & Cole, accepted; Veniegas & Peplau, 1997). Regardless, little research has directly examined and compared possible reasons for why successful self-disclosure results in both liking and closeness in face-to-face interactions. And so although successful self-

disclosures result in closeness and liking, the reason why self-disclosures result in closeness could be different than the reason it results in liking.

The self-disclosure literature does implicate potential mediators that can predict when self-disclosure will result in positive interpersonal outcomes of closeness and/or liking. The most prominent two in the literature are responsiveness and perceived similarity. A relatively newly proposed mediator is enjoyment of the interaction (e.g., Sprecher, 2014a; 2014b). I also propose a new potential mediator: ease of processing.

Responsiveness. Responsiveness is the amount that a listener demonstrates that they are paying attention to and care about the information shared during a conversation (Miller & Berg, 1984). People like to "[feel] understood, validated, and cared for" (interpersonal process model of intimacy; Reis & Patrick, 1996, p. 537). Responsiveness can be measured across multiple dimensions (Derlega et al., 2008) such as reciprocating a self-disclosure in matching topic (Davis & Perkowitz, 1979), matching intimacy or demonstrating concern (Berg & Archer, 1980), matching topic (Davis & Perkowitz, 1979). Responsiveness doesn't have to be shown with words; it can also be demonstrated using non-verbal cues such as enthusiasm or interest (e.g., eye contact, head nodding, "uh-huh"; Berg, 1987; Miller & Berg, 1984). These methods convey listening and understanding, creating a general feeling of good rapport.

Increased responsiveness has been directly linked with increased closeness (Reis & Shaver, 1988; Reis & Clark, 2013) and has been established a mediator between self-disclosure and closeness. A study had participants keep a diary for 1 or 2 weeks for the purpose of logging disclosures from themselves and from conversation partners (Laurenceau, Barrett, & Pietromonaco, 1998). Disclosure, both self and partner, significantly predicted subjective feelings of closeness, and how responsive the participant felt their conversation partner was

mediated this relationship. If no responsiveness is perceived, self-disclosers might see this as a lack of interest and choose to not only end the conversation but shut down any possibility of a future relationship (Miell & Duck, 1986).

The effect of responsiveness on liking as not been established. Nonverbal responsiveness, such as smiling and head nodding, have been found to predict affiliative behavior, which is akin to liking (Rosenfeld, 1966a; 1966b). Thus, the effect of responsiveness on liking after self-disclosing remains to be addressed.

Perceived Similarity. Another mediator between self-disclosure and positive interpersonal outcomes is perceived similarity (Byrne, 1997; Montoya, Horton, & Kirchner, 2008). The more people self-disclose, the more self-knowledge is shared. The more self-knowledge shared, the more opportunities for two people to find common ground, or things that they both have in common for potential topics of conversation (Clark, 1985). If individuals find common ground, this should open up the opportunity for further self-disclosures, and thus the opportunity for more positive interpersonal outcomes.

One way to define this common ground can be similarity between two conversation partners. Similarity is defined as overlap in attitudes, personality, interests, etc. between two people (e.g., Byrne, 1961). Interestingly, actual similarity is not nearly as important as perceived similarity is on interpersonal outcomes (Montoya et al., 2008; Morry, 2007; Sprecher & Duck, 1994). Judging similarity when forming relationships is based on person perception. People often make empathic inferences about others (Ickles, 2003). In zero-acquaintance situations, people will make educated inferences about others in the absence of actual knowledge. One method to fill the gaps of knowledge about strangers is to socially project, or use self-knowledge as an anchor (Clement and Krueger, 2000; Epley & Waytz, 2010). So in zero-acquaintance

situations, people can use what is disclosed to them as well as their own self-knowledge to make judgments and inferences about the other person.

Increases in self-disclosure can result in greater perceived similarity, which in turn can result in greater liking (similarity-liking effect; Byrne, 1961). The similarity-liking effect is a prominent effect in the social psychology literature, positing that greater perceived similarity results in greater feelings of liking towards the similar other (Layton & Insko, 1974). This effect is a robust finding across a number of dimensions. For example, liking towards others increases when others disclose similar opinions (e.g., Byrne & Nelson, 1965), personality (Gonzaga, Campos, & Bradbury, 2007), interests (Kubitschek & Hallinan, 1998), and shared experiences (Pinel, Long, Landau, Alexander, & Pyszczynski, 2006). Additionally, liking can also increase based on physical appearance (MacKinnon, Jordan, & Wilson, 2011) and attractiveness (e.g., Taylor, Fiore, Mendelsohn, & Cheshire, 2011). Consequently, the less similar an individual perceives themselves to their conversation partner, the less they like them (Norton, Frost, & Ariely, 2007). For example, if what is self-disclosed is dissimilar to the listener's beliefs and attitudes, then liking decreases (Chambers, Schlenker, & Collisson, 2013; Chen & Kenrick, 2002; Rosenbaum, 1986).

What is not established is the effect of perceived similarity on closeness. Those that are in close relationships perceive themselves as being very similar to each other (e.g., Newcomb & Svehla, 1937; as reported in Sprecher, 2014a). This could be due to the fact that people understand other's thoughts and beliefs by using their own and are more inclined to say another is similar rather than different (Epley, Keysar, Van Boven, & Gilovich, 2004). Additionally, perceived similarity has been found to influence both liking and closeness after a similarity

induction task (Sprecher, 2014a; 2014b). However, these limited findings need to be replicated and in more naturalistic settings to be considered a robust effect.

Enjoyment of the Interaction. The self-disclosure literature in social psychology was most prolifically researched in the 1970s and 1980s, according to a PsycInfo search. Since then, published research about self-disclosure has been steadily declining. Susan Sprecher is one of the more prominent self-disclosure researchers today and has been investigating how self-disclosure changes over different contexts. In her research, Sprecher has researched responsiveness (Sprecher, 2014a) and similarity (Sprecher, Treger, Hilaire, Fisher, & Hatfield, 2013c), but also has introduced a new mediator to the literature: enjoyment of the interaction. Successful increases in self-disclosure positively predicted people's subjective enjoyment of their interaction (Sprecher, Treger, & Wondra, 2013a; Sprecher, Treger, Hilaire, Fisher, & Hatfield, 2013b). In fact, participants even felt as though they enjoyed conversations more when creating new relationships than in already developed relationships (Sprecher et al., 2013c). However, there are currently no published investigations of enjoyment for the interaction's influence on closeness and liking, and thus needs inclusion in the existing literature.

Ease of Processing. In addition to the aforementioned variables, I propose that self-disclosure during conversations can result in positive interpersonal outcomes due to how easy and comfortable the conversation was to engage in, or ease of processing.

Ease of processing relates to how easy it is to cognitively process objects and/or people in the environment (Alter & Oppenheimer, 2009b). When stimuli is easier to process, people tend to rate it as more important, accurate, or favorable. However, this ease of processing heuristic is a misattribution process. Just because something is easier to process does not necessarily make it better. Schwarz et al. (1991) demonstrated this by having people make judgments about their

own assertiveness after generating either 6 examples of assertiveness (an easy task) or 12 examples of assertiveness (a difficult task). Those in the easy condition retrieved examples more easily and consequently rated themselves as more assertive. Participants in the hard condition had more difficulty retrieving examples and consequently rated themselves as less assertive. This indicates that ease of processing influenced their judgments about their identities. Ease of processing also extends to people thinking something is more important if it can be easily recalled (Tversky & Kahneman, 1973) or is a personal memory (Jacoby & Dallas, 1981). People also prefer simple words or explanations to verbose and complicated ones (cf. Oppenheimer, 2006). Even wine is perceived to taster better when the label is easier to read (Gmuer, Siegrist, Dohle, 2015). Stimuli that are easier to process can also increase mood and affect (Reber, Winkielman, Schwarz, 1998; Winkielman & Cacioppo, 2001). Thus, things in the environment that are easier and low effort to process are better (e.g., more important, preferred, true, etc).

Self-disclosure could also be subject to this ease of processing heuristic. During a conversation, people both give and receive self-disclosures. If it is easy to self-disclose to someone else and it is easy to understand the received self-disclosures, then perhaps this will encourage us to like them better. In other words, ease of processing can influence individuals to perceive a conversation as better if the self-disclosure is easy to engage in. In the literature, only one study has directly linked ease of processing to self-disclosure. Ease of processing can influence whether someone chooses to self-disclose or not, such that people will not disclose if it is difficult for them to do so (Alter & Oppenheimer, 2009a). This difficulty can be the result of judgment risk (i.e., telling someone you have AIDs and fearing judgment) or if the context is hard to communicate in (i.e., hard to hear the other person, hard to use the medical website). This set of studies indicates if the context is conducive and supportive of self-disclosures, then

people will disclose more. However, the effect of ease of processing on interpersonal outcomes remains unknown.

It is plausible that ease of processing could influence interpersonal outcomes when self-disclosing. People misattribute stimuli more favorably and more important if it is easier to process regardless of content of the stimuli (e.g., Tversky & Kahneman, 1973). Therefore, people could view their conversation partner more favorably if the self-disclosure process is easy. This ease of processing in self-disclosure could occur at two points. First, information can be easy or difficult to share. Sharing information in a clear and easy-to-understand manner is an important part of the conversation process (Grice, 1975). People might find that it was very easy during the interaction to *share* information. If they perceive it to be easy to share, they might also misattribute these feelings towards their conversation partner independent of what the conversation partner does. Second, information can also be easy or difficult to process and understand. People might also find that it was easy during the conversation to *listen and understand* the information, independent of the content. In other words, if things are easier to share or if they are easy to hear, this could very well result in favorable interpersonal outcomes due to the misattribution of ease of processing.

In sum, increases in self-disclosures produce interpersonal outcomes such as liking and closeness. However, it is unclear whether the effect of self-disclosure on closeness is that same as on liking. In the literature, there are two researched, prospective mediators to explain these relationships. Responsiveness has been shown to mediate the on closeness, but liking is under researched. Similarity has been shown to greatly influence liking, but closeness is under researched. Both enjoyment of the interaction and ease of processing could theoretically influence both closeness and liking but have no supporting evidence. Thus, there exists a need to

investigate the effect of self-disclosure on the constructs of closeness and liking. This will help determine whether they are similar enough to garner how the self-disclosure literature often makes similar predictions for them both or they predict successful relationships for different reasons.

Self-disclosure is an effective method to develop relationships; however, this has largely only been researched in face-to-face interactions. Today, more and more people are using technology to develop relationships. How does communication using technology differ from FtF communication?

Face-to-Face and Computer-Mediated Communication

Today, people have many different platforms that they can use to communicate and develop relationships with others. Face-to-face (FtF) has been the tried and true platform. However, people are moving many of their social interactions from the FtF platform to using technology platforms (computer mediated communication; Parks & Floyd, 1996).

Computer-mediated communication (CMC) is generally defined as any communication that occurs between two or more computer-mediated formats (e.g., online forums, blogs, e-mail, instant messaging, social network sites, MMOs; Thurlow, Lengel, & Tomic, 2004; Walther, 1996). Psychological research has increasingly focused more on how people use computer software to manage interpersonal interactions, such as developing and maintaining relationships (Kim & Dindia, 2011; Nguyen, Bin & Campbell, 2011; Walther, 1996; Walther & Burgoon, 1992). This is a much needed area of study, as online relationships are becoming more and more prevalent (Parks & Floyd, 1996).

As communication platforms, FtF and CMC offer different qualities (e.g., Rice & Gattiker, 2001). The two platforms are distinct on factors such as physical proximity,

synchronicity, and nonverbal cues. FtF conversations are traditionally defined as requiring physical proximity and having a synchronous quality, which means individuals are physically close as they converse and have prompt responses after their conversation partner has said something. CMC conversations, on the other hand, can be characterized by the lack of necessity for physical proximity as well having an asynchronous quality (Bryant, Marmo, & Ramirez, 2011). Not only do the disclosures not have to happen in each other's presence but there is no necessity for an immediate response. Taken together, this generally results in FtF communications being more personable but time consuming, while CMC is less personable but easier and convenient.

However, FtF and CMC fundamentally differ on one important dimension, which has been implicated to effectively develop positive interpersonal outcomes: nonverbal cues. Nonverbal cues are signals in the context of a conversation that, in addition to words, can indicate interest and facilitate understanding in a conversation. Nonverbal cues can include physical distance, body orientation and lean, eye gaze, facial expressions, and paralinguistic cues such as rate and tone (Berger & Calabrese, 1975; Burgoon & Le Poire, 1999). In FtF interactions, these non-verbal cues are prevalent when self-disclosing to another person. Nonverbal cues are helpful to communication by adding clarity or emphasis to what is being said (e.g., Sternglanz & Depaulo, 2004). For example, sarcasm is a common rhetoric device that is generally demonstrated by intonation (Colston, 1997; Phillips et al., 2015). A response such as "wow, this sweater is just what I wanted" can be interpreted as sincere or mocking based on the intonation and tone of the speaker's voice. People who know each other well (e.g., friends, romantic partners) have been shown to be fairly accurate at interpreting each other's nonverbal cues (Noller & Ruzzene, 1991; Fleming, Darley, Hilton, & Kojetin, 1990). However, they might

not be any better at this interpretation process with close others than strangers (Sabatelli, Dreyer, & Buck, 1979) or even their own expressions (Ansfield, DePaulo, & Bell, 1995).

Regardless, these nonverbal cues have been shown to mediate self-disclosure and positive interpersonal outcomes. For example, consistent eye-gaze with a conversation partner can be interpreted as interest and thus result in closeness (Argyle, Lefebvre, & Cook, 1976; Exline, Gray, & Schuette, 1985). In fact, seeing non-verbal cues can make others want to mimic them (Bargh, Chen, & Burrows, 1996) and this mimicry in turn can increase liking in relationships (Chartrand & Bargh, 1999). Ultimately, nonverbal cues are helpful to conversations by clarifying and adding additional context to what has been said.

The CMC platform, however, is a context with a distinct dearth of nonverbal cues. CMC, through computers and cell phones, has the advantage in that this platform is easy to use and doesn't require conversation partners to meet up in person. However, the nonverbal cues available in FtF conversations that are helpful to understanding many of the nuances of language that humans have, such as expression on someone's face or the inflection of their voice, are not available. To use a previous example, sarcasm is very hard to detect when there is no vocal intonation to disambiguate what is being communicated (Rockwell, 2000; Whalen, Pexman, & Gill, 2009). This lack of physical proximity, and thus nonverbal cues, is often seen as a con to this platform and thus detrimental to self-disclosure and often results in impersonal communications.

Consider the possibility, however, that perhaps the lack of nonverbal cues could actually be a pro; perhaps even a benefit to self-disclosure. There is a certain degree of anonymity, or disembodiment, when using CMC (see Bordia, 1997, for review). This is called social anonymity. Social anonymity refers to the situation when an individual perceives that they are

anonymous to others, whether this anonymity is true or subjective (Christopherson, 2007). Although anonymity in social psychology has traditionally been thought to result in negative outcomes (Zimbardo, 1969; Zimmerman & Ybarra, 2016), anonymity can be beneficial. Self-disclosure is a balance of revealing information about the self while keeping some information private. Identities don't have to be completely hidden. However, one needs a degree of control over other people's access to said identity and personal information, which is also good for psychological well-being (e.g., Vinsel, Brown, Altman, & Foss, 1980). Privacy is not only expected but healthy in relationships with others, as there is likely "…a close connection between our ability to control who has access to us and to information about us, and our ability to create and maintain different sorts of social relationships with different people" (Rachels, 1975, pp. 333). CMC platforms can also be good for the self-disclosure context because it can allow for a fair field (equalization hypothesis; Dubrovksy, Kiesler, & Sethna, 1991). This means that many of the issues that could result in unfavorable reactions initially can be held at bay, allowing everyone to self-disclose from the same starting line. For example, in professional environments, this can prevent stigmatized groups from being judged by their minority status (e.g., race, gender) before their skills and abilities (Maczewski, 2002; Spears, Lea, Corneliussen, Postmes, & Haar, 2002). In personal relationships, this in a forgiving medium for those who suffer from social anxieties, such as shyness, to be able to form meaningful relationships with others (Brunet & Schmidt, 2008; Ward & Tracey, 2004). Complete anonymity is not necessary for self-disclosure to happen (Christopherson, 2007). The absence of these social cues could lead people to self-disclose more because 1) there is social cues don't inhibit disclosure, 2) disclosure compensates for lack of social cues (Daft, Lengel, & Trevino, 1987), and/or 3) greater self-disclosure on CMC platforms is a social norm (Barak & Gluck-Ofri, 2007). But the absence

of these social cues could lead to people self-disclosing more because of the lack of inhibition that anonymity can provide (Joinson, 2001).

Relatedly, the CMC platform is not a unitary construct. The technology boom now affords people multiple ways to communicate with others that differ widely in the availability of nonverbal, social cues they can offer. For instance, take the context of e-mailing versus social network sites. The e-mail context could be seen as bare of many social cues due to the fact that the primary way to communicate is purely though text, with the help of the occasional emoticon (Thompson, Mackenzie, Leuthold, & Filik, 2016). Although one is not completely anonymous in this type of environment, they are physically removed and "disembodied" from the conversation (Leiter & Dowd, 2010). Thus, they are distanced from nonverbal cues from others that might prevent them from saying too personal of a self-disclosure. Between FtF and e-mailing, social networks sites could be considered a middle ground in nonverbal cues and anonymity. Nonverbal cues are rife in FtF communications but scarce in e-mail communication. Social networks sites have the text information of e-mailing but lack the variety of nonverbal cues of FtF. What social network sites bring to the table is a visual cue. This visual cue is a type of cue called cues to identity, in which some of the perceived anonymity present in CMC is eliminated thanks to this blatant identifying information. Because this more closely approximates FtF interactions, these cues are believed to enhance the CMC platform and the self-disclosure context (cf. Tanis & Postmes, 2007). Self-disclosure is a cautious decision making process and to self-disclosure intimate we need to eliminate under certainty. Uncertainty reduction is an important step in developing relationships (Berger & Calabrese, 1975). These cues to identity allow for the reduction of uncertainty about the conversation partner as well as their intended meaning when self-disclosing.

FtF and CMC are very different platforms. Even though FtF and CMC offer different advantages and disadvantages, are they being used differently to develop relationships? Specifically, are people using CMC to self-disclose as we see in FtF and does it follow the same pattern we see in social penetration theory?

Computer-Mediated Communication Self-Disclosure

Self-disclosure is an effective method for developing positive interpersonal outcomes and, in turn, developing relationships. As seen in the aforementioned literature, self-disclosure research has focused on how people share information about themselves with others in face-to-face (FtF) interactions. Although FtF and CMC are very different communication platforms, people are using both FtF and CMC to form new friendships and romantic relationships (Rosenfeld & Thomas, 2012). However, to be able to compare CMC to FtF on their ability to effectively produce positive interpersonal outcomes, one needs to know whether CMC and FtF self-disclosures are comparable. To do so, one needs to establish a) people are using CMC to self-disclose equivalently to FtF interactions and b) if the self-disclosure process operates in a similar pattern in CMC as it does in FtF interactions.

To address these issues, researchers conducted a meta-analysis on studies that explicitly compared FtF and CMC with self-disclosure (self-report or actual) as the outcome variable (Nguyen et al., 2011). While initially forty-six abstracts were found to meet this outcome criterion, studies were eliminated if they were 1) a non-English publication, 2) self-disclosure wasn't actually compared across conditions, 3) self-disclosure did not occur between two people, or 4) if the data were published twice. This left a sample of fifteen studies, six of which were experimental. Across these studies, people self-disclosed equally in both FtF and CMC interactions. When examining the quality of the self-disclosures (e.g., frequency, breadth, and

depth), the CMC condition had the greatest frequency of self-disclosure. The fact that people are telling each other more via CMC lends some credence to the argument that the CMC platform allows for greater self-disclosure because it does not inhibit. Due to the sample of studies, it is unclear whether breadth or depth is greater in FtF versus CMC. It should be noted that the CMC platforms in this meta-analysis were characterized by no physical proximity and asynchronicity, but they also lack any kind of visual cue. Thus, this meta-analysis demonstrates that self-disclosure does occur in both FtF and CMC platforms mediums, even in contexts will limited availability of nonverbal cues. However, CMC is not a unitary platform, there are other CMC methods that fall on the continuum between the way this meta-analysis defined its platforms. Thus, self-disclosures are about the same across the FtF and CMC platforms, but does not address the nonverbal cue nuances.

Not only are people self-disclosing about equally on FtF and CMC platforms, but the pattern of self-disclosure on CMC appears to be the same as in FtF interactions, using social penetration theory (Chan & Cheng, 2004; Parks & Floyd, 1996; Yum & Hara, 2005). According to self-report measures, breadth and depth are both used to develop relationships and both result in favorable interpersonal outcomes such as closeness and liking (Chan & Cheng, 2004; Parks & Floyd, 1996; Yum & Hara, 2005). While it appears all cultures use this strategy, it is unclear if there are cultural differences in how much people rely on this strategy (e.g., Yum & Hara, 2005). Though they are self-report, these studies are consistent with the social penetration theory that self-disclosure changes correlate with relationship development.

In sum, FtF and CMC are distinct platforms that have the same self-disclosure patterns. The FtF and CMC platforms differ in necessity for physical proximity, synchronicity, and nonverbal cues. The literature has largely focused on this last difference. FtF is inundated with

nonverbal cues, whereas CMC has a distinct lack of nonverbal cues. However, there is a continuum of nonverbal cues between FtF and CMC, such that technology communications can have few nonverbal cues (e.g., e-mailing), some cues (e.g., social network sites), or almost as many cues as FtF (e.g., video Skype). Despite their communication differences, people use both FtF and CMC to self-disclose to others. These CMC self-disclosures also appear to follow the same process and predictions as FtF disclosure theory of social penetration.

So even though FtF and CMC are different communication platforms, they have similar self-disclosure patterns. Self-disclosure influences positive interpersonal outcomes. Can FtF and CMC platforms produce similar positive interpersonal outcomes?

Face-to-Face vs. Computer-Mediated Communication: Theory

Some theories say no, CMC is not as effective as FtF at producing positive interpersonal outcomes. According to the *media richness theory*, both FtF and CMC channels of disclosure can be ranked on a richness continuum (e.g., Daft & Lengel, 1984). The perceived richness of the channel translates to the ability of nonverbal cues to be used and perceived, how much information about the self that can be shared, and the intimacy that can be attained (Hu, Wood, Smith, 2004). In other words, self-disclosing on the FtF platform allows for people to share information and express emotions, both verbally and nonverbally. Thus, this medium is "richer" and allows for a greater extent of closeness and/or liking. Additionally, the *cues-filtered-out* theory speculates that attaining positive interpersonal outcomes can be challenging, if not impossible, to achieve given the reduced verbal and nonverbal cues (Kesler & Sproull, 1992). The clear set of verbal and nonverbal cues in FtF communication can help to set expectations and parameters for self-disclosures, which plays a role in deciding to self-disclose as well as forming

accurate first impressions (Okdie, Guadagno, Bernieri, Geers, & Mclarney-Vesotski, 2011; Ramirez & Burgoon, 2004).

Some theories say yes, the CMC platform are comparable to the FtF platform at producing positive interpersonal outcomes. Even though the CMC platform can have a dearth of nonverbal cues, it can still produce positive interpersonal outcomes because people have adapted to the context. In fact, *social information processing* (SIP) theory speculates that CMC is a prime candidate for interpersonal communication (Walther & Burgoon, 1992). This theory acknowledges that both verbal and nonverbal cues are crucial for effective communication; however, people have adapted the CMC context to overcome this limitation (Nguyen et al., 2011; Walther & Burgoon, 1992). To accommodate for the scarcity of cues, there are two possible ways to compensate. First, CMC methods (i.e., social network sites, e-mail, text messaging) need to become richer with other types of cues, such as emoticons (Thompson et al., 2016; Walther, 1996). Second, self-disclosures can increase to compensate where cues are limited because people are limited in other options by which to transmit information (Walther & Burgoon, 1992). As previously mentioned, this lack of cues might be beneficial because it doesn't inhibit the sharer (*reduced-cues theory*; Suler, 2004). In other words, not having the visual cues eliminates the inhibition of social anxieties and physical characteristics (Brunet & Schmidt, 2008; McKenna & Bargh, 1999). For example, people are not always consciously aware of the facial expressions they are making (Rinn, 1984), such as the phenomenon of "resting bitch face" (Saedi, 2015; Macbeth & Rogers, 2016). People are not always aware of their facial expressions, yes others are interpreting them and this interpretation can affect future disclosures (Ekman, 1977; Gottman, Levenson, & Woodin, 2001). If an individual's "resting face" is demonstrating contempt, this will shut people off from further disclosures. Because of

this lack of nonverbal cues, closeness and intimacy might develop quicker on CMC platforms because the exchange is focused on what is being shared (McKenna et al., 2002). The asynchronicity of CMC enables people to take time and think about what they are sharing and what is being shared. This allows for greater control over self-presentation and more intense, though less detailed, perceptions of the partner (*hyperpersonal CMC* theory; Walther, 1995, 1996; Tidwell & Walther, 2002). This means greater self-disclosure, which in turn should result in exaggerated interpersonal outcomes. Thus, self-disclosing on CMC platforms could result in comparable positive interpersonal outcomes as FtF self-disclosure because people have adapted the context (Bryant, Marmo, & Ramirez, 2011).

To briefly recap, FtF and CMC platforms are different contexts by which people can self-disclose to others. FtF and CMC platforms differ along a continuum of modality richness. FtF is very rich because it has a plethora of cues, including nonverbal cues. CMC platforms (e.g., e-mail) are scarce in cues available during FtF interactions. There are other types of CMC methods (e.g., social network sites) that fall in the middle of this continuum because these sites have the textual information of very scarce CMC methods in addition to having some cues to identity (e.g., visual cue like profile picture). Despite these differences, both CMC and FtF platforms are used to self-disclose and the pattern of self-disclosure is similar. Since incremental increases in self-disclosure lead to positive interpersonal outcomes in FtF interactions, one should expect the same in CMC interactions.

Contrary to this assumption, theories are conflicted about whether CMC can produce positive interpersonal outcomes comparable to FtF. Some claim that CMC communications restricts how much the listener learns about the discloser (Greene et al., 2006) while others believe the lack of nonverbal cues leads to disclosing more and more openly in CMC

communication (e.g. McKenna et al., 2002). The major difference between the yea-sayers and nay-sayers of CMC being able to produce positive interpersonal outcomes is the absence of nonverbal cues and what, if anything, people have done to deal with the lack of cues. CMC could either be an effective self-disclosure platform and ineffective on due to the lack of nonverbal dues.

Face-to-Face vs. Computer-Mediated Communication: Research

One of the new challenges of psychological research is staying abreast of the new technological developments and their impact on society. Given the recency of the technology boom in interpersonal communications, there is not a plethora of research regarding self-disclosures on the CMC platform and its impact on positive interpersonal outcomes, much less in zero-acquaintance situations. Currently, the CMC literature has investigated this effect by treating CMC and FtF as both a dichotomy of nonverbal cues and a continuum of nonverbal cues, as well as after only one interaction and after two interactions.

Unfortunately, the research that has been published also demonstrates contradictory results, much like the previously reviewed theories. One study compared the effect FtF versus CMC platform self-disclosures on liking after a getting-to-know you exercise designed to induce closeness (Aron, Melinat, Aron, Vallone, & Bator, 1997) amongst thirty-two mostly same sex dyads (McKenna et al., 2002). Results showed no difference in liking between FtF and CMC. Other studies find support that FtF is superior in producing positive interpersonal outcomes. 32 mostly same sex dyads engaged in the same getting-acquainted exercise (Aron et al., 1997) with a 30-minute time limit either FtF or using online chat (Netmeeting; Mallen, Day, & Green, 2003). Participants in the FtF condition experienced increases in closeness and satisfaction with the interaction. A recent study found similar result with 68 mostly same-sex dyads who engaged

in a 10-minute free form conversation either FtF or chatting using an internet chat (Okdie et al., 2011). Participants in the FtF condition reported increases in both closeness and liking compared to CMC. Interestingly, participants self-reported that the FtF was more difficult to communicate through than the CMC.

These three studies treat FtF and CMC at opposite ends of the nonverbal cue spectrum and find three different results. One study found no difference in liking between CMC and FtF (McKenna et al., 2002), one found increase in closeness for FtF (Mallen et al., 2003), and one found increases in both for FtF (Okdie et al., 2011). The first two used getting-acquainted exercises designed to increase closeness and the last used a free-form conversation. These studies are limited by treating FtF and CMC as dichotomies rather than a continuum. However, sometimes visual cues, or cues to identity, are not always beneficial. In fact, sometimes anonymity is preferred to half measures of nonverbal cues (e.g., preferring e-mailing to the profile pictures of social network sites because the picture is not quite like FtF). These cues to identity have been found to be associated with greater dissatisfaction with conversations (Tanis & Postmes, 2007). This could be due to the fact cues to identity, such profile pictures, limit the amount the individual can influence the impressions others will make (Walther et al., 2001).

Studies that include multiple types of CMC to test the continuum of nonverbal cues between FtF and CMC support the theories that FtF is superior at developing interpersonal outcomes. Eighty same sex dyads interacted for 20-minutes using getting-acquainted questions through FtF or one of three different CMC types: text chatting, audio-conferencing, or video-conferencing (Ramirez & Burgoon, 2004). Conditions greater in modality richness, such as FtF and video-conferencing, had greater interpersonal outcomes if the information shared was considered positive. Outcomes decreased if the information shared was negative. This same

pattern of results was found in a study that used text chat, text chat with their conversation visible on the computer screen, or FtF (Antheunis, Valkenburg, & Peter, 2007). In a slight variation, a study compared text chat, audio, avatar communication, or FtF after a free form conversation (Bente, Ruggenberg, Kramer, & Eschenburg, 2008). Results showed that text chat had significantly reduced interpersonal outcomes, but all other conditions did equally well as producing interpersonal outcomes (Bente et al., 2008). The most recent study examining this phenomenon also included the effect of responsiveness and personality on closeness and liking (Sprecher, 2014a; 2014b). Ninety-two mostly same-sex dyads communicated through text only, audio-conference, video-conferencing, or FtF. Interpersonal outcomes were highest in the FtF condition and lowest in the text only condition. Responsiveness was also found to be lower in the text only condition, but was treated as an interpersonal outcome instead of a mediator for interpersonal outcomes, as it has been done in the self-disclosure literature (Laurenceau et al., 1998). Thus, studies that examine FtF and CMC along a nonverbal cue richness continuum find that more cue richness results in greater interpersonal outcomes.

The CMC literature not only has researched CMC and FtF as dichotomies and a continuum, but also across interactions. In other words, many of the studies examine these interactions at two time points. Media multiplicity is a theory which posits that a combination of FtF and CMC is greater than either of these methods alone (Kraut et al., 2002). It is common for people to engage in mixed mode relationships (Walther & Parks, 2002). For example, those who meet on dating websites eventually meet in person (e.g., Ramirez, Sumner, Fleuriet, & Cole, 2015). Measuring interpersonal outcomes after two opportunities to self-disclose also makes sense as self-disclosure is transactional (transactional, Greene et al., 2006). Since self-disclosure is a slow, gradual process, it takes time to unfold. Additionally, conversations have a starting

and stopping point, at which point there needs to be a break before continued self-disclosure can occur.

Many of the articles mentioned above measured interpersonal outcomes across two time points. The McKenna et al. (2002) study found that liking did not differ in liking after the first interaction, but the greatest liking was found when participants first interacted through CMC and then FtF. In fact, there was a slight decrease in liking after the second interaction when both conversations happened FtF. The Sprecher (2014) had all pairs engage in a second getting-acquainted self-disclosure task over video Skype. After the first interaction, the text only condition produced the least interpersonal outcomes. After the second interaction, all conditions were roughly equal across both closeness and liking. Interestingly, the smallest interpersonal outcome increases were in dyads that interacted using the same platform for both interactions (CMC-video). This subset of studies once again indicates that the differential effect of CMC and FtF self-disclosures on positive interpersonal outcomes is far from clear. However, there is strong evidence to support the theory that a combination of FtF and CMC methods might result in greater interpersonal outcomes than a one method type by itself.

The answer to whether technology is an inferior method to communicating compared to face-to-face remains unclear. Many of the reviewed studies that FtF could be the superior platform to developing interpersonal outcomes of closeness and liking because of its richness of cues, as the media richness theory posits. However, this finding is only robust where FtF and CMC are treated along a continuum with multiple conditions of CMC. If FtF and CMC are treated as a dichotomy, there is contradictory results. After a second interaction, all platforms do equally well.

In sum, it is unclear at this point what the effect of the CMC platform on positive interpersonal outcomes is after self-disclosure, compared to the FtF platform. In FtF interactions, people develop relationships by incrementally increasing self-disclosures over breadth (variety) and depth (intimacy; Altman & Taylor, 1973). Dyads in a conversation typically match each other's incremental disclosures (Jourard, 1971a, 1971b). When done successfully, these self-disclosures result in positive interpersonal outcomes of liking and closeness (e.g., Collins & Miller, 1994). However, it is unclear whether closeness and liking result from self-disclosure for the same or different reasons. Research demonstrates that responsiveness influences closeness and perceived similarity influences liking. Enjoyment of the interaction and ease of processing could also explain self-disclosures relationship with both closeness and liking. Regardless of the reasons why self-disclosure produces positive interpersonal outcomes, self-disclosure occurs similarly in the CMC and FtF platforms, despite their context differences. CMC differs from FtF in physical proximity, synchronicity, and most importantly in non-verbal cues. FtF and CMC platforms theoretically exist along a continuum of nonverbal cues. FtF has a plethora of nonverbal cues, whereas CMC has a scarcity of cues. However, some CMC methods have more nonverbal cues (e.g., social network sites) than others (e.g., e-mailing). The presence of cues to identity, such a photo, should make it more akin to a FtF interactions and thus should result in a better interaction (cf. Tanis & Postmes, 2007). Although FtF and CMC are fundamentally different platforms in context, they are both used for self-disclosure purposes and follow the same pattern of incremental disclosure (Nguyen et al., 2011). If self-disclosure in FtF interactions leads to positive interpersonal outcomes, and self-disclosure in CMC interactions is comparable to FtF, then CMC interactions should result in similar positive interpersonal outcomes. However, theories make conflicting predictions about

whether CMC self-disclosures can produce positive interpersonal outcomes compared to self-disclosures on the FtF platform. Current studies seem to support the theories that argue for the FtF platform being the superior platform for developing interpersonal outcomes. However, this finding does not extend to when FtF and CMC are tested as extremes on the nonverbal continuum, or after a second interaction. In fact, using FtF and CMC platforms across different interaction might have an additive effect on interpersonal outcomes, far and above what one method can do alone.

Statement of the Problem

The jury is still out regarding whether self-disclosures on CMC and FtF platforms are comparable at developing positive interpersonal outcomes in zero-acquaintance scenarios. While many theories (e.g., Walther, 1993) and research (e.g., McKenna et al., 2002) indicate that CMC and FtF platforms might be comparable in developing positive interpersonal outcomes, many studies indicate that FtF is a preferable platform (e.g., Okdie et al., 2011). The fact that there are contradictory theories and findings indicate that continued light needs to be shed on this matter. Based on the published literature, there are limitations and important considerations that could help explain the conflict.

A major limitation to the current studies is the operational definition of the CMC platform and its variants based on nonverbal cues. For example, many studies (e.g., Sprecher, 2014b) did test FtF and CMC along a continuum of nonverbal cues. However, the CMC conditions were done via Skype or Netmeeting, a Microsoft rendition of Skype (Mallen et al., 2003). These software programs are convenient, as they are a one-stop shop for a variety of communications that differ in cue availability (e.g., text only, video conferencing). However, these software programs are not the most ecologically valid. Outside of business ventures,

NetMeeting is not widely used and is no longer available on new Windows systems. Skype is also not widely used for interacting with strangers outside of business ventures, though it is useful and widely used for maintaining relationships (e.g., Caparrotta, 2013; Vlahovic, Roberts, & Dunbar, 2012). Due to the limited range of software used in the studies, it is hard to say if these results are generalizable. It could be that Skype is not an effective platform for positive interpersonal outcomes. Replicating this using more widely used programs for interpersonal communication (e.g., e-mail, population instant messaging platforms, Facebook) is necessary.

Relatedly, an additional limitation in the aforementioned studies is that all of these studies address the computer medium of the CMC platform. Computers are not the only technology people frequently use to communicate with others. Text messaging is the most frequently reported behavior on cell phones (Duggan & Smith, 2013) and is not only a preferred method of contact but an integrated part of many youth's daily lives (Skierkowski & Wood, 2012).

I initially decided to examine these two limitations in a pilot study for the current set of studies. Sixty-five zero-acquaintance dyads (M_{age}=22.85, SE = .35) self-disclosed together in a brief getting-acquainted exercise either 1) face-to-face, 2) via text messaging on a smart phone, or 3) via e-mail on a desktop computer. All dyads then had a five-minute conversation face-to-face together. Closeness measures were taken after both interactions. After the getting-acquainted exercise, there were no significant differences in closeness across conditions. All conditions had increased closeness from the first interaction to the second interaction. After the five-minute conversation, the text-messaging and e-mail conditions had significant greater closeness than the FtF condition. These results indicated two things. First, these results are contradictory with the majority of the literature by supporting the idea that technology is not

detrimental to creating relationships compared to FtF. In fact, when taking into account media multiplicity, technology had greater closeness gains than FtF. Second, both text-messaging and e-mail are comparable "scarce" cue CMC platform methods. In this pilot study, participants self-reported having the greatest preference for text messaging to communication with others, followed by face-to-face, and then social networks sites. The least preferred method was Skype, right below calling someone on the phone. It is possible that the reason the text-based CMC methods in the previous studies did not produce interpersonal outcomes was because participants were not comfortable with the interface. The participants in the pilot study could have experienced greater feelings of closeness because they were communicating with a message channel (i.e., text messaging) that they are very comfortable using. Ease of processing could explain this finding, in that participants misattribute feeling closer to their conversation partner because of how easy it was to communicate with them. Also, no measures of subjective perceptions of self-disclosure were taken. Thus there is no way to tell if perceptions of self-disclosure differed across conditions.

Finally, neither the FtF or CMC self-disclosure literatures have sufficiently addressed the reasons why self-disclosure effects both closeness and liking. In FtF interactions, increases in self-disclosure produces both closeness and liking (Altman & Taylor, 1973; Collins & Miller, 1994). Research in the self-disclosure literature often measures one or both, often assuming they will have similar results (e.g., Sprecher, 2014a; 2014b) even though they do not always follow the same pattern (e.g., Brandon, Beike, & Cole, 2016; Veniegas & Peplau, 1997). Possible mediators have been investigated, including responsiveness and perceived similarity. Increases in self-disclosures have been found to influence responsiveness and perceived similarity. Responsiveness can influence closeness and intimacy, but there is a lack of research

investigating liking. Conversely, perceived similarity has been found to influence liking, but there is a lack of research investigating closeness. After an exhaustive literature review, two new variables could be potential mediators: enjoyment of the interaction and ease of processing. If people enjoy their interaction, that affective feeling could lead to feelings of closeness and liking. And if it is easy to self-disclose and understand other's self-disclosures, people might misattribute this ease of processing for an "instant connection" which could then produce closeness and liking. Therefore, there is a need in the self-disclosure literature to investigate reasons why self-disclosures result in closeness and/or liking.

Overview of Studies

The following two studies were designed and run concurrently to examine two questions. First, is there a difference in the effect of FtF and CMC platform self-disclosures with strangers on positive interpersonal outcomes? Second, what mediators can explain the relationship between FtF and CMC self-disclosures and positive interpersonal outcomes?

To examine the first goal, both studies had zero-acquaintance dyads interact in one of three conditions: FtF, instant-messaging with a picture, and text-messaging. This allowed for a comparison of FtF and CMC platforms along a nonverbal cue continuum. The text-messaging condition had the least amount of nonverbal cues, FtF had the most nonverbal cues, and the instant-messaging condition fell approximately in the middle.

Text-messaging was chosen as the scarcest cue condition for two reasons. First, it is one of the more popular CMC methods people use to develop and maintain relationships (Luo & Tuney, 2015). Second, the pilot study indicated that this condition was comparable to its computer counterpart (i.e., emailing) in developing interpersonal outcomes.

The instant messaging with a profile picture attached was chosen as the middle ground between FtF and text messaging for two reasons. First, it represents a cues to identity condition. Second and related to the first, it is an analogy a common method people develop and maintain relationships, which is through social network sites (e.g., Ellison, Steinfeild, & Lampe, 2007). Using an actual social network site would result in a very limited sample of participants. All participants in the study would need to be subscribed to a social network site (e.g., Facebook) and would need to have a picture of themselves as their profile picture. The sample would be limited and biased to those who would self-select into these studies based on those requirements. Instead, an instant messaging program (G-chat) which allowed users to see photos of each other was used as an analogous CMC platform. This approximated the modality richness of a social network site or online dating site (e.g., Finkel et al., 2012) while not limiting or biasing the sample.

While both studies used the aforementioned three conditions, the two studies differed to test the nuances in the literature. Study 1 had a high level of control and internal validity and study 2 had lower levels of control to afford external validity. First, studies have differed in how they allowed their participants to self-disclose across the FtF and CMC platforms, and I thought a comparison was necessary. In study 1, self-disclosure was controlled through a getting-acquainted exercise similar to those used in previous studies (e.g., Sprecher, 2014b). In study 2, self-disclosure was allowed to develop more naturally through free-form conversations, which other studies have used (Okdie et al., 2011). This afforded the ability to measure both internal and external validity of the results. The getting-acquainted exercise simulates the pattern of self-disclosure in social penetration theory. However, this is not exactly how conversations naturally occur, which study 2 is be a better representation of. Second, the studies differed in how many

conversations the dyads had. In study 1, the dyads only had one interaction: the getting-acquainted exercise. In study 2, the dyads had two free-form conversations to test for the media multiplicity effect. Finally, the studies differed on the recruitment of dyads. Study 1 recruited one participant to do a getting-acquainted exercise with a confederate who was a stranger to them. This allowed for the control of physical appearance and information shared. Study 2 recruited two participants to have two free-form conversations, allowing it to be more naturalistic.

To examine the second goal, both studies also collected measures from participants to test for the implicated mediators of responsiveness, similarity, ease of processing, and enjoyment of the interaction. If there is a difference between FtF and CMC self-disclosures and their effect on positive interpersonal outcomes, these measures could potentially help explain why the differences exist.

Study 1

Study 1 was a controlled test of the effect of FtF and CMC platform self-disclosures on positive interpersonal outcomes (i.e., closeness, liking). Dyads did a getting-acquainted exercise either FtF, instant-messaging with a picture, or via text-messaging. The getting-acquainted exercise allowed for control over the breadth and depth of self-disclosures, thereby simulating optimal self-disclosure patterns as positing by social penetration theory. Dyads were comprised of a participant and a confederate. The confederate allowed for further control of self-disclosures as well as control for physical appearance. The control of self-disclosures ideally leaves only the effect of the platform on interpersonal outcomes. If what is being shared in each condition is the same and who is sharing relatively stable, then any differences in interpersonal

outcomes between the conditions should be due to the effect of the platform. This leads me to my first hypothesis:

> *H1*: FtF will not produce significantly greater closeness or liking compared to text messaging or instant messaging, after the getting-acquainted exercise.

Although CMC has been shown to produce lower ratings of interpersonal outcomes in previous studies (e.g., Okdie et al., 2011; Sprecher, 2014b), this could be due to the fact that researchers are using convenient CMC platforms rather than popular platforms. My pilot study provides initial evidence that perhaps this is the case. Using text-messaging and e-mailing rather than Skype tapped into effects from more ecologically valid platforms. This possibility is reinforced by the fact that participants themselves rated text-messaging as one of the most used CMC methods for developing and maintaining relationships, followed closely by social networks sites. Therefore, I expect both my CMC platform conditions (text-messaging and instant-messaging with a picture) to do equally well in producing positive interpersonal outcomes, compared to the FtF platform.

In addition to testing for the effect of self-disclosures across different platform types on closeness and liking, this study also collected measures to test for potential mediators in the relationship between self-disclosure and closeness and liking. Little research has investigated potential mediators between self-disclosure and both closeness and liking, and no studies have tested said mediators simultaneously to test their unique effects. This leads to the other three hypotheses:

H2: Increases in perceived self-disclosure will positively predict both closeness and liking.

H3: In the self-disclosure and closeness relationship, responsiveness, enjoyment of the interaction, and ease of processing will be significant mediators.

H4: In the self-disclosure and liking relationship, similarity, enjoyment of the interaction, and ease of processing would be significant mediators.

Effective increases in self-disclosure have been found to produce closeness and liking. Although I am controlling for self-disclosure and expect it's influence to be similar across platform types, there will be variability across each session how much self-disclosure actually occurs. Therefore, I expect to find a relationship between increases in self-disclosure and both closeness and liking.

In the self-disclosure and closeness relationship, I expected that responsiveness, enjoyment of the interaction, and ease of processing would be significant mediators. There is a substantial amount of literature establishing that responsiveness can explain how self-disclosure influences closeness, and thus expect to find this replicated in this study.

In the self-disclosure and liking relationship, I expected that similarity, enjoyment of the interaction, and ease of processing would be significant mediators. There is a substantial amount of literature establishing that similarity responsiveness can explain how self-disclosure influence liking, and thus expect to find this replicated in this study.

Enjoyment of the interaction could mediate both relationships. Increases in self-disclosure predict increases in how much people enjoy their interaction. If people are enjoying

their interaction, this positive feeling could promote people to like and feel close to their conversation partner.

Finally, ease of processing could mediate both relationships. As previously mentioned, ease of processing is a misattribution process by which people place more weight (i.e., importance, preference, etc). if something is easy to process and understanding. Thus, people might misattribute how easy the self-disclosure process was with feelings of liking and closeness.

Method

Participants. One hundred and seven University of Arkansas undergraduate students participated in this study in exchange for partial fulfillment of their General Psychology course credit. The only pre-requisites for this study were that participants had to be 18 years or older.

Five participants were eliminated from the sample due to non-completion of the questionnaire, leaving 102 participants for the final analysis. The students averaged 19.79 years of age (*SE* = .47), were mostly female (69.6%), and ethnically identified as 74.0% White/Caucasian, 12.7% Black/African-American, 2.0% Asian/Asian-American, 4.9% Hispanic/Latino, 2.0% Native American, and 2.9% Biracial (i.e., identifying as two races).

Procedure. Participants were recruited through the SONA research participation portal, under the description that this study was investigating how people get acquainted with strangers. Each session in the SONA system had one participant sign-up slot. For each session, an experimenter ran each participant through a getting-acquainted exercise with a stranger, who was a confederate in the lab.

There were eight research assistants[1] assigned for this study, who were scheduled to run each session slot in pairs. During each scheduled session, one research assistant was the experimenter and the other was the confederate. All were trained to do both roles and instructed to alternate roles. If one of the research assistants knew the participant after seeing their name in the SONA system, the research assistant was instructed to be the experimenter, to ensure that both the participant and confederate had zero-acquaintance before the start of the study.

The participant and confederate were randomly assigned to do the getting-acquainted exercise via FtF, instant messaging with a photo, or text-messaging. In the FtF condition, the confederate waited in the experimental waiting area to maintain the cover of being another participant. In the instant messaging and text messaging conditions, the confederate waited in an alternate lab room close to the lab room the participant would be brought to, but out of view of the participant. This was to ensure that participants had no visual information about the confederate prior to the getting-acquainted exercise.

At the start of each session, participants were met in the experimental waiting area of the psychology building by the experimenter. The experimenter brought the participant back to the lab room, as well as the confederate in the FtF condition. The participant completed the informed consent and were told they would be doing a getting-acquainted exercise with a stranger, followed by a questionnaire.

The getting-acquainted exercise was a revised version of the Relationship Closeness Induction Task (Sedikides, Campbell, Reeder, & Elliot, 1999; Sprecher et al., 2013a). The task is designed to mimic the pattern self-disclosure typically follows, according to social penetration

[1] Research assistants were varied across gender, race, and appearance, but were in close in age to the mean of the participants.

theory, through turn taking and increases in both self-disclosure breadth and depth. There are three lists of questions (see Appendix A). Within each list were a variety of questions for participants to answer and each list increases in intimacy of questions. The question list was given to both the participant and the confederate. They were instructed to take turns asking questions that both of them answered, and to try to get through as many of the questions as they could within the time limit. They were warned that their conversation would be recorded and so not to discuss anything sensitive, embarrassing, or that involved criminal behavior. Confederates kept their information constant across conditions, though not memorized or wrote to keep the exercise more natural and less practiced.

The location and length of the getting-acquainted exercise varied FtF versus the CMC conditions. In the FtF condition, both the participant and the confederate completed the exercise in the same lab room. The experimenter turned on a video camera at the beginning of the exercise to record the conversation. The first list was allotted one minute, the second list three minutes, and the third list five minutes, totaling nine minutes for the getting-acquainted exercise. In both the instant-messaging and text-messaging conditions, the participant and confederate were in separate rooms for the exercise. In the text-messaging condition, the participant and confederate were each provided a smart phone (Virgin Mobile LG Tribute LS660). In the instant messaging condition, they were each provided with a computer (Dell desktop). The experimenter then helped the participant take a picture of themselves using a provided webcam and upload it to G-chat, an instant-messaging function through G-mail. In both CMC conditions, the first list took two minutes, the second list six minutes, and the third list ten minutes, totaling 18 minutes for the getting-acquainted exercise. The additional time was allotted in the CMC conditions because they require additional time to type out responses on a cell phone or

computer that is not required face-to-face. It is not a new practice in this literature to grant this time (e.g., Sprecher, 2014b) as it helps provide enough time for about the same amount of information to be shared (Walther, Deandrea, & Tom Tong, 2010). Though they are spending more time on the task, the dyad isn't spending it in each other's presence, at least reducing either a mere exposure effect (Zajonc, 1968) or proximity effect (Kahn & McGaughey, 1977). After each timed list, the experimenter re-entered the room and instructed the dyad to move on to the next list. The exercise was done in private but recorded (i.e., video camera, text-message history, instant-message chat window).

After the getting-acquainted exercise, the participant and confederate separately filled out a questionnaire. Those in the instant-messaging and text-messaging conditions stayed in their separate rooms. In the FtF condition, the person closest to the door (either the participant or confederate) filled out their questionnaire at a table in the hallway while the other stayed in the lab room. After completing the questionnaire, participants were then debriefed about the study. They were told that their conversation partner was a confederate in the lab, but that they were in fact a student at the University of Arkansas and answered the questions honestly, ensuring that it was a real getting-acquainted exercise with a stranger.

After the participant left, the experimenter saved the text-message conversations or instant-message chat window and deleted them to ensure other participants did not see previous conversations.

Questionnaire Measures. The following measures were included in the questionnaire given to participants and confederates after the getting-acquainted exercise (see Appendix B). Since the three conditions were designed to differ based visual non-verbal cues, a manipulation check was included to see if participants across conditions used this cue. Two indexes of

questions to assessed for positive interpersonal outcomes of closeness and liking. There was an index of questions used to assess for amount of perceived self-disclosure. There were four indexes of questions to assess for the four proposed mediators: responsiveness, perceived similarity, ease of processing, and enjoyment of the interaction. Finally, items were included in the questionnaire to assess for quality of the conversation. Positivity of self-relevant information shared and mood can influence self-disclosures and interpersonal outcomes (Brandon, et al., accepted; Forgas, 2011; Lambert et al., 2013). Including these items ensure that interpersonal outcomes are being influenced by the platform type rather than other sources, such as mood. At the end of the questionnaire were basic demographic information as well as an inquiry if they were suspicious about the experiment and, if so, why.

Manipulation Check. The chosen platform types (FtF, instant-messaging with a photo, and text-messaging) differed based on visual non-verbal cues. A manipulation check item ("I learned a lot about my conversation partner based on their appearance") was included to determine if participants noticed and used the information. Participants should use visual information the most in the FtF condition, somewhat in the instant-messaging with a photo, and not at all in the text-messaging condition. This item was measured using a 7 point Likert scale (1 = *not at all*, 7 = *very much*).

Quality of the Conversation. Additional items were included to assess for quality of the conversation. These were included to help rule out alternative explanations for the effect of platform type on positive interpersonal outcomes. Items included positivity of the information (e.g., "I feel like the information shared was positive"; 1 = *not at all* to 7 = *very much*) and comfort with the self-disclosures (e.g., "I felt uncomfortable with the information shared"; 1 = *not at all* to 7 = *very much*). An abbreviated version of the Positive And Negative Affect

Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to check that any obtained results were not a product of mere changes in affect (1 = *not at all, 5 = extremely scale*).

Closeness index. Closeness was measured using five items, which have been used in previous experiments (Beike et al., 2016). First, participants were asked "I feel close to my conversation partner" (1 = *not at all*, 7 = *very much*). Second, participants measured closeness through the Inclusion of Other in the Self (IOS) item, consisting of 7 Venn diagrams showing gradually increasing perceived overlap between the self and conversation partner (IOS; Aron, Aron, & Smollan, 1992). Third, participants assessed "How likely would you be to use the term "we" to characterize you and your conversation partner" (1 = *not at all*, 7 = *extremely*). Finally, participants ranked how close they felt to their conversation partner based on their closeness to others ("Relative to all your other relationships (both same and opposite sex), how would you characterize your relationship with your conversation partner?"; "Relative to what you know about other people's close relationships, how would you characterize your relationship with your conversation partner?"; Berscheid, Snyder, & Omoto, 1989) using a Likert Scale (1 = *not at all close*, 7 = *extremely close*). These five items were averaged into a closeness index ($\alpha = .84$).

Liking. Liking was calculated using four self-report items. First, participants were asked "I like my conversation partner" using a Likert scale (1 = *not at all*, 7 = *very much*). The other two items were adapted from Byrne's (1971) Interpersonal Judgment Scale by Sprecher (2014a). The first Byrne item asked about general feelings (1 = *I feel that I would probably dislike this person very much*, 7 = *I feel that I would probably like this person very much*) and the second Byrne item asked participants about their desire to work with the person again in an experiment (1 = *I believe that I would very much dislike working with this person,* 7 = *I believe that I would very much enjoy working with this person*). I added one more measure about spending personal

time with the person outside of the lab (1 = *I believe that I would very much dislike spending time with this person*, 7 = *I believe that I would very much enjoy spending time with this person*). These 4 items were averaged into a liking index (α =.89).

Content of Self-Disclosure. Six items were included to create an index of self-reported increases in self-disclosure, according to self-penetration theory. As previously mentioned, successful self-disclosures usually entail a discussion of a breadth of topics ("I feel like my conversation partner and I discussed a lot of different topics") and depth of topics ("My conversation partner and I discussed a few topics in depth"). This self-disclosure procedure is fairly typical, which means that most people share self-relevant information in this manner ("I often engage in conversations similar to the one I just engaged in"). This gradual sharing of information allows dyads to build a knowledge base about each other ("I feel like I learned a lot about my conversation partner") and often leads to discussing more personal, intimate information ("My conversation partner and I discussed memories of personally significant life experiences"). This more personal information is typically shared with friends ("I think the majority of my friends would discuss things similar to those we discussed in this conversation"). Each of these items were measured on a seven point Likert scale (1 = *not at all*, 7 = *very much*). A factor analysis, which had sufficient sampling adequacy (KMO = .76), showed that these six items all loaded onto one factor with an eigenvalue over one. Thus, these six items were averaged into a self-disclosure index (α =.77).

Perceived Similarity. Perceived similarity to the conversation partner was calculated using two self-report items. Similarity is a construct that can be measured based on perceived similarity ("I feel very similar to my conversation partner") and degree of common ground ("I feel like I have a lot in common with my conversation partner"). Both items were measured on a

seven point Likert scale (1 = *not at all*, 7 = *very much*). These 2 items were averaged into a perceived similarity index (α = .91).

Responsiveness. Responsiveness was calculated four items. The first three items were adapted from Reis, Maniaci, Caprariello, Eastwick, and Finkel (2011). These items assess for whether the conversation partner is actually listening ("My conversation partner seemed to really listen to me"), whether they seem interested in what is being shared ("My conversation partner other seemed interested in what I am thinking and feeling"), and whether this is contributing to good rapport ("My conversation partner was on the same wavelength with me"). The fourth item is an explicit measure of responsiveness ("My conversation partner was responsive to me during the conversation"). These were measured using a seven point Likert scale (1 = *not at all*, 7 = *very much*). These 4 items were averaged into a responsiveness index (α = .67).

Ease of Processing. Five measures were designed to assess for ease of processing of self-disclosures in the getting-acquainted exercise. This includes if it was easy to share information ("It was easy to share information with my conversation partner"), easy to hear information (It was easy to understand my conversation partner"), and easy to use the platform to share information ("It was easy to talk face-to-face/text message/instant message with my conversation partner"). To ensure participants were not only paying attention and help eliminate affirmation biases (Couch & Keniston, 1960), two reverse scored items were included ("I had a hard time sharing information with my conversation partner", "I had a hard time understanding my conversation partner"). These were measured using a seven point Likert scale (1 = *not at all*, 7 = *very much*). A factor analysis, which had sufficient sampling adequacy (KMO = .72), showed that these five items all loaded onto one factor with an eigenvalue over one. These five items were averaged into an ease of processing index for time one (α = .54). Note, if the reverse

scored item "I had a hard time understanding my conversation partner" was eliminated, scale reliability increased (α =.79). However, because of the results of the factor analysis, the five items were retained in the index.

Enjoyment of the Interaction. One final index of four items was included in the questionnaire as a potential mediator because of its growing presence in the CMC literature, which is how much the dyad enjoyed their conversation (e.g., Sprecher, 2014a; 2014b). Enjoyment of interaction was assessed with four items: "How much did you enjoy the interaction?", "How much did you enjoy your role in the interaction?", "How much did you and the other laugh during the interaction?", and "How much fun was the interaction?". These items were measured using a seven point Likert scale (1 = *not at all*, 7 = *very much*). A factor analysis, which had sufficient sampling adequacy (KMO = .85), showed that these four items all loaded onto one factor with an eigenvalue over one. These four items were averaged in an index (α =.85). Note, if the items "How much did you and the other laugh during the interaction?" item was eliminated, scale reliability increased (α =.92). However, because of the results of the factor analysis, the four of items were retained in the index.

Results

Participant responses to the aforementioned variables in the questionnaire were analyzed using IBM Statistical Package for the Social Sciences (SPSS). Sample sizes across conditions were close but not exact: FtF (n = 36), text messaging (n = 35), instant message (n = 31). Nineteen participants reported suspicion about the experiment, leaving 74 people not suspicious and 9 with no response. Of the 19 who reported they were suspicious about the experiment, only four reported suspicion that they were actually talking to someone who worked in the lab.

Participant responses were analyzed in a six step process. First, factor analyses were conducted on variable indexes that were not well established by prior research (e.g., ease of processing). This was done to ensure the individual items were measuring the same intended construct. Second, reliability analyses were conducted on all of the variables in each of the proposed indexes. If reliability was sufficient, the variables were averaged into indexes, as reported above. Third, two-factor ANOVAs examined the effect of the platform type (FtF, instant messaging with a photo, and text messaging) and gender (male, female) on the manipulation check item and quality of the conversation items. This was done to see if participants picked up the visual cue manipulation, as well as to determine any deviances across conditions (e.g., mood effects, differences in positivity of information shared, etc.). Fourth, two-factor ANOVAs examined the effect of the platform type (FtF, instant messaging, and text messaging) and gender (male, female) on interpersonal outcomes (liking, closeness). This was done to test the first proposed hypothesis. Fifth, two-factor ANOVAs examined the effect of the platform type (FtF, instant messaging, and text messaging) and gender (male, female) on the four proposed mediators (responsiveness, similarity, ease of processing, enjoyment of the interaction. This set of analyses did not have any associated hypotheses because it was decided upon post hoc. Seeing how the mediators differed across platforms could produce meaningful data, in addition to the planned analyses of testing the mediator's relationship with self-disclosures across the three platforms. Sixth, mediation analyses were conducted to examine the four proposed mediators (i.e., responsiveness, similarity, ease of processing, enjoyment of the interaction) between self-disclosure and interpersonal outcomes. This was done to test the last three hypotheses.

Across all the ANOVA tests, no significant effects involving gender were found, *F*s < 1.13, *p*s > .299. [2] Despite the unevenness of gender across the platform types, results were not different whether gender was kept in the analyses or not; therefore, all following analyses reported included both platform type and gender as fixed factors.

Manipulation Check. As expected, there was an effect of platform type on the manipulation check item "I learned a lot about my conversation partner from their appearance," F (2, 96) = 3.28, p = .042, η^2_p = .06. Pairwise comparisons[3] showed that participants in the FtF condition (M = 2.97, SE = .25) felt as though they learned more about their conversation partners based on their appearance than either the (M = 2.02, SE = .26) conditions, p = .038, d = .39, or text-messaging conditions (M = 2.15, SE = 2.16), p = .015, d = .61. Unexpectedly, instant-messaging with a photo had the lowest ratings, but was not significantly different from the text-messaging condition, p = .768.

Quality of conversation. There was no effect of platform type on perceived positivity of the conversation, F (2, 96) < 1.00, p = .897. All conversations across FtF (M = 6.50, SE = .16), instant-messaging (M = 6.37, SE = .22), and text-messaging conditions (M = 6.46, SE =.17) were rated as highly positive.

There was also no effect of platform type on discomfort with the information their conversation partner shared, F (2, 96) < 1.00, p = .834. Participants across FtF (M = 2.13, SE = .35), instant-messaging (M = 1.78, SE = .50), text-messaging conditions (M = 2.08, SE =.38) were comfortable with the self-disclosures.

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[2] Random assignment for gender across conditions failed. Females were fairly evenly distributed: FtF (n = 21), Text (n = 24), IM (n = 26). However, males were underrepresented in the IM condition: FtF (n = 15), Text (n = 11), IM (n = 5).

[3] Since the sample sizes across conditions were slightly different, pairwise comparisons used Gabriel's procedure as the post hoc test (Field, 2013).

There were also no significant effects from any of the items in the PANAS across platform type, *F*s < 1.00, *p*s > .313.

Effect of platform on interpersonal outcomes. To address the first hypothesis in this study, ANOVAs were used to test the effect of FtF and CMC platforms on both closeness and liking.

There was an effect of platform type on closeness, F (2, 96) = 5.79, p =.004, η^2_p = .19 (see Table 1). Pairwise comparisons show that participants in the FtF condition (M = 3.75, SE = .17) felt closer to their conversation partner than participants in the instant-messaging (M = 2.81, SE = .25), p = .003, d = .69, or text-messaging conditions (M = 3.12, SE = .19), p = .014, d = .63. The text-messaging and instant-messaging groups were not significantly different, p = .325.

There was no effect of platform type on liking, F (2, 96) = 2.031, p = .137 (see Table 1). However, participants liked (M = 5.37, SEM = .11) their conversations partners to a greater degree than they felt close to them, (M = 3.24, SE = .11), t (101) = -21.21, p < .001, d = -2.10 (see Figure 1).

Effect of platform on additional indexes. Once again, no hypotheses were specifically made about this set of analyses because they were decided on post hoc. Seeing how the other collected indexes differed across platforms could produce meaningful data. Just as with differences in quality of the conversation, differences amongst the proposed mediators could help explain differences in closeness and liking. Additionally, these analyses could be helpful in interpreting the planned analyses of testing the mediators in the relationship between self-disclosure and both closeness and liking.

Perceived self-disclosure. There was an effect of platform type on perceived self-disclosure, F (2, 96) = 6.84, p = .002, η^2_p = .13. Pairwise comparisons show that those in the FtF

condition (*M* = 5.43, *SE* = .17) felt they and their conversation partners self-disclosed significantly more than in the instant-messaging (*M* = 4.42, *SE* = .25), *p* = .004, *d* = .79, or text-messaging conditions (*M* = 4.46, *SE* = .19), *p* < .001, *d* = .97. The text- and instant-messaging conditions were not significantly different, *p* = .840.

Responsiveness. There was an effect of platform type on responsiveness, *F* (2, 96) = 9.26, *p* < .001, η^2_p = .16. Those in the FtF condition (*M* = 6.22, *SE* = .13) felt their conversation partners were significantly more responsive that in the instant-messaging (*M* = 5.50, *SE* = .18), *p* = .002, *d* = 0.55, or text-messaging conditions (*M* = 5.68, *SE* = .14), *p* = .004, *d* = 0.35. The text- and instant-messaging conditions were not significantly different, *p* = .441.

Similarity. There was an effect of platform type on similarity, *F* (2, 96) = 2.96, *p* = .051, η^2_p = .06. Those in the FtF condition (*M* = 4.64, *SE* = .24) felt significantly more similar to their conversation partner than in the instant-messaging (*M* = 3.64, *SE* = .35), *p* = .021, *d* = 0.35. The FtF and text-messaging (*M* = 4.11, *SE* = .26) conditions were not significantly different, *p* =.142, and neither were text- and instant-messaging, *p* = .280.

Ease of Processing. There was no effect of platform type on ease of processing, *F* (2, 96) < 1.00, *p* = .859. Those in the FtF condition (*M* =6.45, SE = .13) felt like the context was as easy to process and understand as the instant-messaging (M = 6.33, SE = .19) and text-messaging conditions (M = 6.39, SE =.14).

Enjoyment of the Interaction. There was an effect of platform type on enjoyment of the interaction, *F* (2, 96) = 9.27, *p* < .001, η^2_p = .16. Those in the FtF condition (*M* = 5.62, *SE* = .19) enjoyed their interaction significantly more than those in the instant-messaging (*M* = 4.50, *SE* = .27), *p* = .001, *d* = 0.61, or text-messaging conditions (*M* = 4.60, *SE* = .20), *p* < .001, *d* = 0.93. The texting- and instant-messaging conditions were not significantly different, *p* =.777.

Mediation analyses. The last three hypotheses in this study addressed the relationship between perceived self-disclosure and both closeness and liking, as well as potential mediators to explain both of those relationships.

Mediation occurs when a relationship between a predictor variable and outcome variable can be explained by a third variable (i.e., mediator; Field, 2013). To test for mediation, three assumptions have to be met (Baron & Kenny, 1986). First, there needs to be a relationship between the predictor variable and outcomes variables without the mediator present (pathway c). Second, the predictor variable must have a significant relationship with the proposed mediator (pathway a). Third, the proposed mediator must have a significant relationship with the outcome variable (pathway b). Pathway a and b explore the indirect effect of the predictor variable on the outcome variable through the mediator (pathway c'). If all three assumptions are met, then the direct effect of the predictor variable on the outcome variable (pathway c) can be compared to the indirect effect (pathway c'). Mediation is said to have occurred if the effect of pathway c' is smaller than pathway c, and preferably if pathway c' is no longer significant with the addition of the mediator (Baron & Kenny, 1986; Field, 2013).

To address the last two proposed hypotheses, the four proposed mediators (i.e., responsiveness, similarity, ease of processing, and enjoyment of the interaction) were examined in both the relationship between self-disclosure and closeness as well as self-disclosure and liking. Each of the proposed mediators were tested in four steps, based on the aforementioned assumptions, using PROCESS in SPSS. If the mediators failed at any of the following steps, they were eliminated from subsequent analyses. Step one, the direct effect of self-disclosure on both liking and closeness was tested (pathway c). Step two, the relationship of self-disclosure on

each of the proposed mediators was tested (pathway a)[4]. Step three, the relationship of the proposed mediators on closeness (pathway b). In each of these three steps, a significant effect was pre-determined at the $p = .05$ level. If any of the tested relationships had a significant level greater than this cut-off, they were eliminated from subsequent analyses. If mediators passed the assumption in pathway a and pathway b, then a full mediation analysis was conducted[5].

Pathway c. Regressions were used to examine the relationship between self-disclosure and both closeness and liking (see Table 2). Increases in perceived self-disclosure across all three platforms (FtF, text messaging, instant messaging) significantly predicted increases in both liking and closeness. Thus all direct effect relationships met the first criteria and moved on to the next test.

Pathway a. Regressions were also used to examine the relationship between self-disclosure and each of the four mediators (see Table 3). All of the proposed mediators were significantly predicted by perceived self-disclosure. Across all three platforms, increases in perceived self-disclosure predicted increased responsiveness, similarity, ease of processing, and enjoyment of the interaction. Since they all passed this assumption, all mediators moved onto step three.

Pathway b. Simultaneous regressions were used to examine the relationship between each of the mediators on the outcome variables of closeness and liking (see table 4). Mediators that are significant predictors at this step will qualify for a full mediation analysis. Using

[4] All four mediators were run simultaneously for pathway a and pathway b to test the effect of the mediators independent of each other. Mediators were deemed conceptually distinct (Kenny et al., 1998) based on lack of multicollinearity issues (Tolerance > .46, VIF < 56) and the variables were not too highly correlated ($r < .611$).

[5] Since PROCESS only produces a Sobel test with one mediator, any potential mediators that make it to the final step were run individually for the final mediation test.

closeness at the outcome variable, only responsiveness and enjoyment of the interaction were significant predictors. Increases in both responsiveness and enjoyment of the interaction significantly predicted increases in closeness. Using liking as the outcome variable, only responsiveness and similarity were significant predictors. Increases in both responsiveness and similarity significantly predicted increases in liking. Thus, there were four final mediation analyses conducted: two for self-disclosure and closeness and two for self-disclosure and liking.

Mediation Analysis. Four full mediation analyses were run in PROCESS after testing both pathway c, a, and b. First, a mediation analysis was run using similarity as a mediator of closeness regressed on self-disclosure (see Figure 2). There was a significant indirect effect of self-disclosure on closeness through similarity, $b = .25$, $z = 4.07$, $p < .001$, BCa CI [.16, .38]. The indirect effect when enjoyment of the interaction was mediating the model (pathway c') decreased from the direct effect but was still significant (Baron & Kenny, 1986). This is a relatively large effect, $\kappa^2 = .27$, BCa CI [.17, .37]. Increases in self-disclosure predicted increases in perceived similarity, which in turn predicted increases in closeness.

Second, a mediation analysis was run using enjoyment of the interaction as a mediator of closeness regressed on self-disclosure (see Figure 3). There was a significant indirect effect of self-disclosure on closeness through enjoyment of the interaction similarity, $b = .234$, $z = 3.43$, $p < .001$, BCa CI [.13, .37]. The indirect effect when enjoyment of the interaction was mediating the model (pathway c') decreased from the direct effect but was still significant (Baron & Kenny, 1986). This is a relatively large effect, $\kappa^2 = .23$, BCa CI [.13, .34]. Increases in self-disclosure predicted increases in enjoyment of the interaction, which in turn predicted increases in closeness.

Third, a mediation analysis was run using responsiveness as a mediator of liking regressed on self-disclosure (see Figure 4). There was a significant indirect effect of self-disclosure on liking through responsiveness, $b = .24$, $z = 3.35$, $p < .001$, BCa CI [.11, .40]. The indirect effect when responsiveness was mediating the model (pathway c') decreased from the direct effect but was still significant (Baron & Kenny, 1986). This is a relatively large effect, $\kappa^2 = .21$, BCa CI [.10, .33]. Increases in self-disclosure predicted increases in responsiveness, which in turn predicted increases in liking.

Fourth, a mediation analysis was run using similarity as a mediator of liking regressed on self-disclosure (see Figure 5). There was a significant indirect effect of self-disclosure on liking through similarity, $b = .23$, $z = 3.37$, $p < .001$, BCa CI [.11, .39]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect (pathway c) but was still significant (Baron & Kenny, 1986). This is a relatively large effect, $\kappa^2 = .22$, BCa CI [.10, .35]. Increases in self-disclosure predicted increases in perceived similarity, which in turn predicted increases in liking.

Discussion

Study 1 was a self-disclosure controlled study designed to 1) compare the effects of self-disclosing on FtF and CMC platforms on positive interpersonal outcomes of closeness and liking and 2) further explore potential mediators between self-disclosure and both closeness and liking. Self-disclosures were controlled for through a structured getting-acquainted exercise and confederates. This control should isolate the effect of the platform type on interpersonal outcomes. Participants self-disclosed to confederates either FtF, instant messaging with a picture of their conversation partner visible on the screen, and text-messaging.

The first hypothesis posited that the FtF condition and CMC conditions would produce equivalent amounts of liking and closeness. However, this hypothesis was only partially supported. After the getting-acquainted exercise, participants liked their conversation partner equally across all three conditions. However, participants did feel closer to those in the FtF condition than either instant-messaging or text-messaging conditions. This supports previous studies that found FtF to be the superior platform at producing closeness, compared to CMC (e.g., Okdie et al., 2014). However, this does contradict the pilot data collected which found no closeness differences across FtF, text, and e-mail. A possible explanation lies in the fact that a different getting-acquainted exercise was used for Study 1 than in the pilot study. In the pilot study, the getting-acquainted exercise was less elaborate. Participants only answered a list of ten questions increasing in self-disclosure depth in five minutes. Perhaps the pilot data found no differences because it was not a sufficient amount of time or an effective self-disclosure exercise for any closeness differences to manifest. Participants in Study 1 asked and answered three lists of questions increasing in self-disclosure depth (e.g., Sprecher et al., 2013a). Participants not only felt closer to confederates in the FtF condition, but also perceived they self-disclosed more in the FtF condition, compared to the CMC conditions. Thus, participants in Study 1 felt closer to confederates in the FtF condition because they believed they self-disclosed more. In the pilot study, participants felt equally close because participants across the conditions felt they self-disclosed equally; however, no measures of perceived self-disclosure were taken in the pilot study.

This effect could be further confounded by the fact that responsiveness, similarity, and enjoyment of the interaction were rated higher in FtF platform than either CMC platform. Knowing that perceived self-disclosure was highest in the FtF platform, the fact that these three

indexes were also greater in the FtF condition is consistent with previous research. Increases in self-disclosure have been shown to result in increases in responsiveness (Laurenceau et al., 1998), similarity (Byrne, 1971; Norton et al., 2007), and enjoyment of the interaction (Sprecher et al., 2013a; 2013b). Interestingly, ease of processing was still equal across all three conditions. Even though participants perceived greater amounts of self-disclosure in the FtF condition, all conditions were highly rated as easy to use for self-disclosing. Because ease of processing was so highly rated across all three conditions, the variability in amount of self-disclosure did not impact ease of processing. Whether participants perceived that they and their conversation partner self-disclosed a lot or a little, it was still easy to process and understand the self-disclosures across the platforms.

Therefore, the primary hypothesis that self-disclosures between strangers on CMC platforms would be comparable to the FtF platform in producing positive interpersonal outcomes was not supported. Instead the FtF platform produced significantly greater closeness than the CMC platforms, though liking did not differ. Though Study 1 was designed to control for self-disclosures across conditions, this control did not work. Participants in the FtF condition perceived greater amount of self-disclosure during their getting-acquainted exercise than either the instant-messaging or text-messaging conditions. Due to this potential manipulation failure, coding of the actual getting-acquainted exercise is needed to determine whether there were actual differences in self-disclosure.

The second hypothesis posited that self-disclosures would positively predict both closeness and liking. This hypothesis was supported. Regardless of platform type, increases in perceived self-disclosure predicted increases in both closeness and liking. Finding these

significant relationships facilitated the testing of the final two hypotheses, which speculated mediators between these two relationships.

The third hypothesis posited that the relationship between self-disclosure and closeness would be mediated by responsiveness, enjoyment of the interaction, and ease of processing. Instead, similarity and enjoyment of the interaction mediated the relationship. Increases in self-disclosure predicted increases in similarity and enjoyment, which in turn predicted increases in closeness. Similarity was not predicted as a mediator because of its lack of research demonstrating its influence on closeness. However, this study supports other preliminary findings that this relationship exists (e.g., Sprecher, 2014b). As self-disclosures increase, people have more of an opportunity to find common ground (Clark, 1985), and this knowledge base allows people to find more similarity. As similarity increases, people feel as though there is more overlap between themselves and their conversation partner, producing increased feelings of closeness (Aron et al., 1992). As predicted, enjoyment of the interaction was a significant mediator. As self-disclosures increase, people enjoy the interaction more, which then increases closeness. This supports Susan Sprecher's line of research that self-disclosures influence how much people enjoy their conversations with others. The relationship between enjoyment of interaction and closeness is a new addition to that research. These positive feelings of happiness and enjoyment are present in relationships with those we are close to (Lucas & Dyrenforth 2006; Myers, 1992). Contrary to expectations, responsiveness and ease of processing did not mediate the relationship between self-disclosure and closeness. The fact that responsiveness did not mediate this relationship is in perhaps not unexpected. Self-disclosure was analyzed collapsed across conditions. However, the ability to know that someone is paying attention and cares about the information is largely derived from nonverbal cues (e.g., Berg, 1987; Miller & Berg,

1984). Because of this, responsiveness may only mediate the relationship between self-disclosure and closeness in the FtF platform because of its abundance of nonverbal cues. In fact, this proved to be the case when self-disclosure was broken up by platform type. Responsiveness was only a significant mediator with FtF self-disclosures and not CMC self-disclosures. However, the sample sizes in each condition ($n < 31$) were too small for these to be statistically power results. Finally, ease of processing was not a significant mediator. Since there were no differences in ease of processing across conditions, it could not be a mediator.

The fourth hypothesis posited that the relationship between self-disclosure and liking would be mediated by similarity, enjoyment of the interaction, and ease of processing. Instead, responsiveness and similarity were significant mediators in this relationship. Increases in self-disclosure predicted increases in responsiveness and similarity, which in turn increased liking. Responsiveness was not predicted as a mediator because of its lack of research demonstrating its influence on liking. However, this study supports other preliminary findings that this relationship exists (e.g., Rosenfeld, 1966a; 1966b). Participants who felt like their conversation partner was responsive during their conversation also liked them more. When others make us feel important and wanted, an increase in positive feelings such as liking develop towards them. As predicted, similarity was a significant predictor. Participants who perceived greater self-disclosure during conversations felt more similar to their conversation partner, and in turn liked their conversation more. This similarity-liking effect is a common finding in the social psychology literature (e.g., Byrne, 1997). Neither enjoyment of the interaction or ease of processing were significant mediators.

Study 1 was designed to test the effect of FtF and CMC platforms on positive interpersonal outcomes through a controlled environment and design. Although Study 1 has the

benefit of internal validity, it lacks generalizability. Therefore, Study 2 was designed to run concurrently with Study 1 to also test the effect of FtF and CMC platforms on positive impersonal outcomes, but in a less rigorously controlled environment.

Study 2

Once again, Study 2 was designed to 1) test the effect of FtF and CMC platform self-disclosures with strangers on positive interpersonal outcomes and 2) further investigate mediators between self-disclosure and positive interpersonal outcomes of closeness and liking. However, Study 2 did so in a more generalizable fashion, by allowing for dyads to have free form conversations to let self-disclosures flow more naturally. Additionally, no confederate was used. Instead, this study recruited two strangers that were not affiliated with the lab in anyway, once again to see how more naturalistic self-disclosures unfold. In contrast to Study 1, Study 2 also included a second interaction to test the media multiplicity theory. Both interactions were free-form conversations. The first conversation differed across FtF, text, or instant messaging, while the second conversation all dyads had FtF. Testing the theory of media multiplicity has been done, but the second interaction had dyads talk through video chat (Sprecher, 2014b). This still leaves the question of media multiplicity with FtF as the second interaction. Typically, when people form relationships online (e.g., online data), the next step is for people to meet in person (e.g., Ramirez et al., 2015).

Study 1 and Study 2 were run concurrently, and so the results from Study 1 did not influence the predictions in Study 2. Thus, the hypotheses for Study 2 are the same as from Study 1.

H1: After the first conversation, FtF will not produce significantly greater closeness or liking compared to text messaging or instant messaging,

In Study 1, the getting-acquainted exercise was designed to simulate optimal self-disclosure patterns and thus maximizing impact on positive interpersonal outcomes. The first conversation in Study 2 was a replication of Study 1, but using a free-form conversation instead of a getting-acquainted exercise. I hypothesized that positive interpersonal outcomes would be roughly equivalent across the FtF, text, and instant messaging conditions, as I did in Study 1. Self-disclosures should still happen, even without a script to guide the conversation. I expected differences after the second conversation, which leads to my second hypothesis.

H2: After the second conversation, dyads who had their first conversation on a CMC platform (text- or instant-messaging) will have significantly higher positive interpersonal outcomes than the FtF condition due to media multiplicity.

After the second conversation, I expected closeness and liking to be higher for dyads that had their first conversation on a CMC platform, compared to the FtF platform. According to the media multiplicity theory, combining platforms are more effective for producing interpersonal outcomes than one platform alone, which is also preliminarily supported by the pilot study and literature (Sprecher, 2014b). In the FtF condition, dyads had two free-form conversations using the FtF platform. In the CMC conditions, dyads had one free-form conversation over text or instant messaging with the second conversation being FtF. If the media multiplicity theory holds up, then I expected the combination conditions to have the greatest closeness and liking.

In addition to testing for the effect of self-disclosures across different platform types on closeness and liking, this study also collected measures to test for potential mediators in the relationship between self-disclosure and closeness and liking. Little research has investigated potential mediators between self-disclosure and both closeness and liking, and no studies have tested said mediators simultaneously to test their unique effects. Therefore, just as in Study 1, I expect the following hypotheses after both conversation:

H3: Increases in perceived self-disclosure will positively predict both closeness and liking.

H4: In the self-disclosure and closeness relationship, responsiveness, enjoyment of the interaction, and ease of processing will be significant mediators.

H5: In the self-disclosure and liking relationship, similarity, enjoyment of the interaction, and ease of processing would be significant mediators.

Method

Participants. One hundred and eighty-four University of Arkansas undergraduate students, or 92 dyads, participated in exchange for partial fulfillment of their General Psychology course credit. Students were recruited to participant in a study about how people have conversations with strangers. The only pre-requisites will be that they must 18 years or older.

Four dyads had to be eliminated from the sample because they had a previous acquaintance with each other before participating in the study together or did not complete the questionnaire. This left 88 dyads for the final analysis. The students averaged 19.36 years of age (*SE* = .44), were mostly female (73.6%), and ethnically identified as 68% White/Caucasian,

5.1% Black/African-American, 5.1% Asian/Asian-American, 7.3% Hispanic/Latino, 1.7% Native American, and 12.9% Biracial (i.e., identifying as two races).

Procedure. Participants were recruited through the SONA research participation portal, under the description that this study was investigating how people have conversations with strangers. Each time slot had two participant slots to allow for dyad recruiting, and they were asked to not sign up with anyone they had a prior acquaintance with.

Participants were met in the experimental waiting area of the psychology building. The experimenter brought the two participants back to the lab room. Participants completed the informed consent, during which they were told they would be having two brief, informal conversations together and filling out a questionnaire after each conversation.

Dyads were randomly assigned to have their first conversation on one of three platforms: FtF, instant messaging with a photo, or text-messaging. All conditions were told that they would be having a brief conversation together and if they couldn't think of something to discuss, they could talk about things they liked to do for fun. However, their conversation would be recorded and so not to discuss anything sensitive, embarrassing, or that involved criminal behavior. In the FtF condition, the experimenter turned on a video camera to record the conversation and the dyad was left in the lab room to talk for five minutes. In the text-messaging condition, the dyad was separated into two rooms and both participants were provided a smart phone (Virgin Mobile LG Tribute LS660). They were left in their rooms to have a conversation for ten minutes. In the instant messaging condition, the dyad was separated into two rooms and provided with a computer (Dell desktop). The experimenter then helped the participant take a picture of themselves using a provided webcam and upload it to G-chat, an instant-messaging function

through G-mail. Like the text-messaging condition, the dyad was left in their separate rooms to chat for ten minutes.

After this first conversation, participants separately filled out a questionnaire with all of the measures listed below. Those in the text-messaging and instant-messaging conditions stayed in their separate rooms. In the FtF condition, the participant closest to the door filled out their questionnaire at a table in the hallway while the other participant stayed in the room. After completing the questionnaire, both participants were brought into the same lab room for the second conversation.

For the second conversation, all dyads conversed FtF. They were reminded once again that their conversations would be video and audio recorded. The experimenter turned on the camera and left the dyad in the lab room to talk for five minutes. After this second conversation, participants filled out a questionnaire identical to the first questionnaire. It additionally asked whether the dyad knew each other prior to this interaction and basic demographic information. The participant closest to the door filled out their questionnaire at a table in the hallway while the other participant stayed in the room. After completing the questionnaire, both participants were brought into the lab room and debriefed about the study.

After the participants left, the experimenter saved the text-message conversations and instant-message conversations and deleted them to ensure other participants did not see previous conversations.

Measures. The same measures from Study 1 were again used in Study 2. The questionnaires were identical after the first and second conversation except the second questionnaire asked for basic demographic information (see Appendix C).

Closeness index. These 10 items, 5 from each participant, were averaged into a closeness index for time one (α = .73) and for time two (α =.78).

Liking. These 8 items, 4 from each participant, were averaged into a liking index for time one (α = .82) and for time two (α =.86).

Self-Disclosure. Given the different context of the self-disclosure, four factor analyses were run for this index, once each participant after both conversations. Both had sufficient sampling adequacy, (KMO > .595). For each analysis, all variables except "I often engage in conversations similar to the one I just engaged in" loaded onto one factor with an eigenvalue over one. Thus, the other five items were averaged into a self-disclosure index. These 10 items, 5 from each participant, were averaged into a self-disclosure index for time 1 (α =.71) and time two (α =.69).

Responsiveness. These 8 items, 4 from each participant, were averaged into responsiveness index for time one (α = .70) and for time two (α =.79).

Perceived Similarity. These 4 items, 2 from each participant, were averaged into a perceived similarity index for time one (α = .78) and for time two (α =.71).

Ease of Processing. Once again, given the different context of the self-disclosure, four factor analyses were run for this index, once each participant after both conversations. Both had sufficient sampling adequacy, (KMO > .637). All variables except "I often engage in conversations similar to the one I just engaged in" loaded onto one factor with an eigenvalue over one. These 10 items, 5 from each participant, were averaged into an ease of processing index for time one (α = .69) and for time two (α =.64).

Additional variables. Enjoyment of interaction: eight items, 4 from each participant, were averaged into an enjoyment index for time 1 (α =.55) and time two (α =.88). I again

included the manipulation check ("I learned a lot about my conversation partner based on their appearance"). Positivity of the information, comfort with the information shared, abbreviated PANAS, and basic demographics.

Results

Dyads responses to the aforementioned variables, and their indexes, were analyzed using IBM SPSS. Sample sizes across conditions were close but not equal: FtF (n = 31), text messaging (n = 32), instant message (n = 25). The dyad was the unit of analysis for Study 2. Closeness and liking were examined within the dyad, not from individual participants. Thus, only variables collected from both participants were used. Although MLM is becoming the reporting standard for dyadic data analysis (Kenny, Kashy, & Cook, 2006), our lab has compared MLM and ANOVA analyses using similar research design and found no differences (Beike, Brandon, & Cole, 2015). Therefore, the data was analyzed using ANOVAs, regressions, and mediation in indexes averaged from both participants.

Dyadic responses were analyzed in a six step process, similar to Study 1. First, factor analyses were conducted on variable indexes that were not well established by prior research (e.g., ease of processing). This was done to ensure the individual items were measuring the same intended construct. Second, reliability analyses were conducted on all of the variables in each of the proposed indexes. If reliability was sufficient, the variables were averaged into indexes, as reported above. Third, mixed-model ANOVAs were used to examine the manipulation check item and quality of the conversations. These ANOVAs were based on a 2 (Conversation: First versus Second) x 3 (Platform type: FtF, Text, IM) factorial design. Fifth, ANOVAs examined the effect of the platform type (FtF, instant messaging, and text messaging) on the four proposed mediators (responsiveness, similarity, ease of processing, enjoyment of the interaction. Sixth,

mediation analyses were conducted to examine potential explanatory variable between self-disclosure and interpersonal outcomes. This was done to test the last three hypotheses, for both conversations.

Across all the ANOVA tests, no significant effects involving gender dyads were found, *F*s < 1.00, *p*s > .448.[6] Leaving the gender match of the dyad in did not change the significant of the results; however, because of the vast sample size disparity in gender dyads, the gender factor was left out of the subsequent analyses.

Manipulation Check. There was a marginal main effect of platform type on how much dyads thought they learned about their conversation partner based on their appearance, F (2, 85) = 3.01, p = .055, η^2_p = .07. Dyads in the FtF condition (M = 3.24, SE = .20) thought they learned a lot about their conversation partner from their appearance than the text-messaging condition (M = 2.60, SE =.20), p =.028, or the IM condition (M = 2.65, SE = .23), p = .055. Dyads did not learn significantly more in the IM condition than the text-messaging condition, p = .873. There was also a main effect of conversation on appearance, F (1, 85) = 17.89, p < .001, η^2_p = .17. Dyads learned more about each based on their appearance during the second conversation (M = 3.08, SE = .15) than the first (M = 2.58, SE = .12). This makes sense as the second conversation across all dyads was FtF, whereas the first was FtF, texting, or IM. Finally, there was an interaction of platform type and conversation on appearance, F (2, 85) = 4. 62, p = .012, η^2_p = .10. After the first conversation, FtF (M = 3.24, SE = .21) learned significantly more about their conversation partner based on appearance than the text (M = 2.25, SE = .20) or IM (M = 2.26, SE = .23) conditions, ps < .006. After the second conversation, dyads learned equal amount of

[6] Gender dyads were unbalanced: Male-Male (n = 5), Female-Female (n = 45), and Male-Female (n = 38). Results do not change if male-male pairing is eliminated from the sample.

information amount their conversation partner from their appearance across the FtF (M = 3.24, SE = .24), text (M = 2.95, SE = .24), or IM conditions (M = 3.03, SE = .27), ps > .783. There was no difference from conversation 1 to conversation 2 in the FtF condition, p = 1.00. There was a significant increase from conversation 1 to conversation 2 in the text condition, p < .001, d = -.63, and IM condition, p = .003, d = -.69.

Additional variables about quality of conversation. There was no main effect of platform type on positivity, F (2, 85) < 1.00, p = .397, as positivity ratings were high in the FtF (M = 6.39, SE = .12), text-messaging (M = 6.42, SE = .11), and instant-messaging conditions (M = 6.20, SE = .13). There was a marginal main effect of conversation, F (1, 85) = 3.82, p = .050, η^2_p = .04, in which dyads rated their second conversation (M = 6.41, SE = .07) as more positive than their first conversation (M = 6.26, SE = .09). There was no interaction of platform type and conversation on positivity, F (2, 85) < 1.00, p = .522.

There were no main effects or interaction of platform type and conversation on how uncomfortable the dyads were with the information Fs < 1.65, ps > .200. Overall, the dyads were comfortable with their conversations (M = 1.73, SE = .09).

There were also no significant effects from any of the variables in the PANAS across platform type, Fs < 1.30, ps > .250.

Effect of platform on interpersonal outcomes. There was no main effect of the between-subject variable of platform type on closeness, F (2, 85) = 1.31, p = .276, with ratings of closeness equal across the FtF condition (M = 3.27, SE = .12), text messaging (M = 3.01, SE = .12) or IM conditions (M = 3.08, SE = .14).

There was a main effect of the timing of the conversation on closeness, F (1, 85) = 204.379, p < .001, η^2_p = .71. Dyads felt significantly closer after their second conversation (M =

3.55, *SE* = .09) than after their first conversation (*M* = 2.69, *SE* = .07). FtF increased in closeness from time 1 to time 2, *t* (30) = -3.46, *p* = .002, *d* = .63. Text increased in closeness from time 1 to time 2, *t* (31) = -12.70, *p* < .001, *d* = -2.45. IM increased in closeness from time 1 to time 2, *t* (24) = -8.81, *p* < .001, *d* = -1.79.

There was an interaction of timing of the conversation by platform on closeness, *F* (2, 85) = 18.74, *p* < .001, η^2_p =.31 (see Table 5). Pairwise comparisons of platform type on closeness after the first conversation showed that dyads in the FtF condition felt significantly closer than in the text messaging or instant messaging conditions, *p*s < .002; the text-messaging conditions were not significantly different, *p* = .606. After the second conversation, dyads felt equally close across all three platforms, *p*s > .406 (see Figure 6).

There was no main effect of platform type on liking, *F* (2, 85) = 1.59, *p* = .211, so that the FtF condition (*M* = 5.23, *SE* = .15) and text messaging (*M* = 5.13, *SE* = .15) conditions elicited only slightly higher liking than the IM condition (*M* = 4.83, *SE* = .17).

There was a main effect of timing of the conversation on liking, *F* (1, 85) = 27.14, *p* < .001, η^2_p = .24. Dyads liked their conversation partner more after the second conversation (*M* = 5.22, *SE* = .10) than after their first conversation (*M* = 4.90, *SE* = .09), *p* < .001.

There was an interaction of timing of the conversation by platform on liking, *F* (2, 85) = 5.98, *p* = .004, η^2_p =.12 (see Table 5). Pairwise comparisons of platform type on liking after the first conversation showed that dyads in the FtF condition liked their conversation partner more than in the instant messaging condition, *p* = .005; however, FtF was not significantly different than the text-messaging condition, *p* = .135, and the text-messaging condition was not significantly different from the IM condition, *p* = .147. After the second conversation, dyads liked each other equally across all three platforms, *p*s > .300 (see Figure 7). Liking in the FtF

condition did not increase from conversation 1 to conversation 2, t (30) = -.26, p = .798. Liking did increase in the text messaging condition from conversation 2 to conversation 2, t (31) = -4.61, p < .001, d = -.84. IM increased in liking from time 1 to time 2, t (24) = -3.76, p < .001, d = -.77.

Effect of platform on additional indexes. Once again, no hypotheses were specifically made about this set of analyses because they were decided on post hoc.

Perceived self-disclosure. There was no effect of platform type on perceived amount of self-disclosure, F (2, 85) = 2.16, p =.121. Dyads in the FtF condition (M = 4.49, SE = .13) perceived about the same amount of self-disclosure in their conversations as the instant-messaging (M = 4.23, SE =.14) and text-messaging conditions (M = 4.13, SE =.14). There was an effect of timing of the conversation on perceived self-disclosure, F (1, 85) = 129.72, p < .001, η^2_p = .61. Dyads perceived a greater amount of self-disclosure during the second conversation (M = 4.71, SE =.09) than the first conversation (M = 3.86, SE = .08). Finally, there was an interaction of platform type and timing of the conversation on perceived self-disclosure, F (2, 85) = 36.95, p < .001, η^2_p = .47. Dyads in the FtF condition (M = 4.53, SE = .13) perceived a greater amount of self-disclosure in their conversations than the instant-messaging (M = 3.66, SE = .15), p < .001, d = 1.16, or text-messaging conditions (M = 3.42, SE = .13), p < .001, d = 1.46. The text-messaging and instant-messaging conditions were not significantly different from each other, p = .55. There was no difference in perceived self-disclosures after the second conversation, ps > .19. Dyads in the FtF condition did not perceive greater self-disclosures from the first conversation to the second conversation, t (30) = .14, p =.89. However, greater perceived self-disclosure from the first conversation to the second conversation was seen in

dyads in the text messaging condition, t (31) = -11.18, $p < .001$, d = - 2.03, and the instant messaging condition, t (24) = -10.91, $p < .001$, d = - 2.24.

Responsiveness. There was no effect of platform type on responsiveness, F (2, 85) < 1.00, p =.880. Perceived responsiveness within the dyad was equal across the FtF condition (M = 5.78, SE = .13), text-messaging (M = 5.79, SE = .13), or instant-messaging (M = 5.70, SE = .14) conditions. There was a main effect of timing of the conversation on responsiveness, F (1, 85) = 5.96, p = .017, η^2_p = .07. Greater responsiveness was perceived within the second conversation (M = 5.84, SE = .09) than the first conversation (M = 5.68, SE = .07). There was an interaction of platform type and timing of the conversation on responsiveness, F (2, 85) = 6.37, p = .003, η^2_p = .13. There was no difference in responsiveness platform type at time 1, ps > .160. There was no difference in responsiveness across platform type at time 2, ps > .233. Dyads in the FtF condition did not perceive greater responsiveness from time 1 to time 2, t (30) = 1.60, p =.120. However, greater perceived responsiveness from time 1 to time 2 was seen in dyads in the text messaging condition, t (31) = -2.85, p = .008, d = - 0.51, and the instant messaging condition, t (24) = -2.61, p = .015, d = - 0.52.

Similarity. There was no effect of platform type on similarity, F (2, 85) < 1.00, p = .954. Similarity was roughly equal across the FtF condition (M = 4.18, SE = .19), text (M = 4.22, SE = .18), or instant messaging (M = 4.13, SE = .21) conditions. There was a main effect of timing of the conversation on similarity, F (1, 85) = 31.93, $p < .001$, η^2_p = .27. Dyads perceived greater similarity after the second conversation (M = 4.44, SE = .12) than after the first conversation (M = 3.91, SE = .12), $p < .001$. There was an interaction of platform type and timing of the conversation on similarity, F (1, 85) = 6.68, p = .002, η^2_p = .14. There was no difference in similarity across platform type at time 1, ps > .205. There was no difference in similarity across

platform type at time 2, *p*s > .124. Dyads in the FtF condition did not perceive greater similarity from time 1 to time 2, t (30) = -.680, p =.502. However, greater perceived similarity from time 1 to time 2 was seen in dyads in the text messaging condition, t (31) = -5.45, $p < .001$, d = - 0.97, and the instant messaging condition, t (24) = -3.28, p = .003, d = - 0.656.

Ease of Processing. There was no effect of platform type on the ease of processing index, F (2, 85) < 1.00, p =.768. There was an effect of timing of conversation, F (1, 85) = 6.02, p =.016, η^2_p = .07. Dyads thought the conversations at time 1 (M = 6.32, SE=.06) were easier to process and understand than at time 2 (M= 6.21, SE = .06), p =.016. There was no interaction of platform type and timing of the conversation on ease of processing, F (2, 85) < 1.00, p = .678.

Enjoyment of the Interaction. There was an effect of platform type on how much dyads enjoyed their interaction, F (2, 85) = 6.73, p = .002, η^2_p = .14. Dyads in the FtF condition (M = 5.23, SE = .18) enjoyed their conversation significantly more than the text (M = 4.51, SE = .17) or instant messaging (M = 4.35, SE =.20) conditions, *p*s < .005. The text- and instant-messaging conditions were not significantly different, p = .535. There was an effect of timing of the conversation on enjoyment of the interaction, F (1, 85) = 60.85, $p < .001$, η^2_p = .42. Dyads enjoyed their conversation significantly more after the second conversation (M = 5.13, SE =.12) than after the first conversation (M = 4.27, SE = .12), $p < .001$. There was an interaction of platform type and timing of the conversation on enjoyment of the interaction, F (2, 85) = 11.69, $p < .001$, η^2_p = .22. After the first conversation, FtF dyads enjoyed their conversations significantly more (M = 5.15, SE =.20) than the text- (M = 3.82, SE = .19) or instant-messaging (M = 3,84, SE = .22) conditions, *p*s < .001. After the second conversation, enjoyment of the interaction did not significantly differ across FtF (M = 5.31, SE =.20), text (M = 5.20, SE = .20), or instant messaging conditions (M = 4.87, SE =.22), *p*s > .140. Enjoyment did not differ in the

FtF condition from time 1 to time 2, t (30) = -.666, p = .510. Enjoyment did differ from time 1 to time 2 across the text, t (31) = -9.50, $p < .001$, d = - 1.74, and instant messaging conditions, t (24) = -6.779, $p < .001$, d = -1.39.

Mediation analyses. The last three hypotheses in this study addressed the relationship between perceived self-disclosure and both closeness and liking, as well as potential mediators to explain both of those relationships. Mediation was tested using the same pathway criteria as Study 1, for both the first conversation and the second conversation.

After First Conversation.

Path c. Regressions were used to examine the relationship between self-disclosure and both closeness and liking, after the first conversation (see Table 7). Increases in perceived self-disclosure collapsed across all three platform types (FtF, text messaging, instant messaging) significantly predicted increases in both liking and closeness. Thus all direct effect relationships met the first criteria and moved on to the next test.

Path a. Regressions were used to examine the relationship between self-disclosure and each of the four mediators, after the first conversation (see Table 8). Increases in perceived self-disclosure predicted increased responsiveness, similarity, ease of processing, and enjoyment of the interaction. Therefore, all mediators move on to the next step.

Pathway b. Simultaneous regressions were used to examine the relationship between each of the mediators and both closeness and liking (see table 9). Mediators that are significant predictors at this step will qualify for a full mediation analysis. Using closeness as the outcome variable, only similarity was a significant predictor. Using liking as the outcome variable, both similarity and enjoyment were significant predictors.

Mediation Analysis. Using PROCESS (Hayes, 2013), the relationship between self-disclosure and closeness was mediated by similarity (see Figure 8). There was a significant indirect effect of self-disclosure on closeness through similarity, $b = .112$, $z = 2.474$, $p = .013$, BCa CI [.030, .209]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect but was still significant (Baron & Kenny, 1986). This is a relatively medium effect, $\kappa^2 = .158$, BCa CI [.044, .284]. Increased self-disclosure within conversations predicted increased similarity, which then predicted increased closeness.

A mediation analysis examined similarity as a mediator of self-disclosure and liking (see Figure 9). There was a significant indirect effect of self-disclosure on liking through similarity, $b = .217$, $z = 3.38$, $p < .001$, BCa CI [.097, .354]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect but was still significant. This is a relatively large effect, $\kappa^2 = .225$, BCa CI [.102, .347]. Increased self-disclosure within conversations predicted increased in similarity, which then predicted increased liking.

A mediation analysis examined enjoyment of the interaction mediator of self-disclosure and liking (see Figure 10). There was a significant indirect effect of self-disclosure on liking through enjoyment of the interaction, $b = .144$, $z = 2.739$, $p = .006$, BCa CI [.045, .427]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect but was still significant. This is a relatively medium effect, $\kappa^2 = .159$, BCa CI [.053, .391]. Increased self-disclosure within conversations predicted increased enjoyment of the interaction, which then predicted increased liking.

After Second Conversation.

Path c. Regressions were used to examine the relationship between self-disclosure and both closeness and liking, after the second conversation (see Table 7). Increases in perceived

self-disclosure collapsed across all three platforms (FtF, text messaging, instant messaging) significantly predicted increases in both liking and closeness. Thus all direct effect relationships met the first criteria and moved on to the next test.

Path a. Regressions were used to examine the relationship between self-disclosure and each of the four mediators, after the second conversation (see Table 8). Increases in perceived self-disclosure predicted increased responsiveness, similarity, ease of processing, and enjoyment of the interaction. Therefore, all mediators move on to the next step.

Pathway b. Simultaneous regressions were used to examine the relationship between each of the mediators and both closeness and liking (see table 10). Mediators that are significant predictors at this step will qualify for a full mediation analysis. Using closeness as the outcome variable, only similarity was a significant predictor. Using liking as the outcome variable, both similarity and enjoyment were significant predictors.

Mediation Analysis. Using PROCESS (Hayes, 2013), the relationship between self-disclosure and closeness was mediated by similarity (see Figure 11). There was a significant indirect effect of self-disclosure on closeness through similarity, $b = .193$, $z = 3.04$, $p = .003$, BCa CI [.089, .342]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect but was still significant (Baron & Kenny, 1986). This is a relatively large effect, $\kappa^2 = .205$, BCa CI [.105, .333]. Increased self-disclosure within conversations predicted increased similarity, which then predicted increased closeness.

A mediation analysis examined similarity as a mediator of self-disclosure and liking (see Figure 12). There was a significant indirect effect of self-disclosure on liking through similarity, $b = .378$, $z = 4.236$, $p < .001$, BCa CI [.216, .584]. The indirect effect when similarity was mediating the model (pathway c') decreased from the direct effect and is no longer significant.

This is a relatively large effect, $\kappa^2 = .309$, BCa CI [.184, .427]. Increased self-disclosure within conversations predicted increased in similarity, which then predicted increased liking.

A mediation analysis examined enjoyment of the interaction mediator of self-disclosure and liking (see Figure 13). There was a significant indirect effect of self-disclosure on liking through enjoyment of the interaction, $b = .513$, $z = 5.320$, $p < .001$, BCa CI [.349, .720]. The indirect effect when enjoyment of the interaction was mediating the model (pathway c') decreased from the direct effect and is no longer significant. This is a relatively large effect, $\kappa^2 = .433$, BCa CI [.334, .554]. Increased self-disclosure within conversations predicted increased enjoyment of the interaction, which then predicted increased liking.

Discussion

In contrast to the control of Study 1, Study 2 was a less controlled, more naturalistic study with the goals of 1) testing the effects of self-disclosing on CMC platforms on positive interpersonal outcomes closeness and liking, compared to the FtF platform, and 2) further exploring potential mediators between self-disclosure and both closeness and liking. Zero-acquaintance dyads had two free-form conversations together, rather than a conversation guided by a getting-acquainted exercise. The addition of the second conversation in Study 2 was included for the purpose of testing the theory of media multiplicity. For the first conversation, dyads were randomly assigned to converse either FtF, instant messaging with a picture of their conversation partner visible on the screen, and text-messaging. For the second conversation, all dyads conversed FtF. Like Study 1, Study 2 examined potential mediators between self-disclosure and positive interpersonal outcomes of closeness and liking.

Across all three conditions in both conversations, dyads thought their interactions were overall positive and were comfortable with the information shared.

The first hypothesis for this study posited that the FtF condition and CMC conditions would produce equivalent amounts of liking and closeness, after the first conversation. This hypothesis was not supported by the data. Dyads that conversed on the FtF platform liked their conversation partner more than the instant-message condition, but was not significantly different than the text-messaging condition. This is a different finding that in Study 1, which found no differences in liking across conditions. Dyads could have liked each other more in the FtF condition than the IM condition due to the portrait picture in the instant message, or cues to identity. As previously mentioned, visual cues, or cues to identity, are not always beneficial and complete anonymity is preferred to half measures of nonverbal cues (e.g., preferring text-messaging to the profile picture in instant-messaging because the picture is not quite like FtF). These cues to identity have been found to be associated with greater dissatisfaction with conversations (Tanis & Postmes, 2007). This could be due to the fact cues to identity, such profile pictures, limit the amount the individual can influence the impressions others will make (Walther et al., 2001). Additionally, dyads that conversed on the FtF platform felt closer to their conversation partner than in either CMC platform. As in Study 1, this finding supports previous literature that found FtF to be the superior platform to produce closeness, compared to CMC (e.g., Okdie et al., 2014).

The second hypothesis for this study posited that after the second conversation dyads who had their first conversation on a CMC platform (text- or instant-messaging) will have significantly higher positive interpersonal outcomes than the FtF condition due to media multiplicity. Dyads across all three conditions felt equally close and liked each other equally. This is contradictory to the prediction, however this pattern follows a similar pattern to Sprecher (2014b). That study found that no matter what platform dyads had their first conversation on, the

effects leveled out after the second interaction. Although the Sprecher (2014b) dyads second interaction took place on a CMC platform (video Skype) and the present study was FtF, the same pattern of results appear. Thus, the second hypothesis was not supported by the data.

The third hypothesis posited that self-disclosures would positively predict both closeness and liking. This hypothesis was supported for both conversations. Regardless of platform type, increases in perceived self-disclosure predicted increases in both closeness and liking. Finding these significant relationships facilitated the testing of the final two hypotheses, which speculated mediators between these two relationships.

The fourth hypothesis posited that in the self-disclosure and closeness relationship, responsiveness, enjoyment of the interaction, and ease of processing will be significant mediators. For the both the first and second conversation, only similarity mediated this relationship. Once again, similarity was not predicted as a because of its lack of research demonstrating its influence on closeness. However, this study supports other preliminary findings that this relationship exists (e.g., Sprecher, 2014b).

The fifth hypothesis posited that in the self-disclosure and liking relationship, similarity, enjoyment of the interaction, and ease of processing would be significant mediators. For both the first and second conversation, only similarity and enjoyment of the interaction mediated this relationship. Increased self-disclosure predicted similarity and enjoyment of the interaction, which in turn predicted liking. Similarity was predicted in this relationship because of its established relationship with self-disclosure and liking (e.g., Byrne, 1971; Norton et al., 2007). Enjoyment of the interaction also mediated liking. As people enjoyed the interaction more, they consequently liked their conversation partner more. During these free-form conversations with a stranger, self-disclosures can get people to affectively experience enjoyment. If people

experience this feeling, it makes sense this with produce other positive affective feelings, such as liking. More specific theories regarding why enjoyment of the interaction influences liking need to be developed.

General Discussion

Two studies were designed and run concurrently to 1) compare the effect of FtF and CMC platform self-disclosures on positive interpersonal outcomes in zero-acquaintance situations and 2) investigate mediators between self-disclosure and positive interpersonal outcomes of closeness and liking. The FtF and CMC platforms have been compared before on their ability to produce closeness and liking (e.g., Sprecher, 2014b; Okdie et al., 2011). While this small area of literature largely supports FtF as the superior platform for developing closeness and liking when self-disclosing (e.g., Okdie et al., 2011), this is not always a consistent finding (e.g., McKenna et al., 2002). The limited research could be producing different results due to the research design. These studies have differed by having participants engage in 1) a structured self-disclosure exercise or free-form conversation, 2) over one or two interactions. Study 1 and Study 2 were designed to test these nuances using samples drawn from the same population. Study 1 had participants interact with a confederate by engaging in a structured getting-acquainted exercise (Sprecher, 2014b). Study 2 had two zero-acquaintance strangers engage in two free-form conversations. Another major limitation of prior studies is that they used convenient rather than popularly used CMC platforms. Study 1 and the first conversation of Study 2 had dyads interact via FtF, instant-messaging with a photo, or text-messaging. FtF and text-messaging are extremes of the nonverbal continuum, with instant-messaging with a photo falling in the middle of the continuum. These conditions were used to test this effect by

employing more widely used CMC platforms (e.g., text-messaging versus text-chatting on Skype).

By adjusting for these differences, I hypothesized that all three conditions would equivalently produce closeness and liking. However, this proved not to be the case. After the getting-acquainted exercise in Study 1 and the free-form conversation in Study 2, participants who conversed in the FtF condition felt significantly closer than either CMC condition. These results are not due to differences in positivity or comfort with the conversations, mood effects, or gender. Instead, they are likely due to the fact that participants who conversed on the FtF platform perceived that they and their conversation partner self-disclosure more than participants in either of the CMC platforms. This is an inherent confound in Study 1, which was designed to control for self-disclosure across all three platforms. Therefore, there is a need in the future to examine how much participants actually self-disclosed, not just perceived self-disclosure. This difference in closeness is contradictory to the pilot data collected. In the pilot study, the getting-acquainted exercise was less elaborate. Participants may not have perceived differences in self-disclosure because the conversations were shorter and they answered far fewer questions. However, no measures of perceived self-disclosure were taken in the pilot study to prove this. With regards to liking, participants liked their conversation partners equally in Study 1. In Study 2, dyads liked each other more in the FtF condition than the instant-messaging condition, but not the text-messaging condition. As addressed in Study 2, perhaps complete anonymity is preferred to attempts at simulating nonverbal cues (e.g., preferring text-messaging to the profile picture in instant-messaging because the picture is not quite like FtF). Taken together, Study 1 and the first conversation in Study 2 provide support for media richness theory (Daft & Lengel, 1984; Hu et al., 2004) and cues-filtered-out theory (Culnan & Markus, 1987; Kesler & Sproull, 1992). Both

theories advocate that FtF is the superior platform for developing positive interpersonal outcomes such as closeness and liking.

Study 2 was also designed to test media multiplicity by adding a second interaction. A prior study that did this found no differences after a second interaction using Skype-video (Sprecher, 2014b). The pilot study found greater closeness in dyads that interacted both CMC and FtF rather than FtF alone. In Study 2, dyads first had a free-form conversation across FtF, instant-messaging, and text-messaging. Then, all dyads had a second free-form conversation FtF. There were no differences in closeness and liking after this second conversation. Additionally, all dyads felt as though they self-disclosed equally after this FtF conversation. At first glance, it appears that media multiplicity failed. However, all three conditions had equivalent interpersonal outcomes after the second conversation. After the first conversation, FtF had greater interpersonal outcomes than the CMC platforms. If changes in interpersonal outcomes were the same across conditions, FtF would have had the greatest interpersonal outcomes. Instead, interpersonal outcomes leveled out after the second conversation. This means that there was a greater change in interpersonal outcomes from the first conversation to the second conversation in the CMC platforms, enabling them to catch up the FtF condition. Therefore, this study supports media multiplicity theory (Kraut et al., 2002; Sprecher, 2014b). A combination of platform type (e.g., text-messaging followed by FtF) provided greater hikes in interpersonal outcomes over time than only using one type (e.g., FtF followed by FtF).

Across both studies, increases in self-disclosures produced at least some feelings of closeness and liking. However, the literature is still unclear whether these two positive interpersonal outcomes are developed for the same reasons. There was compelling evidence that responsiveness would mediate the relationship between self-disclosure and closeness. Evidence

also suggested that similarity would mediate the relationship between self-disclosure and liking. Two theoretically compelling mediators, ease of processing and enjoyment of the interaction, had yet to be tested.

Similarity was the most successful mediator. Similarity mediated both closeness and liking in Study 1 and across both conversations in Study 2. It is perhaps not surprising that similarity consistently mediated self-disclosure and liking. Increases in self-disclosure predicted increases in liking. Self-disclosure allows for building common ground (Clark, 1985). As people self-disclose more, there is a greater opportunity to find similarity across a number of dimensions (e.g., Pinel et al., 2006; Taylor et al., 2011). And as perceived similarity increased, so did liking. The similarity-liking effect is a prominent effect in the social psychology literature (Byrne, 1961). The more similar a conversation partner is perceived to be, the more they will be liked (Layton & Insko, 1974; Norton, Frost, & Ariely, 2007). More surprisingly is that similarity consistently mediated self-disclosure and closeness. There was scant evidence in the literature to support this prediction. One study found increases in similarity was found to predict increases in closeness, but only after a similarity induction task (Sprecher, 2014a). The current studies support this finding that similarity can not only influence liking, but closeness as well.

Enjoyment of the interaction produced opposite results across the studies. In Study 1, it was a mediator for self-disclosure and closeness. In Study 2, it was a mediator for liking in both conversations. The major difference between these two studies was the way in which participants self-disclosed (i.e. getting-acquainted exercise versus free-form conversations). A possible explanation could lie in the type of information participants were sharing. In Study 1, the getting-acquainted exercise forced participants to self-disclosure increasingly intimate information. This means that they covered more depth than breadth. So perhaps as depth of the

self-disclosure increased, participants enjoyed the interaction, which influence closeness. Conversely in Study 2, a perusal of the conversations showed that dyads talked more about a breadth of topics than depth. Thus, increases in breadth of self-disclosures influenced participants to enjoy the conversation, which in turn influenced increased liking.

Responsiveness was only a significant mediator in Study 1. Responsiveness was most likely not a significant mediator due to the motivation level of the participants. Students participated in these studies with the goal of attaining course credit, not building new friendships. They did not feel the need to demonstrate attentiveness or interest in the conversation. The fact that responsiveness was a significant mediator in Study 1 could be a byproduct of the getting-acquainted exercise. One strategy people can use to demonstrate responsiveness is by reciprocating self-disclosures (Berg & Archer, 1980; Davis & Perkowitz, 1979). Because the getting-acquainted exercise forced participants to equivalently self-disclose, they felt as though their conversation partner was being responsiveness. This is further evidenced by responsiveness not being a significant mediator in Study 2. In Study 2, participants had free-form conversations. Without this enforced disclosure, responsiveness was no longer a significant mediator.

Ease of processing was not a significant predictor in either study. In both studies, the ease of processing index varied little across participants and conditions. Even with differences in self-disclosure, participants thought the self-disclosure process was extremely easy across both studies. Because of this lack of variability, ease of processing could not be a significant mediator. This lack of variability in this index could be attributed to the fact that participants genuinely thought it was easy to engage in the self-disclosure process across all conditions. Alternatively, there could be a problem with the ease of processing index itself. This index was

created for this set of studies and has not been proven reliable or valid. This index might not actually be testing what I had intended it to measure. All in all, it could be an ineffective measure. Further research is needed to investigate whether this is the case.

Taken together, perhaps the reason why some studies find closeness and liking follow similar patterns after self-disclosing is because participants found similarity. However, the current findings investigating mediators should be replicated with a much larger sample. The tests of mediation in this set of studies is very underpowered and therefore cannot be consider very reliable or valid. The test of mediation here should also have been done with the three platforms as one variable as a continuum of nonverbal cues, rather than mediation analyses being run for each platform on its own. Further research and more participants in needed to validate these findings and properly answer the research questions.

In sum, I replicated past research findings. By using two samples from the same population of students, I was able to compare and contrast design methods from the literature on more widely used CMC platforms. By doing so, these studies replicated past findings that FtF is a superior platform and that mixed-platform interactions produce greater interpersonal outcomes over time. The studies also found continued evidence for the similarity-liking effect. Although the proposed hypotheses were largely unsupported, the fact that these two studies nicely replicated findings within this small literature is an important find. Psychological science is going through a replicability crisis, in which the results of many well-known studies cannot be reproduced (Stroebe, 2016). Today, the ability to replicate existing findings is just as important as finding new, novel contributions.

The present set of studies are not without their limitations. Some previous research has found gender effects on self-disclosures on CMC platforms and interpersonal outcomes (e.g.,

Guadagno & Cialdini, 2007; McKenna et al., 2002), though not all (Okdie et al., 2011). No significant gender effects for either closeness or liking were found in either study. However, randomly assignment for gender across condition in Study 1 failed, resulting in very few males in the instant-message condition. Additionally, there were very few male-male dyads to compare to the mixed-gender dyads and female-female dyads in Study 2. Although results did not change when male-male dyads were excluded, it is possible that the sample size in Study 2 for any statistically powerful and meaningful gender effects. Relatedly, further analyses are needed to investigate the role of each of the proposed mediators across the individual platform self-disclosures (e.g., FtF self-disclosures, instant message self-disclosure, text-message self-disclosures). The current sample sizes are too small in each of the conditions for statistical powerful and meaningful results.

One major limitation to the current set of studies, and previous studies that have investigated this phenomenon, is lack of ecological validity. All of these studies have investigated how people develop relationships within the laboratory setting. A psychology laboratory is a safe environment where nothing harmful will happen to the participants or their information. Because of this safety net, it is hard to truly see the generalizable effects of self-disclosing on CMC platforms. Anonymity has been posited to be good for self-disclosure because it levels the playing field (e.g., Brunet & Schmidt, 2008; Ward & Tracey, 2004) and can enable people to self-disclose more because they feel "disembodied" from the experience (Leiter & Dowd, 2010). However, to self-disclose entails imparting identifying information about the self to other people. In CMC environments that are not safe environments, are self-disclosures still likely to go up? Perhaps individuals, especially in younger generations, trust in the digital

age and are very willing to self-disclose. Gone could be the days where "on the internet, no one knows you're a dog" (Christopherson, 1997).

The present studies indicate that FtF is more effective at facilitating positive interpersonal outcomes, and thus developing relationships, compared to CMC. However, the fear that CMC is inadequate and detrimental to relationships is unfounded. After a single interaction, closeness and liking were still developed in CMC platforms, though not to the same degree as FtF. In fact, combining CMC and FtF produced the same end result as interacting FtF alone.

Humans are social animals and will continue to seek out live interactions. People, especially children and romantic relationships, still need the physical contact and intimacy that can only be achieved via face-to-face. However, technology and computer-mediated communication is here to stay. It is time to keep an eye on the horizon. Children today are born and raised in a time where they haven't lived without computers or cell-phones. As they mature in a society relying more on technology and less on face-to-face communications, this could fundamentally change how they interact with other people…and even social norms!

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Tables

Table 1. Study 1 closeness and liking indexes with standard errors across platform type.

	Closeness	Liking
FtF	3.75_a	5.38_a
	(.17)	(.18)
Text	3.12_b	5.13_a
	(.19)	(.20)
IM	2.81_b	5.04_a
	(.25)	(.27)

Note. Means not sharing subscripts differ at $p < .05$.

Table 2. Study 1 relationship between self-disclosure on closeness and liking (pathway c).

	b	SE	t	p	R^2
	Closeness				
Self-Disclosure	.646	.075	8.582	.000	.424
	Liking				
Self-Disclosure	.505	.086	5.906	.000	.509

Table 3. Study 1 analyses of mediators regressed on self-disclosure, for closeness and liking (pathway a).

	b	SE	t	p	R^2
Responsiveness	.457	.056	8.119	.000	.397
Similarity	.804	.104	7.707	.000	.373
Ease of Processing	.354	.060	5.940	.008	.187
Enjoyment of Interaction	.727	.082	8.832	.000	.438

Table 4. Study 1 analyses of mediator relationship of closeness and liking (pathway b).

	b	SE	t	p	R^2
	Closeness				
Responsiveness	.025	.136	.181	.857	
Similarity	.254	.069	3.707	.000	
Ease of Processing	-.172	.118	-1.468	.145	
Enjoyment of Interaction	.237	.092	2.591	.011	.621
	Liking				
Responsiveness	.327	.159	2.058	.042	
Similarity	.194	.080	2.413	.018	
Ease of Processing	-.038	.138	-.274	.785	
Enjoyment of Interaction	.178	.107	1.665	.099	.589

Table 5. Closeness and liking indexes across platform type and timing of conversation.

	FtF	TEXT	IM
	Closeness		
Conversation 1	3.10	2.44	2.53
	(.12)	(.12)	(.13)
Conversation 2	3.45	3.57	3.63
	(.14)	(.14)	(.16)
	Liking		
Conversation 1	5.32	5.37	4.57
	(.21)	(.28)	(.21)
Conversation 2	5.45	5.83	5.18
	(.25)	(.33)	(.25)

Table 6. Study 2 relationship between self-disclosure on closeness and liking, for both conversations.

	b	SE	t	p	R^2
	Closeness				
Conversation 1	.572	.065	8.387	.000	.453
Conversation 2	.603	.083	7.252	.000	.382
	Liking				
Conversation 1	.503	.088	5.719	.000	.278
Conversation 2	.600	.110	5.460	.000	.260

Table 7. Study 2 pathway a analyses of mediators regressed on self-disclosure, across platform type after the first conversation.

	b	SE	t	p	R^2
	Conversation 1				
Responsiveness	.464	.068	6.8052	.000	.353
Similarity	.697	.117	5.953	.000	.353
Ease of Processing	.221	.061	3.635	.000	.152
Enjoyment of Interaction	.638	.139	4.607	.000	.135
	Conversation 2				
Responsiveness	.605	.090	6.696	.000	.345
Similarity	.805	.121	6.642	.000	.342
Ease of Processing	.227	.069	3.284	.002	.113
Enjoyment of Interaction	..807	.118	6.861	.000	.356

Table 8. Study 2 regressions of closeness and liking regressed on mediators, after the first conversation (pathway b).

	b	SE	t	p	R^2
	Closeness				
Responsiveness	.073	.132	.551	.583	
Similarity	.148	.061	2.422	.018	
Ease of Processing	-.026	.140	-.188	.851	
Enjoyment of Interaction	.065	.052	1.260	.211	.514
	Liking				
Responsiveness	.251	.147	1.702	.100	
Similarity	.2284	.068	3.360	.001	
Ease of Processing	.287	.156	1.837	.090	
Enjoyment of Interaction	.1722	.057	2.997	.004	.562

Table 9. Study 2 regressions of closeness and liking regressed on mediators, after the second conversation (pathway b).

	b	SE	t	p	R^2
	Closeness				
Responsiveness	.098	.160	.616	.540	
Similarity	.166	.075	2.204	.030	
Ease of Processing	-.024	.188	-.129	.898	
Enjoyment of Interaction	.168	.094	1.786	.078	.508
	Liking				
Responsiveness	.190	.147	1.290	.201	
Similarity	.239	.070	3.435	.000	
Ease of Processing	.258	.174	1.488	.141	
Enjoyment of Interaction	.379	.087	4.373	.000	.716

Figures

Figure 1. Closeness and Liking index means and standard errors across platform type.

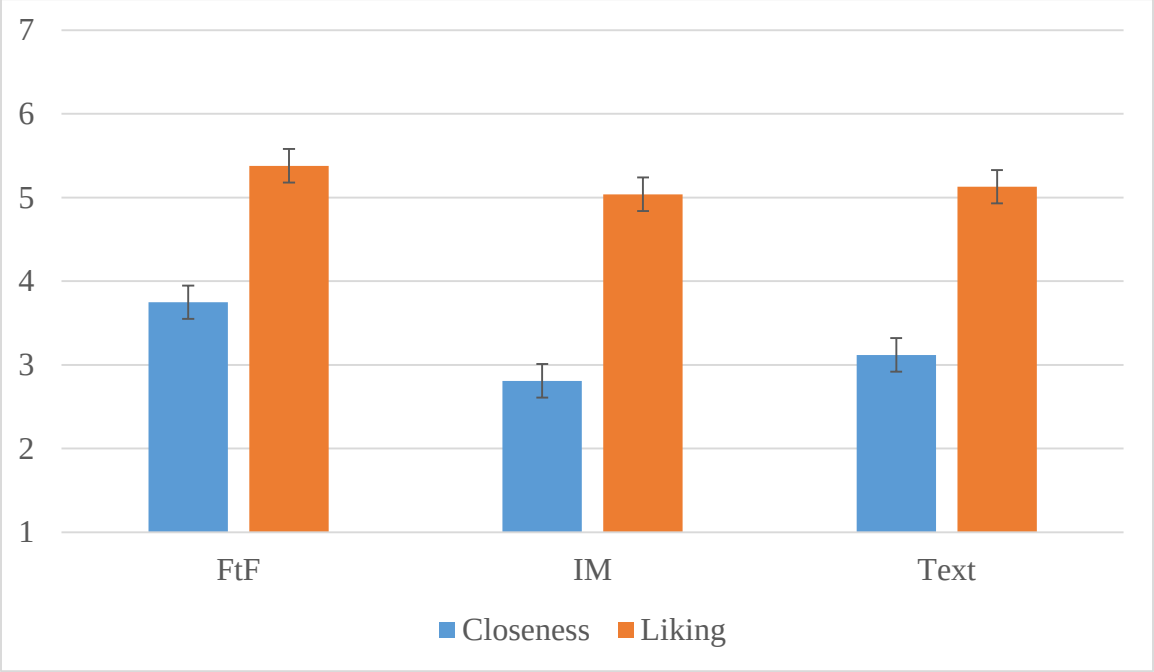


Figure 2. Mediation model of self-disclosure as a predictor of closeness, mediated by similarity.

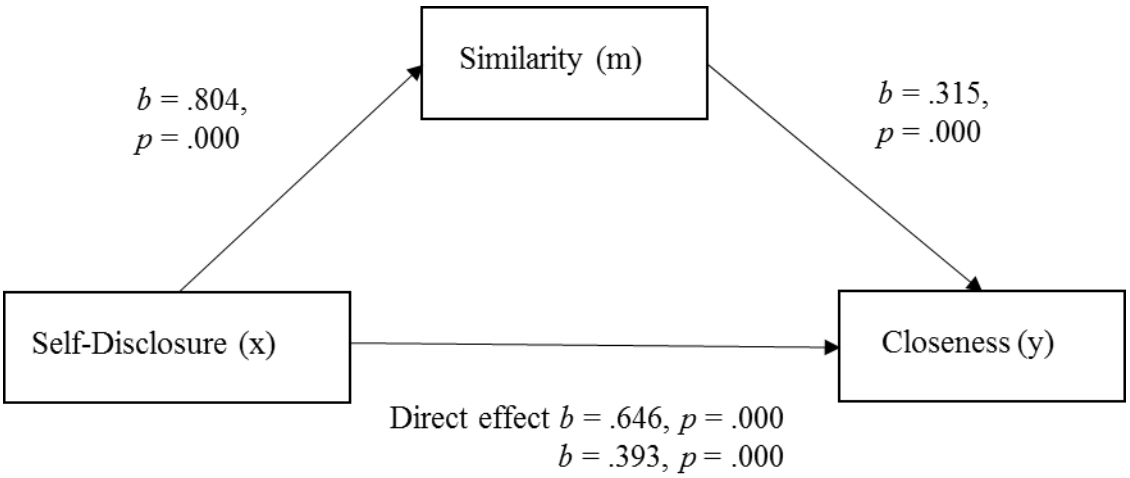


Figure 3. Mediation model of self-disclosure as a predictor of closeness, mediated by enjoyment of the interaction.

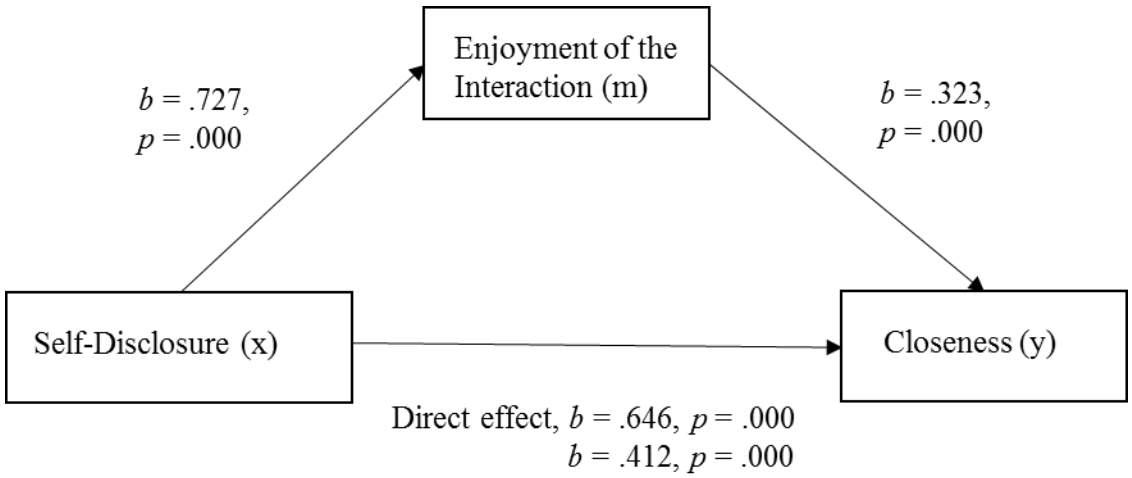


Figure 4. Mediation model of self-disclosure as a predictor of liking, mediated by responsiveness.

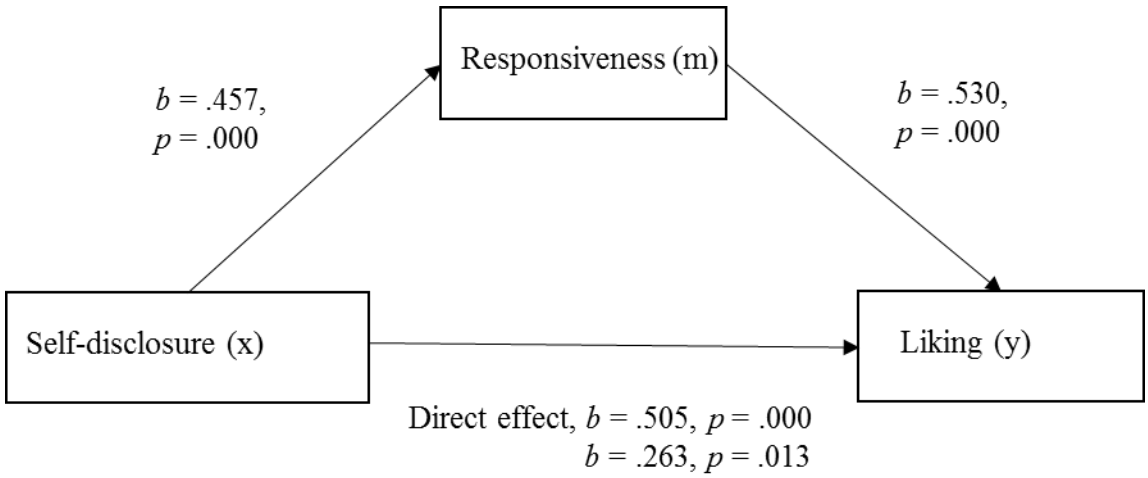


Figure 5. Mediation model of self-disclosure as a predictor of liking, mediated by similarity.

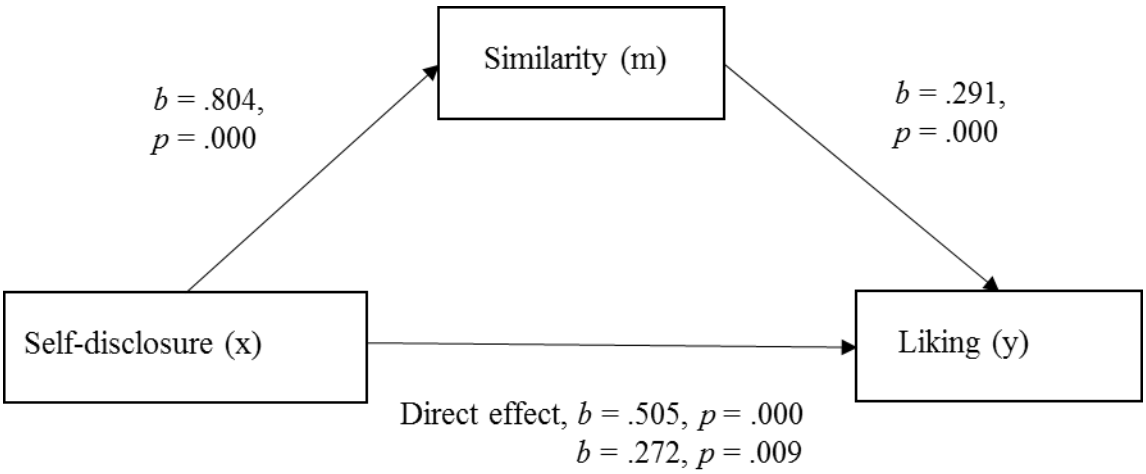


Figure 6. Closeness index means and standard errors across platform type and timing of the conversation.

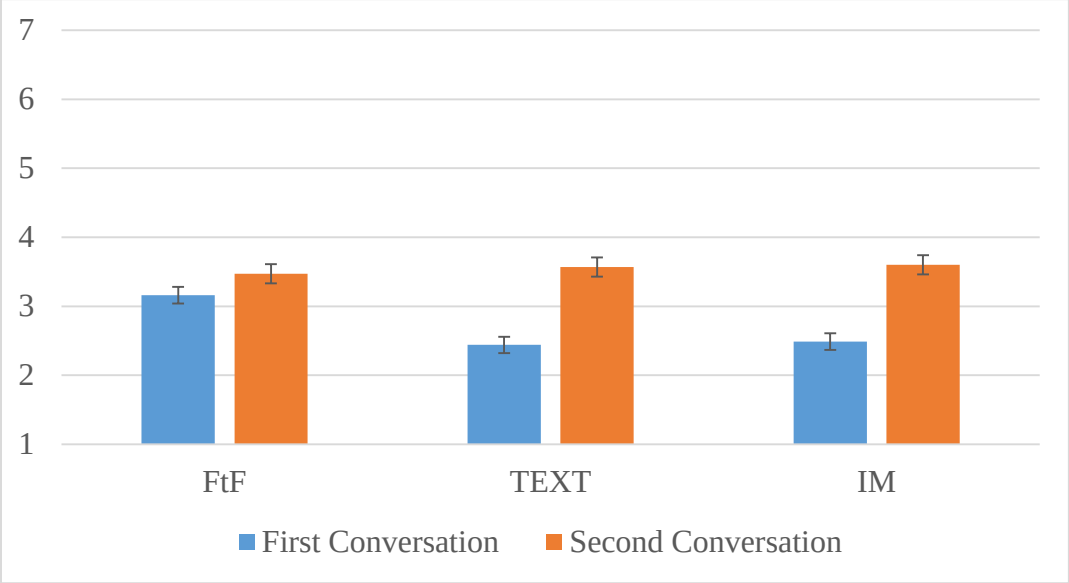


Figure 7. Liking index means and standard errors across platform type and timing of the conversation.

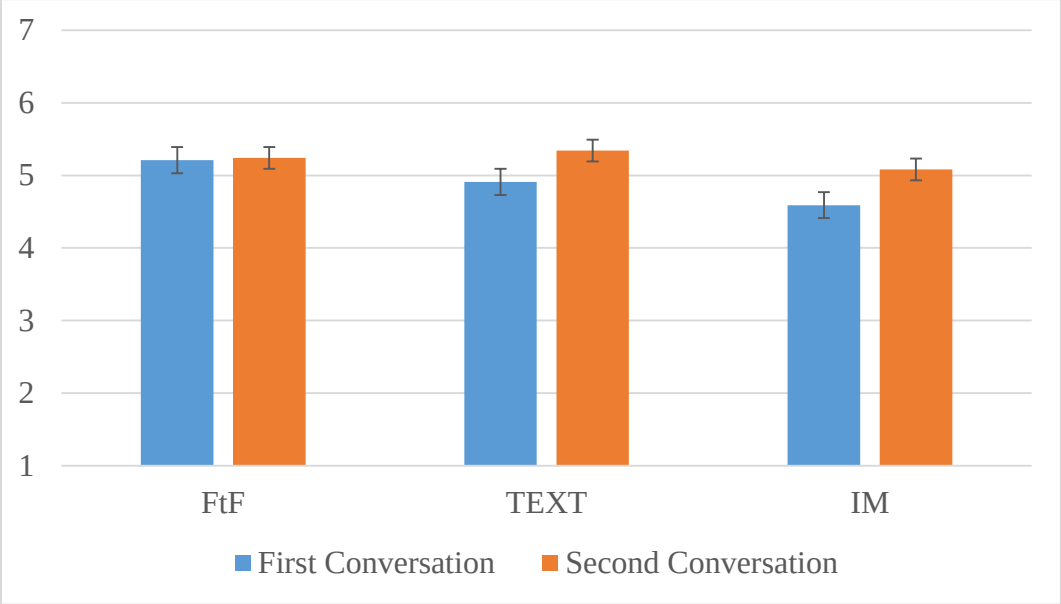


Figure 8. Mediation model of self-disclosure and closeness, with similarity as a mediator, after the first conversation.

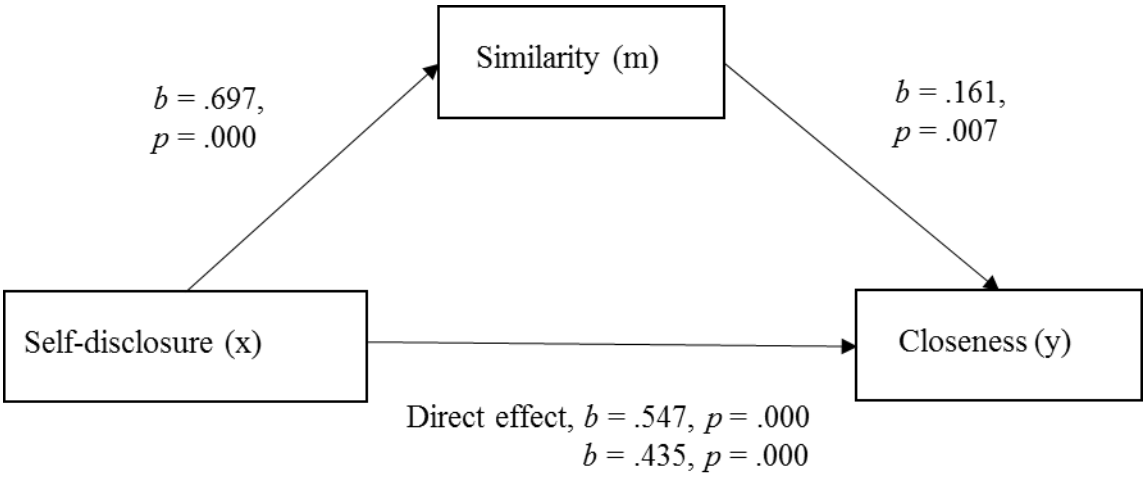


Figure 9. Mediation model of self-disclosure and liking, with similarity as a mediator, after the first conversation.

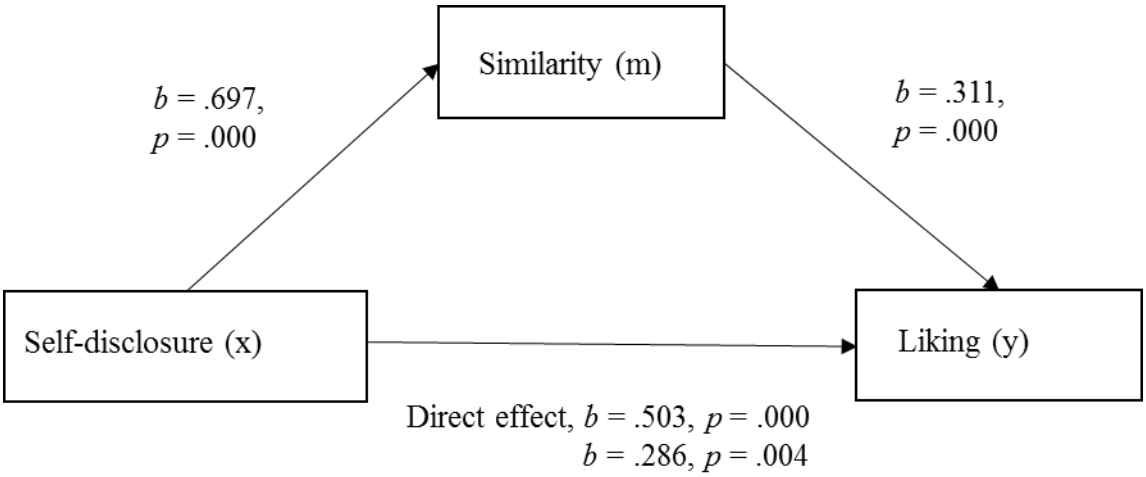


Figure 10. Mediation model of self-disclosure and liking, with enjoyment of the interaction as a mediator, after the first conversation.

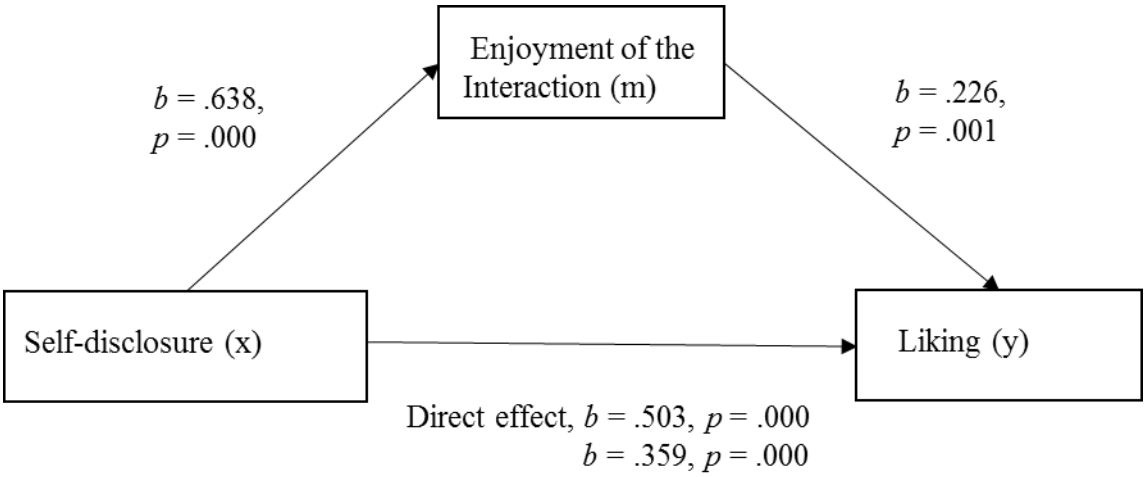


Figure 11. Mediation model of self-disclosure and closeness, with similarity as a mediator, after the second conversation.

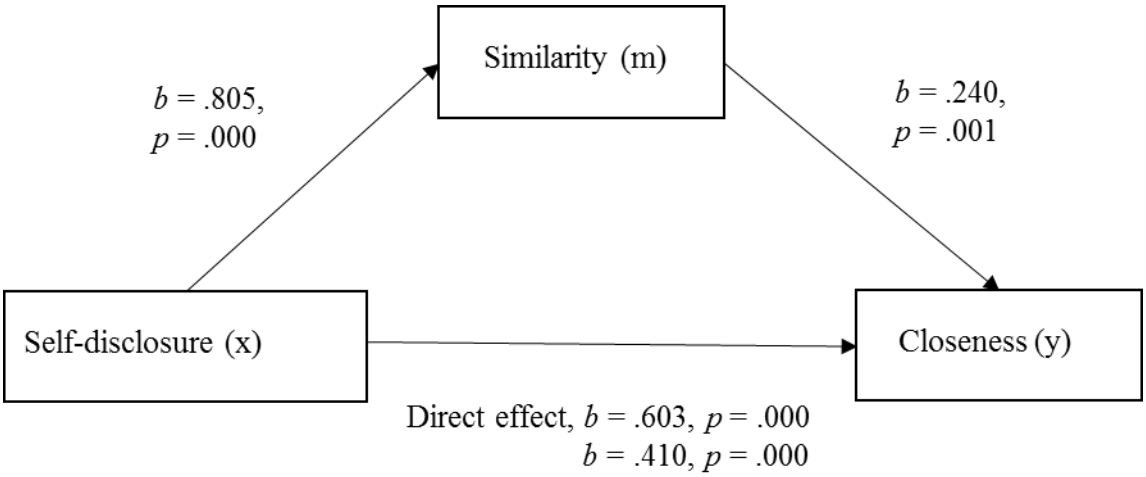


Figure 12. Mediation model of self-disclosure and liking, with similarity interaction as a mediator, after the second conversation.

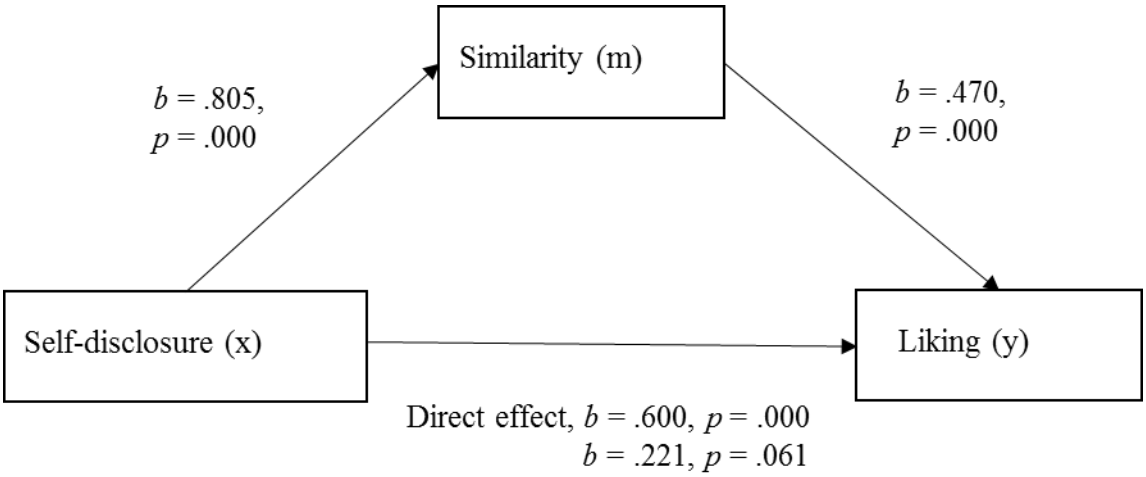
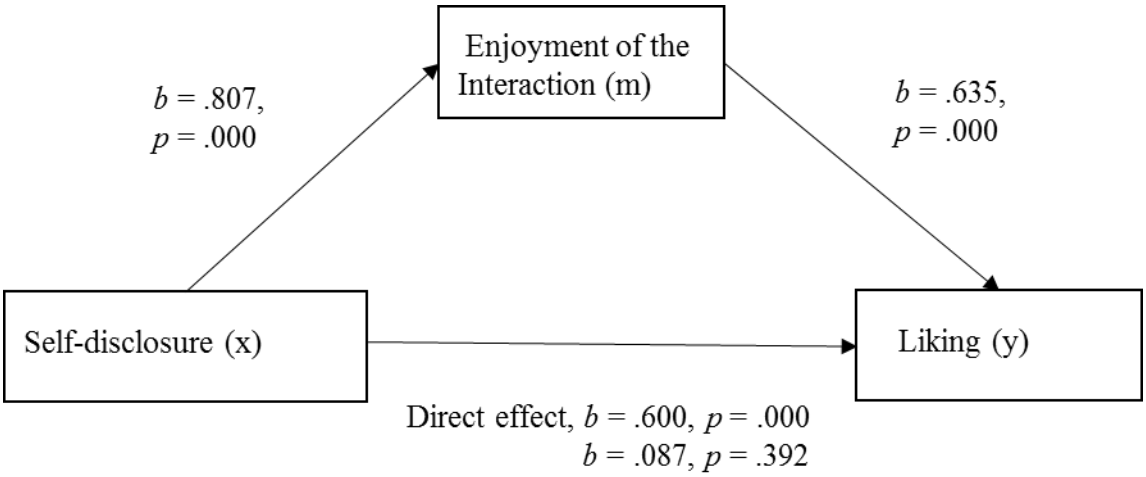


Figure 13. Mediation model of self-disclosure and liking, with enjoyment of the interaction as a mediator, after the second conversation.



APPENDIX A.

Getting-Acquainted Exercise

List One

1) What is your name?
2) How old are you?
3) Where are you from?
4) What year are you at the University of Arkansas?
5) Have you picked a major yet? If so, what is it and why did you pick it?
6) What made you come to the University of Arkansas?
7) What is your favorite class so far at the University of Arkansas? Why?

List Two

1) What are some thing you like to do for fun?
2) What would like you to do after you graduate from the University of Arkansas?
3) What is something you have always wanted to do or try?
4) If you could travel anywhere in the world, where would you go and why?
5) What is one habit you'd like to break?
6) What is one embarrassing event that has happened to you?

List Three

1) If you could have one wish granted, what would it be?
2) Is it difficult or easy for you to meet new people? Why?
3) What is one of your biggest fears?
4) What is your most memorable childhood memory?
5) What is something that people would consider surprising about you?
6) What is an accomplishment that you are proud of?
7) What is a memorable experience you've had with a good friend?

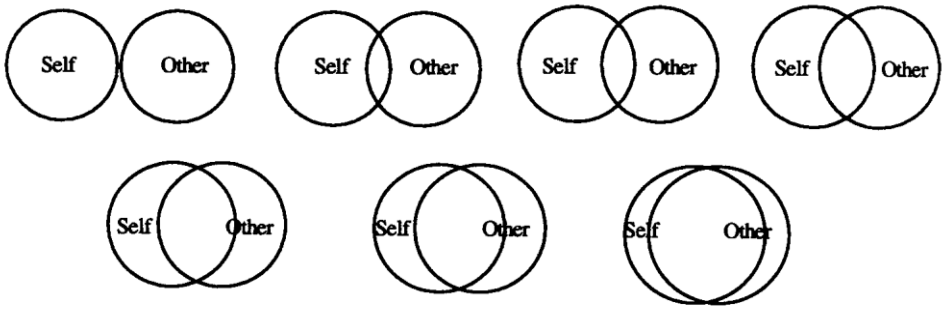
APPENDIX B.

Questionnaire – Study 1

Please respond to the following items with a number between 1 (not at all) and 7 (very much).

1. _____I often engage in conversations similar to the one I just engaged in.
2. _____My conversation partner was on the same wavelength with me.
3. _____ I feel like I learned a lot about my conversation partner.
4. _____I think the majority of my friends would discuss things similar to those we discussed in this conversation.
5. _____It was easy to share information with my conversation partner.
6. _____I feel close to my conversation partner.
7. _____My conversation partner seemed interested in what I was thinking and feeling.
8. _____ My conversation partner and I discussed a few topics in depth.
9. _____ I like my conversation partner.
10. _____I feel like the information shared was positive.
11. _____It was easy to talk **[FtF/Text/IM]** with my conversation partner.
12. _____ My conversation partner was responsive to me during the conversation
13. _____I felt uncomfortable with the information shared.
14. ____ I had a hard time sharing information with my conversation partner.
15. _____I feel like my conversation partner and I discussed a lot of different topics.
16. _____I feel very similar to my conversation partner.
17. _____It was easy to understand my conversation partner.
18. _____I feel like I have a lot in common with my conversation partner.
19. _____ My conversation partner and I discussed memories of personally significant life experiences.
20. _____My conversation partner seemed to really listen to me.
21. _____I feel like I learned very little about my conversation partner.
22. _____I had a hard time understanding my conversation partner.
23. _____I learned a lot about my conversation partner based on their appearance.

24. Considering yourself as Self and your conversation partner as Other, please circle the picture below that best describes the way you see the relationship between you and your conversation partner right now.



25. How likely would you be to use the term “we” to characterize you and your conversation partner? (Circle one number on the scale below.)

1 2 3 4 5 6 7
<------ |------- |------- |------- |------- |------- |------- |------->
not at all moderately extremely

26. Relative to all your other relationships (both same and opposite sex), how would you characterize your relationship with your conversation partner? (Circle one number on the scale below.)

1 2 3 4 5 6 7
<------ |------- |------- |------- |------- |------- |------- |------->
not at all moderately extremely
close close close

27. Relative to what you know about other people's close relationships, how would you characterize your relationship with your conversation partner?

1 2 3 4 5 6 7
<------ |------- |------- |------- |------- |------- |------- |------->
not at all moderately extremely
close close close

28. Please rate how much you would like this person outside of the lab.

1 2 3 4 5 6 7
<------|----------|----------|----------|----------|----------|----------|------->
Not at all Very Much

29. Please rate how much you would like to work with this person again in an experiment.

1 2 3 4 5 6 7
<------|----------|----------|----------|----------|----------|----------|------->
Not at all Very Much

30. Please rate how much you would like to spend time with this person outside of the lab.

1 2 3 4 5 6 7
<------|----------|----------|----------|----------|----------|----------|------->
Not at all Very Much

Please respond to the following items with a number between 1 (not at all) and 7 (a great deal).

____How much did you enjoy the interaction?
____How much did you enjoy your role in the interaction?
____How much did you and the other laugh during the interaction?
____How much fun was the interaction?

This scale consists of a number of words that describe different feelings and emotions. Read each item and then write in a number in the space next to that word. Indicate to what extent you feel this way RIGHT NOW. Use the following scale to indicate how much you feel each emotion.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

_____ interested	_____ sympathetic	_____ excited
_____ enthusiastic	_____ softhearted	_____ happy
_____ angry	_____ warm	_____ irritable
_____ alert	_____ compassionate	_____ moved
_____ attentive	_____ tender	_____ sad
_____ anxious		

Demographics

Were you suspicious during this experiment? (please circle one): Yes No

If yes, why were you suspicious?

Your gender (please circle one): Male Female

Your age: _____

Your ethnicity (please circle all that apply):

White/Caucasian
Black/African American
Asian/Asian American
Pacific Islander
Hispanic/Latino
Native American
Other

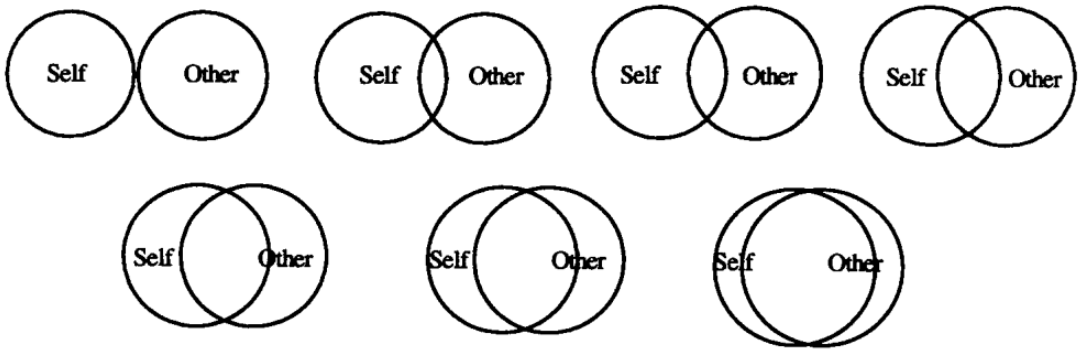
APPENDIX C.

Questionnaire - Study 2

Please respond to the following items with a number between 1 (not at all) and 7 (very much).

1. _____I often engage in conversations similar to the one I just engaged in.
2. _____My conversation partner was on the same wavelength with me.
3. _____ I feel like I learned a lot about my conversation partner.
4. _____I think the majority of my friends would discuss things similar to those we discussed in this conversation.
5. _____It was easy to share information with my conversation partner.
6. _____I feel close to my conversation partner.
7. _____My conversation partner seemed interested in what I was thinking and feeling.
8. _____ My conversation partner and I discussed a few topics in depth.
9. _____ I like my conversation partner.
10. _____I feel like the information shared was positive.
11. _____It was easy to talk face-to-face with my conversation partner.
12. _____ My conversation partner was responsive to me during the conversation
13. _____I felt uncomfortable with the information shared.
14. ____ I had a hard time sharing information with my conversation partner.
15. _____I feel like my conversation partner and I discussed a lot of different topics.
16. _____I feel very similar to my conversation partner.
17. _____It was easy to understand my conversation partner.
18. _____I feel like I have a lot in common with my conversation partner.
19. _____ My conversation partner and I discussed memories of personally significant life experiences.
20. _____My conversation partner seemed to really listen to me.
21. _____I feel like I learned a lot about my conversation partner.
22. _____ I had a hard time understanding my conversation partner.
23. _____ I learned a lot about my conversation partner based on their appearance.

24. Considering yourself as Self and your conversation partner as Other, please circle the picture below that best describes the way you see the relationship between you and your conversation partner right now.



Please respond to the following items by circling a number on the scale below the questions.

25. How likely would you be to use the term "we" to characterize you and your conversation partner?

1	2	3	4	5	6	7
Not at all close						Extremely close

26. Relative to all your other relationships (both same and opposite sex), how would you characterize your relationship with your conversation partner?

1	2	3	4	5	6	7
Not at all close						Extremely close

27. Relative to what you know about other people's close relationships, how would you characterize your relationship with your conversation partner?

1	2	3	4	5	6	7
Not at all close						Extremely close

28. Please rate how much you would like this person outside of the lab.

1	2	3	4	5	6	7
Not at all						Very Much

29. Please rate how much you would like to work with this person again in an experiment.

1	2	3	4	5	6	7
Not at all						Very Much

30. Please rate how much you would like to spend time with this person outside of the lab.

1	2	3	4	5	6	7
Not at all						Very Much

Please respond to the following items with a number between 1 (not at all) and 7 (a great deal).

____How much did you enjoy the interaction?
____How much did you enjoy your role in the interaction?
____How much did you and the other laugh during the interaction?
____How much fun was the interaction?

This scale consists of a number of words that describe different feelings and emotions. Read each item and then write in a number in the space next to that word. Indicate to what extent you feel this way RIGHT NOW. Use the following scale to indicate how much you feel each emotion.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

_____ interested	_____ sympathetic	_____ excited
_____ enthusiastic	_____ softhearted	_____ happy
_____ angry	_____ warm	_____ irritable
_____ alert	_____ compassionate	_____ moved
_____ attentive	_____ tender	_____ sad
_____ anxious		

Demographics

Did you know your conversation partner prior to today (please circle one): Yes No

Your gender (please circle one): Male Female

Your age: _____

Your ethnicity (please circle all that apply):
White/Caucasian
Black/African American
Asian/Asian American
Pacific Islander
Hispanic/Latino
Native American
Other

UNIVERSITY OF ARKANSAS

March 3, 2016

MEMORANDUM

TO:	Nicole Brandon Denise Beike
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	16-02-525
Protocol Title:	*Getting Acquainted with Strangers*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 03/01/2016 Expiration Date: 02/28/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 200 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

UNIVERSITY OF ARKANSAS

March 3, 2016

MEMORANDUM

TO:	Nicole Brandon Denise Beike
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	16-02-526
Protocol Title:	*Having Conversations with Strangers*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 03/01/2016 Expiration Date: 02/28/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

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If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu