

GETTING BACK WHAT YOU PUT IN: THE PERCEIVED REALITY OF ONLINE  
INTERACTIONS

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## **ABSTRACT**

Jenna L. Clark: Getting Back What You Put In: The Perceived Reality of Online Interactions  
(Under the direction of Melanie C. Green)

Past research on the consequences of online social interactions demonstrates a wealth of contradictions; however, incorporating attitudes as a predictor of specific online behaviors may clarify when online interactions are beneficial and when they are detrimental. Study 1 examined the perceived reality of online interactions (PROI; the extent to which an individual views online interactions as suitable for the maintenance and formation of close relationships) as a predictor of perceived social support from online sources. Although PROI was not successfully experimentally manipulated, it was a significant predictor of perceived social support from online sources across both student and Amazon Mechanical Turk populations. A second experiment manipulated PROI to examine its effect on expected positive outcomes in a hypothetical online interaction. Measured PROI but not manipulated PROI significantly influenced expected positive outcomes, and this effect was mediated via willingness to self-disclose and to provide social support.

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## **CHAPTER 1: STUDY 1: INTRODUCTION**

The Internet is growing more ubiquitous every day. As of June 2012, Internet users comprise 34.3% of the world's population; in North America alone, 78.6% of people are connected to the Internet. From 2000 to 2012, the number of Internet users increased 566% worldwide – from approximately 361 million to 2.4 billion (Internet World Stats, 2012).

As the Internet has entered more and more people's lives, it has become increasingly popular as a venue for social interaction. Up-to-date statistics about social behavior on the Internet are harder to find than overall user information; however, in 2009, the Norton Online Living Report stated that 70% of their Internet-using sample used instant messaging to talk to others, and 60% had made a new friend over the Internet. In fact, Wang and Wellman (2010) found that 22% of participants reported having friends that they only knew online. Among heavy users of the Internet (3 or more hours of use a day), this figure was as high as 45%.

The Internet has clearly become a sizable part of our social networks. Less clear-cut, however, are its effects on its users. Since the Internet's rise, two basic camps of scholarship about its effects have arisen: disconnection and connection (see Katz, Rice, & Aspden, 2001, for an in-depth discussion of both perspectives). The first and earliest approach considered social Internet use as an essentially negative phenomenon, highlighting consequences that seemed to lead to social isolation and unhappiness. The second approach highlighted the Internet's potential to instead bring people closer together and contribute to their well-being.

## **Disconnection versus Connection**

The HomeNet study (Kraut, Patterson, Lundmark, Kiesler Mukopadhyay, & Scherlis, 1998) was one of the first and most influential studies on Internet use. Examining households in Philadelphia after the initial introduction of the Internet, Kraut et al. found that greater use of the Internet led to decreases in family communication and size of the local social network, and increases in loneliness and depression. Kraut et al. suggested these results could be explained by a time displacement hypothesis – time spent on the Internet was time not spent with family or friends, and lowers well-being through replacement of such activities. Work by Nie (Nie & Erbring, 2000; Nie, 2001) seemed to confirm this hypothesis by finding the expected decrease in time spent socializing.

As research on the Internet continued, however, conflicting results began to amass. Wastlund, Norlander and Archer (2001) replicated the HomeNet study, but did not find the same negative effects. Examinations of specifically social use of the Internet demonstrated links to decreased depression and loneliness, causing increases in well-being (Shaw & Gant, 2002; Morgan & Cotton, 2003; Bessiere, Kiesler, Kraut & Boneva, 2008). Katz, Rice and Aspen (2001) conducted a review of studies on the Internet published between 1995-2000, finding no negative and the suggestion of some positive overall impacts of Internet use.

When Kraut et al. (2002) revisited the HomeNet sample and found that the negative effects of Internet use no longer appeared, one could think that the final nail had been placed in the coffin of the disconnection hypothesis. However, other research continued to link negative outcomes to Internet use (Chen & Peng, 2008; Jacobsen & Forste, 2011; Matsuba, 2006). Examining the overall picture, a recent meta-analysis of 43 studies (Huang, 2010) found a very small negative correlation ( $r = -0.05$ ) between Internet use and well-being. Type of Internet use,

indicator of well-being, quality of the Internet use measure, and participant age and gender all failed to significantly influence this process.

### **The Consequences of Online Interactions**

Does Internet use then have only a very minor link with well-being? A more in-depth look at Huang's meta-analysis complicates the picture. Thirty of the forty-three studies included operationalized Internet use as merely total number of hours on the Internet. While this is perhaps the simplest way to measure Internet activity, it is also extremely crude. The Internet allows for multiple kinds of use, such as leisure, schoolwork, business or socialization. Several of the studies in Huang's meta-analysis did look more specifically at hours spent weekly in these specific categories, particularly social use of the Internet.

Indeed, for social psychologists, social use of the Internet holds the most interest and promise as a source of study. However, within this umbrella category, there are still more differentiated activities; within those activities, there are still more differentiated behaviors. We do not tend to study face-to-face social interaction by simply looking at the number of hours a week that an individual spends in the presence of others; neither can we adequately study online social interaction in a similar way.

A small body of research has already suggested that a more nuanced view of online social interaction reaps dividends in understanding. Online social interaction with strangers leads to negative effects on well-being in adolescents, whereas online social interaction with friends leads to positive effects on well-being in adolescents via increased relationship closeness (Valkenburg & Peter, 2007). In other research, approach motivations and interest in the perspectives of others were linked to relationship-building uses of Facebook, whereas avoidance motivations and active dislike for the perspectives of others were linked to non-relationship-building use of Facebook

(Carpenter, Green & LaFlam, 2011). Freshmen with many Facebook friends show lower social and emotional adjustment, but upperclassmen with many Facebook friends show higher social and emotional adjustment; this finding appears to be due to the older students' more effective use of Facebook to maintain and form real connections (Kalpidou, Costin & Morris, 2011). Ultimately, this research suggests that online social interaction can be a force for connection or disconnection, depending on the behaviors one chooses.

### **The Perceived Reality of Online Interactions**

If behavioral choices might explain the differential outcomes of online social interaction, what variables might explain behavioral choices? Why do some individuals pursue relationship-building behavior online, while others eschew it?

Attitudes provide a powerful potential explanation for this phenomenon. Negative attitudes toward online social interactions are widespread. Most people consider online interactions to be inferior in quality compared to face-to-face interactions (Chan & Cheng, 2004; Peter & Valkenburg, 2006; Schiffrin, Edelman, Falkenstern & Stewart, 2010; Baym, Zhang, & Lin, 2004). Classic theories in communication studies such as the cues-filtered-out perspective (Culnan & Markus, 1987; Rice, 1993) and media richness theory (Daft & Lengel, 1984, 1986; Trevino et al., 1987) suggest that computer-mediated-communication is inherently inferior due to lacking cues such as nonverbal behavior and tone of voice. Richer media (media that possess more cues) are preferred for more ambiguous and important messages, which may lead to a desire to avoid personal conversations online.

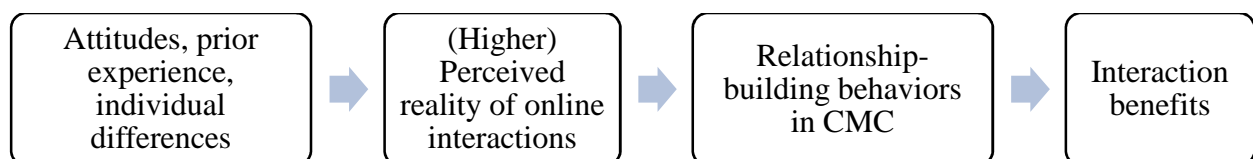
It is worth noting that not all individuals perceive computer-mediated communication as inferior; lower age, higher social anxiety, and higher loneliness are all factors linked to a preference for online social interaction over face-to-face social interaction (Peter & Valkenberg,

2006; Caplan 2002, 2003, 2005). Why might it appeal to these individuals? Research has suggested that online social interaction is seen as less risky (Green & Brock, 2008; McKenna & Bargh, 1999, 2000) and less effortful/more easy (Green & Brock, 2008; McKenna & Bargh, 2000).

Taking into account these two different perspectives, a continuum of attitudes towards computer-mediated communication as a venue for social interactions becomes apparent. We define this concept as ‘the perceived reality of online interactions’, or the extent to which an individual believes that online social interactions are suitable for the maintenance and formation of close relationships. The term reality is used in this context to map onto a common layperson’s definition: online interactions or relationships are often referred to as “not real”.

### **Perceived Reality and the Outcomes of Online Interactions**

The perceived reality of online interactions is theorized to drive the outcomes of online social interaction. Individuals who are high in perceived reality will approach online social interaction believing that it is possible to create or maintain a relationship via computer-mediated communication. As such, they will engage in relationship-building behaviors, and will reap benefits in closeness and relationship strength from their online interactions. Individuals who are low in perceived reality may avoid online social interaction, or may simply feel that it is best used for more utilitarian sorts of communication. As such, they will not invest effort in relationship-building behaviors, and gain very little from online social interaction. Figure 1 below demonstrates this process.



*Figure 1.* Conceptual model for the perceived reality of online interactions.

## **Perceived Reality and Social Support**

Many different behaviors may be encompassed within the general heading of ‘relationship-building behaviors’. Prior research (Wentzel & Erdley, 1993; Baxter & Philpott, 1982) has identified a list of friendship-forming strategies that may all be applicable: initiate interaction, be ‘nice’, commit prosocial behaviors, respect others, provide social support, demonstrate similarity, engage in self-presentation, and solicit personal information about the interaction partner. Of these behaviors, social support is one of the best-studied within the context of online social interactions.

Social support is a nebulous, multi-dimensional concept defined differently from researcher to researcher. For example, House (1981) defines social support as “an interpersonal transaction involving one or more of the following: (1) emotional concern (liking, love, empathy), (2) instrumental aid (goods or services), (3) information (about the environment) and (4) appraisal (information relevant to self-evaluation)” (p. 39). On the less specific end, Wilcox and Vernberg (1985) simply define the target of social support research as “the influence the interpersonal environment has on health” (p. 8). For the purpose of this research, social support will be viewed through a similarly broad lens: benefits and resources gained through interpersonal interaction and connection.

Regardless of definitions, social support has been established as a highly beneficial and positive resource. It has been linked to decreased mortality (Berkman & Syme, 1979; House, Landis & Umberson, 1998) and increased well-being across a wide variety of indicators (Turner, 1981; Siedlecki et al., 2013). Those with higher social support are less likely to develop clinical depression in the wake of a major loss (Brown & Bifulco, 1985); social support from both

parents is a crucial predictor of adjustment for children in the wake of divorce (Sandler, Wolchik & Braver, 1985).

Social support is a “meta-construct” which combines multiple concepts, such as perceived social support (general perceptions of available resources from one’s social network) and received social support (actual supportive behaviors provided by one’s social network; Haber, Cohen, Lucas, & Baltes, 2007). Perceived social support is generally only moderately ( $r$  of approximately 0.35) correlated with received support (Haber, Cohen, Lucas, & Baltes, 2007).

Sarason, Sarason, and Pierce (1995) claim that the social support one derives from a relationship may depend on perceptions of that particular relationship’s warmth, caring, and reciprocity, rather than solely on the actual support behaviors performed by the other person. That is, one’s attitude toward the relationship plays an important role in determining perceived social support. As perceived reality may reflect attitudes toward online relationships as well as online interactions, it is a candidate for influencing perceived social support from online sources.

### **Current Study**

The first study will explore potential connections between perceived reality and perceived online social support. Higher levels of perceived reality may lead to higher levels of perceived online social support, potentially through improving perceptions of relationships that are largely conducted online. Additionally, individuals lower in perceived reality may see the provision of social support over online interactions as less desirable - or even less possible.

*H1:* Increasing perceived reality will increase perceived social support received from online relationships.

Many different variables may influence an individual’s level of perceived reality. Links between personality factors and perceived reality would not be surprising, considering the



openness to experience potentially required to adopt a new communication method or the implications of online interaction for introverts. General attitudes toward the Internet as a whole may also be linked to specific attitudes toward online social interaction.

*RQ1: What contextual factors and individual differences are associated with perceived reality?*

Age or life stage may also play a considerable role. Much of the research on online interactions is done with college undergraduates. While this is a pervasive situation in social psychology, for this particular research area it may be a highly relevant factor. College undergraduates have a wide variety and high quality of face-to-face social interactions available to them, which could result in a devaluing of potentially lower-quality alternatives such as online social interaction. Older individuals, possessing fewer avenues for making new friendships, may not be as quick to dismiss online social interaction. Alternatively, age differences may result in different levels of comfort with and use of the Internet, as well as the salience of different social norms. Older individuals might have more difficulty accepting the idea that an online interaction could be beneficial than those who have grown up with the Internet.

Combining these two perspectives, it is feasible to hypothesize that not only perceived reality but the variables associated with it may differ across samples of different ages and at different points in their lifespans.

*RQ2: Will the variables associated with perceived reality differ between student and non-student samples?*

## CHAPTER 2: Study 1: Method

In order to test the model described above, participants were assigned to one of three conditions varying perceived reality: increased PROI (more positive views of online interactions), decreased PROI (more negative views of online interactions) or control. They then completed multiple survey measures assessing potentially related constructs (such as social support from online relationships and general attitudes towards the Internet) and individual-difference measures (such as personality, social anxiety and loneliness measures).

### Participants

We used two samples: one group of American adults recruited via Amazon Mechanical Turk ( $n = 279$ ) and one of undergraduate college students participating in partial fulfillment of a course requirement ( $n = 135$ ). Both samples were collected in two different stages, but analysis failed to find any significant differences between the two administrations, so the four samples were collapsed into two for all further analysis.

### Amazon Mechanical Turk Sample

The Amazon Mechanical Turk sample was both significantly older than the student sample ( $M = 32.9$ ,  $SD = 12.29$ ;  $t(1,172) = 14.57$ ,  $p < 0.0001$ ) and significantly more variable in age (Levene's test for homogeneity in variance;  $F(167,86) = 140.63$ ,  $p < 0.0001$ ). The sample was 54% female. The majority of participants (69.1%) were Caucasian; the second largest segment (22.6%) of the sample was Asian, followed by 3.6% 'other', 2.4% African-American, 1.2% multi-racial and 1.2% Native American. Hispanic ethnicity was reported by 5.4% of the sample.

## Student Sample

Student participants were on average 19.02 (SD = 1.03) years of age. Concerning gender, 63% of participants were female, 37% male. The majority of participants (70.5%) were Caucasian; the second largest segment (12.5%) of the sample was African-American, followed by 6.9% 'other', 4.5% Asian, 4.5% multiracial, and 1.4% Pacific Islander. Hispanic ethnicity was reported by 12.5% of the sample.

## **Procedure**

All participants completed the study online via Qualtrics. Participants were told that they would be evaluating media reports of scientific research about relationships as a cover story. Depending on condition, the participants read one of three different passages designed to manipulate levels of perceived reality. After reading the passage, participants were informed they would assess it on several dimensions. These instructions were intended to bolster the cover story and induce a careful consideration and reading of the passage. These assessments were also used to examine the quality of the passages.

After reading the passage, participants completed a battery of other materials designed to assess perceived reality, levels and types of Internet use, numbers and types of online relationships, general attitudes toward the Internet, total social support, social support specifically from online relationships, social anxiety and shyness, loneliness, attachment style, personality, and demographics.<sup>1</sup>

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<sup>1</sup> Attachment style did not significantly influence perceived reality or perceived online social support and was included without any potential hypotheses as to its role; therefore, it is not discussed further in this paper.

## **Materials**

All scales included in this experiment were chosen to maximize reliability while minimizing time demand. As such, short forms were used in the place of full scales when prior research suggested that the short forms possessed adequate reliability and predictive value.

### Perceived Reality Manipulation

Participants were assigned to one of three conditions for perceived reality: increased PROI, decreased PROI or control. In all three conditions, participants read a passage that purported to be a media report of upcoming scientific research in the field of relationships. These passages consisted of three paragraphs: two distractor paragraphs, placed first and last, and a middle paragraph that contained the manipulation. The distractor paragraphs concerned 1) roommate relationships and 2) cross-sex friendships. In the control condition, the middle paragraph was simply omitted so that participants only read the distractor paragraphs.

All paragraphs were structured in a similar way: a basic introductory statement to the idea, followed by an assertion about scientific fact. A scientist was quoted explaining his or her results, followed by a recommendation, and closed with a summary statement discussing the state of research as a whole in the relevant area. Following is the paragraph with phrases that differed between the increased and decreased PROI versions enclosed in brackets, with the increased PROI version shown first:

Another hot topic in the field of relationships is online friendships, which are becoming increasingly more common. Ongoing research has shown that friendships conducted over the Internet have a [positive/negative] effect on people. Dr. Mary Cavendish, at the University of Blackpool, has found that online friendships can [raise/lower] people's sense of belonging, their happiness, and their feelings of being socially connected to

others. Dr. Cavendish states: "In the end, Internet friendships are very [similar to/different from] face-to-face friendships. [As long as/Even though] you're spending time with friends, the benefits one gets from the relationship are [just/just not] as substantial." Dr. Sam Bowman of the University of Ontario agrees, saying, "My own findings show that whether someone's friendships are mostly online or offline [doesn't have/has] a big impact on how happy they are." Dr. Cavendish was able to sum up the bottom line in current research for us: "From my research, I would recommend that people try to include [both kinds of/mostly face-to-face] friendships in their life. It's important to feel connected to other people."

### Passage Assessment

Participants were told that they would be assessing the passage that they read on several variables. This assessment was ostensibly the purpose of the study, but was conducted to control for passage quality and to ensure that participants read the passage closely. On a 1-7 scale ranging from 'strongly disagree' to 'strongly agree', participants were asked to what degree they felt the passage was clear, persuasive, trustworthy, informal, well-written, scientific, pleasant, and enjoyable to read. Additionally, participants were asked to explain the main idea of the passage and list any specific thoughts they had had while reading it.

### Perceived Reality Scale

Perceived Reality was measured by the four-item Perceived Reality Scale, which was constructed for this experiment. The scale is as follows:

"Please indicate how much you agree with each of the following statements on a 1-7 scale, with 1 representing 'Strongly disagree' and 7 representing 'Strongly agree'."

1. I feel that online relationships can be as meaningful as relationships conducted face-to-face.
2. I don't think that online communication provides the kind of interactions people need to build close relationships. (reverse-scored)
3. I would be willing to share my deepest hopes and fears in an online relationship.
4. I feel that online relationships can be an important part of someone's social network.

This scale demonstrated acceptable reliability in both Amazon Mechanical Turk (Cronbach's  $\alpha = 0.83$ ) and student ( $\alpha = 0.79$ ) samples.

#### Levels and Types of Internet Use

Participants were asked for the number of hours they spent on the Internet in general. Of these hours, they were asked how many were spent 1) on social activities (such as social networking and instant messaging, etc.); 2) how many were spent on non-social leisure activities (such as shopping, surfing, reading webpages, etc.); 3) how many were spent on work, school or professional activities (business emails, doing homework, research, etc.)

#### Number and Types of Online Relationships

Participants were asked to define the number of online relationships they had that 1) had started in-person and moved online; 2) had started online and moved in-person; 3) had remained entirely online. They were then asked about a separate set of categories: the number of relationships that 4) involved frequent one-on-one communication; 5) involved frequent communication between multiple people (such as forums or support groups); or 6) involved very infrequent (less often than every 2 months) communication.

Online relationships were explicitly defined as "friendships or romantic relationships where the primary method of communication is through the Internet (email, instant messaging, Facebook, message boards/forums, etc.)", excluding text messages as Internet communication.

### General Internet Attitudes

Overall attitudes toward the Internet were measured by Morse, Gullekson, Morris and Popovich's (2011) Attitudes Toward the Internet Scale (Cronbach's  $\alpha = 0.81$  in Amazon Mechanical Turk sample, 0.65 in student sample). This 17-item scale involves three subscales: general Internet usage, negative attitudes toward the Internet, and task facilitation. This scale presents a list of statements and asks participants to rate their agreement on a scale of 1 (*Strongly disagree*) to 7, (*Strongly agree*). Sample items for each subscale include: "I enjoy using the Internet to pass time/have fun"; "I feel anxious that my personal information may be available over the Internet" and "I enjoy shopping online".

### Perceived Social Support

The Duke-UNC Functional Social Support Questionnaire (Broadhead, Gehlbach, deGruy & Kaplan, 1988) was used to measure perceived social support ( $\alpha = 0.88$  in Amazon Mechanical Turk sample,  $\alpha = 0.85$  in student sample). This questionnaire presents a list of facets of social support and asks participants to endorse how much of each facet they receive on a scale of 1 (*As much as I would like*) to 5 (*Much less than I would like*). Therefore, this scale directly measures the extent to which individuals feel their social needs are being met.

To measure perceived social support specifically from online relationships, people were told to consider only their online relationships the first time they filled out the scale. They then completed the scale a second time rating all relationships in total, including online relationships.

### Loneliness

The UCLA Loneliness Scale (8-item version; Hays & DiMatteo, 1987) was used to measure loneliness ( $\alpha = 0.88$  in Amazon Mechanical Turk sample, 0.88 in student sample). On a four-point scale ranging from “Never” to “Often”, participants are asked to endorse how often a certain statement is true for them. An example item is “I lack companionship.”

### Social Anxiety and Shyness

The short form Social Interaction Anxiety Scale (SIAS-6) and Social Phobia Scale (SPS-6; Peters, Sunderland, Andrews, Rapee, & Mattick, 2011) were used to measure social anxiety and shyness ( $\alpha = 0.96$  in Amazon Mechanical Turk sample; 0.85 in student sample). These measures were presented as one twelve-item scale, as suggested by the scale authors. On a five-point scale ranging from “Not at all characteristic or true of me” to “Extremely characteristic or true of me”, participants are asked to endorse how characteristic or true a certain statement is of them. An example item is as follows: “I have difficulty talking with other people.”

### Personality

A short version of the Big Five Inventory (BFI-10; Rammstedt & John, 2007) was used to measure personality traits. This scale included two questions, one reverse-scored, for each of the big five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, neuroticism). On a five-point scale ranging from “Disagree strongly” to “Agree strongly”, participants were asked how well a statement described their personality. An example item is as follows: “I see myself as someone who does a thorough job.” (conscientiousness).



## Demographics

Participants were asked their gender, age, race, Hispanic ethnicity, and educational status. In the undergraduate student population, this was altered to year in school, major, and grade point average.

## Manipulation and Suspicion Checks

In order to ensure that participants had paid attention to the manipulation, several questions relating to suspicion, distraction and recall were included. Participants were asked 1) what they thought the study was about; 2) if they suspected anything they had been told in the study was not true; 3) if they had been distracted during the study; and 4) what the main idea of the paragraph about online relationships was in the passage they had read.

### CHAPTER 3: Study 1: Results

Sixty-eight participants in the Mturk sample were excluded due to failing a manipulation check, one was excluded for self-reported high levels of distraction, eight were excluded for self-reported participation in both administrations of the study, and 33 others were excluded due to failing a suspicion check, for a final sample size of 169 participants. Twenty-one participants in the student sample were excluded due to failing a manipulation check, and 26 participants were excluded due to failing a suspicion check, for a final sample size of 88 participants.<sup>2</sup>

#### Perceived Reality Manipulation

Perceived reality was successfully manipulated in the Amazon Mechanical Turk sample,  $F(2,166) = 6.71, p = 0.002$ , with significant differences between the positive ( $M = 4.48, SD = 1.32$ ) and negative ( $M = 3.90, SD = 1.42$ ) conditions. However, attempts to manipulate perceived reality in the student population were not successful,  $F(2, 85) = 0.62, p = 0.54$ .

In both samples, the passage was rated significantly above the midpoint of the scale on all passage assessments (all  $p$  values  $< 0.05$ ). With the samples combined, the passage scored

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<sup>2</sup> When including all participants, results were largely similar. In the Mechanical Turk sample, differences in perceived reality between conditions dropped to near-significance,  $F(2,274) = 2.21, p = 0.11$ , and perceived social support from online relationships did not differ between conditions. Perceived reality, general Internet attitudes and loneliness remained the only significant predictors of perceived social support from online relationships; however, perceived reality explained more variance ( $\beta = 0.23, t(186) = 5.42, p < 0.0001$ ) than it did in the full sample. In the student sample, the manipulation remained unsuccessful, with perceived reality ( $p = 0.23$ ) and perceived social support from online relationships ( $p = 0.15$ ) not differing between conditions. Perceived reality ( $\beta = 0.27, t(96) = 3.23, p = 0.002$ ) explained the most variance in perceived social support from online relationships, and loneliness became a significant predictor ( $\beta = -0.42, t(96) = -2.00, p = 0.048$ ).

particularly high on clarity ( $M = 6.26$ ,  $SD = 0.96$ ) and quality of writing ( $M = 5.82$ ,  $SD = 1.10$ ), suggesting it was believable as a media report.

Looking at differences between the samples, trust in the passage was significantly lower in the student samples ( $M = 5.20$ ,  $SD = 1.24$ ) than in the Amazon Mechanical Turk sample ( $M = 5.52$ ,  $SD = 1.03$ ),  $F(1,255) = 4.90$ ,  $p < 0.03$ . A similar pattern was observed in ratings of how scientific the passage was; students ( $M = 4.48$ ,  $SD = 1.52$ ) rated the passage as significantly less scientific than Amazon Mechanical Turk participants ( $M = 4.99$ ,  $SD = 1.35$ ),  $F(1, 255) = 7.54$ ,  $p = 0.007$ . No differences were observed between positive, neutral and negative conditions on any assessment.

### **Social Support**

Perceived social support from online relationships did not significantly differ between conditions in either the Amazon Mechanical Turk ( $F(2,160) = 1.03$ ,  $p = 0.36$ ) or the college undergraduate sample ( $F(2, 70) = 1.09$ ,  $p = 0.34$ ).

However, due to the failure of the perceived reality manipulation, a hierarchical multiple regression analysis was also conducted, examining perceived reality, internet attitudes, age, loneliness, social anxiety, hours spent online per week socializing, and number of close online-only friendships as potential predictors of perceived social support from online relationships.

Within the student sample, this model predicted social support from online relationship with marginal significance,  $F(6,56) = 2.11$ ,  $p = 0.067$ . Perceived reality was the only significant predictor of perceived social support from online relationships ( $\beta = 0.44$ ,  $t(56) = 3.14$ ,  $p = 0.003$ ), and perceived reality explained a significant amount of variance in perceived social support from online relationships ( $R^2 = 0.14$ ). The raw correlation between perceived reality and predicted online social support was significant,  $r(69) = 0.29$ ,  $p = 0.01$ .

Within the Amazon Mechanical Turk sample, this model significantly predicted perceived social support from online relationships,  $F(6,126) = 6.47, p < 0.0001; R^2 = 0.24$ . Perceived reality ( $\beta = 0.28, t(126) = 3.22, p = 0.002$ ), internet attitudes ( $\beta = 0.21, t(126) = 2.31, p=0.02$ ), and loneliness ( $\beta = -0.32, t(126) = -3.23, p = 0.002$ ) were all significant predictors of perceived social support from online relationships, together explaining a significant amount of variance ( $sR^2$  for both approximately 0.06). The raw correlation between perceived reality and predicted online social support was significant,  $r(158) = 0.42, p < 0.0001$ .

Therefore, H1 was partially supported; the predicted effects emerged with the measured variable, but not with the manipulated one.

### **Sample Comparisons**

Differences in both average levels of variables and patterns of correlations between variables were observed across this study's two samples. Table 1 lists the means and standard deviations for all variables discussed below.

#### Perceived Reality of Online Interactions

Collapsing across all conditions, the Amazon Mechanical Turk sample was significantly higher in perceived reality than the college student sample,  $t(255) = 7.33, p < 0.0001$ . It is noteworthy that even the negative condition in the Amazon Mechanical Turk sample ( $M = 3.89$ ) demonstrated a higher mean than the student population.

In the Amazon Mechanical Turk population, perceived reality showed a null correlation with all personality traits. However, in the student sample, perceived reality was significantly negatively correlated with extraversion,  $r(88) = -0.22, p = 0.04$ . More introverted students showed higher levels of perceived reality.

### Social Support

Perceived total social support was significantly higher in the student sample than the Amazon Mechanical Turk sample,  $t(231) = -3.63, p < 0.001$ . Conversely, perceived online social support was significantly higher in the Amazon Mechanical Turk sample than in the student sample,  $t(234) = 3.23, p = 0.001$ . This is particularly unexpected as online social support should be a subset of total social support; therefore, increased levels of online social support paired with decreased levels of total social support implies that online support is a larger component of Mechanical Turkers' social networks. Alternatively, it could imply differences in scale usage, such as one sample being more likely to properly include online and offline support.

Additionally, perceived total social support and perceived online social support were significantly positively correlated in the Amazon Mechanical Turk sample,  $r(162) = 0.47, p < 0.0001$ , but uncorrelated in the student sample,  $r(88) = 0.04, p > 0.05$ .

### Social Anxiety and Loneliness

Social anxiety was significantly higher in the Amazon Mechanical Turk sample than in the student sample,  $t(243) = 2.96, p = 0.003$ , as was loneliness,  $t(250) = 2.43, p = 0.02$ .

Interestingly, neither social anxiety,  $r(161) = 0.05, p = 0.51$ , or loneliness,  $r(164) = -0.003, p = 0.97$ , were significantly correlated with perceived reality in the Amazon Mechanical Turk sample. However, in the student sample, perceived reality was significantly correlated with loneliness,  $r(84) = 0.30, p = 0.004$ , and marginally correlated with social anxiety,  $r(83) = 0.18, p = 0.10$ .

### Online Activity

Participants in the Amazon Mechanical Turk sample spent significantly more hours per week online than the student sample,  $t(254) = 3.29, p = 0.0012$ . Breaking down the differences

into specific types of use, Amazon Mechanical Turk participants spent significantly more time using the Internet for work,  $t(247) = 2.58, p = 0.01$ , and leisure activities,  $t(244.8) = 4.70, p < 0.0001$ , but not for social activities,  $t(251) = 0.61, p = 0.73$ .

Time spent online in social activities was also correlated with levels of perceived reality in both the student sample,  $r(86) = 0.31, p = 0.003$ , and the Amazon Mechanical Turk sample,  $r(163) = 0.21, p = 0.007$ .

Amazon Mechanical Turk participants reported significantly more online-only friends than students,  $t(249) = 3.10, p = 0.002$ , with significantly greater variability,  $F(1,164) = 3.54, p < 0.0001$ .

### Internet Attitudes

General attitudes toward the Internet were not significantly different between Amazon Mechanical Turk and student samples,  $t(224.67) = 1.01, p > 0.05$ .

Correlational analysis revealed that general Internet attitudes were significantly correlated with perceived reality in the Amazon Mechanical Turk sample,  $r(165) = 0.38, p < 0.0001$ , but not in the student sample,  $r(84) = 0.09, p > 0.05$ .

## **CHAPTER 4: Study 1: Discussion**

Although the central hypothesis was not entirely supported, the general pattern of results in this study supports a place for the concept of perceived reality of online interactions in the field of computer-mediated communication.

### **Perceived Reality of Online Interactions and Social Support**

H1 stated that increasing perceived reality would increase levels of perceived social support from online relationships. While regression analyses provided some correlational support for this hypothesis, it was not experimentally supported.

One potential reason for this failure could be due to the choice of measure. The Duke-UNC Functional Social Support Questionnaire asks participants to rate their amount of each type of social support relative to their desired amount (“as much as I would like” and “much less than I would like” representing the scale’s anchors). Increasing perceived reality of online relationships could theoretically increase desire for online social support as well as perceptions of it, which would then result in a null effect.

The findings of the regression analyses do speak to perceived reality’s role in online social support above and beyond many other concepts that one might expect to play a predictive role. One potential explanation of the link could be that higher levels of trait perceived reality lead to forming more online friendships, which leads to more social support from online sources. However, neither number of one-on-one close online friendships or time spent online in social activity per week were predictive of online social support with perceived reality in the model.

This provides suggestive evidence that objective amounts of online interaction may not be as relevant as the mindset with which one approaches these online interactions.

### **Manipulation Issues**

Two problems emerged with the manipulation used in this sample: large numbers of participants failing manipulation and suspicion checks, and manipulation failure in the student sample.

In both samples, a large number of participants ( $n = 61$  in Amazon Mechanical Turk;  $n = 12$  in students) were unable to successfully report the main idea of the manipulation paragraph. There were no differences between conditions. The high rate of failure may be due to the length of the study; approximately a half hour on average passed between reading the manipulation and answering the manipulation check. Additionally, it may be due to an overload of information created by the distractor material surrounding the relevant paragraphs.

It is also worth examining why the manipulation succeeded in the Amazon Mechanical Turk sample, yet failed among students. The passage assessment results provide one possible explanation: students saw the passage as less trustworthy and less scientific, and thus were less persuaded. However, this explanation is not entirely convincing, as students still rated the passage significantly above the midpoint of the scale on all dimensions, suggesting they still found it objectively trustworthy and scientific. An alternative explanation is that the passage conflicted with pre-existing low levels of perceived reality, and was therefore unsuccessful; however, participants were dropped as often in the negative condition as in the positive condition. Perhaps the most convincing explanation is that the passage was simply not believed by students, which also dovetails with the large number of participants in the student population dropped due to suspicion.



If the problem is lack of believability, future attempts to use a media report of scientific research for manipulations might benefit from more explicitly scientific detail, such as description of the experiments used to reach the conclusions stated in the article. Multiple participants commented that the lack of such information made it difficult for them to assess the truth of the passage. Such information was not included due to a desire for verisimilitude (media reports are rarely detailed), concerns about length, and potential issues of clarity/difficulty in comprehension.

### **Sample Comparisons**

This research provided preliminary evidence that differences across samples may influence not only the actual levels of perceived reality of online interactions, but also possibly its correlates and effects.

#### Perceived Reality of Online Interactions and Internet Attitudes

Perceived reality demonstrated a significant positive correlation with general attitudes toward the Internet in the Amazon Mechanical Turk sample, but not in the student sample.

One potential explanation for this finding is that Amazon Mechanical Turk participants may be more heavily invested in social use of the Internet than students, and thus are more likely to view the Internet overall through a lens colored by their satisfaction with this social usage. While both groups report socializing for approximately the same amount of time per week online, Amazon Mechanical Turk participants have more solely online friends and higher perceived reality of online interactions. This may imply that the time they spend socializing every week is far more salient and important to them than the students, perhaps due to a relative dearth of offline social connection. This interpretation is reinforced by the finding that Amazon

Mechanical Turk participants have more online social support but less total social support than students.

To test this proposition, an additional analysis looked at the cross-sample correlations between item #16 of the Attitudes Toward the Internet Scale (“I enjoy using the Internet for instant messaging or other types of real-time communication”) and perceived reality. In the Amazon Mechanical Turk sample, this specific item examining attitudes toward online social interaction was no more highly correlated with perceived reality than the overall scale,  $r(163) = 0.35, p < 0.0001$ ). In the student sample, however, this item demonstrated a significant correlation ( $r(86) = 0.31, p = 0.003$ ) with perceived reality that was not shown by the overall scale.

#### Perceived Reality, Social Anxiety, and Loneliness

The correlations between social anxiety, loneliness and perceived reality in the student sample were unsurprising considering previous research; however, the lack of any correlation in the Mechanical Turk sample is surprising indeed. Accessibility of other social avenues may be the most plausible explanation; individuals who turn to online social interaction when alternatives are rich may be more motivated by anxiety than those who utilize online social interaction to make up for a paucity of opportunity in offline social interaction.

#### Generalizability

The sample differences above highlight the potential for markedly different implications for the connections between people’s individual differences and their approach to the Internet. What these data cannot clearly answer is the question of which pattern of results is more generalizable to the population as a whole.

One perspective would consider the Amazon Mechanical Turk population as more generalizable. College students have been labeled as belonging to a poorly-generalizable WEIRD population (Henrich, Heine & Norenzayan, 2010): Western, educated, industrialized, rich and democratic. While Amazon Mechanical Turk participants in this study were still taken from the American population, they are more likely to vary on dimensions such as education, cultural background, and age than a college student sample. Indeed, research suggests that Amazon Mechanical Turk participants are perhaps more representative of the population as a whole than college student samples (Paolacci, Chandler & Ipeirotis, 2010; Buhrmeister, Kwang & Gosling, 2011).

However, Amazon Mechanical Turk is an activity in which most people do not participate. Research suggests that those who do participate are primarily motivated by enjoyment (Paolacci, Chandler & Ipeirotis, 2010; Buhrmeister, Kwang & Gosling, 2011); however, an open question remains as to what individual differences might lead to considering Amazon Mechanical Turk work enjoyable.

Additionally, Amazon Mechanical Turk activity may reflect greater involvement in the Internet. While both samples did not differ on general Internet attitudes, Amazon Mechanical Turk subjects demonstrated significantly higher perceived reality, more time spent on the Internet per week, and a greater number of online-only friends. These figures may represent an average for the population as a large with college students being unusually low, but it is equally possible (and perhaps more likely) that Amazon Mechanical Turkers are unusually high on these variables. High levels of Internet involvement could result in links between the perceived reality of online interactions and other attitudes toward technology that could conceivably affect the outcomes of perceived reality.

## **Conclusions**

While we did not find the full range of predicted effects of perceived reality of online interactions, this study provided preliminary evidence for its value as a construct. It played a role in predicting levels of social support from online relationships above and beyond more objective factors, such as number of hours per week spent socializing and number of online friends.

## CHAPTER 5: Study 2: Introduction

If the perceived reality of online interactions is linked to perceived social support from online social interactions, what are the mechanisms underlying this link? Two pathways are plausible: 1) perceived reality may improve perceptions of online relationships, leading to higher perceived support with no actual change in support behavior; 2) perceived reality may lead to objectively closer and deeper online relationships, increasing the actual support received as well as perceived support. Study 1 has already made the case for perceived reality's effect on perceived social support through more positive perceptions of online relationships; might individuals high in perceived reality be willing to provide more support behaviors online as well?

A direct effect of perceived reality on perceived social support feels intuitive, as perceived reality is defined as more positive perceptions of online interactions; one would expect that perceptions of specific aspects of online relationships, such as their social support, might improve as perceptions of online interactions did. Plausible as this pathway may be, however, it is less interesting than the alternative. If perceived reality increases support behavior as well as perceived support, several further processes are implied for study. Figure 1 in Study 1 explicates a model in which higher levels of perceived reality might lead to higher levels of relationship-building behaviors over CMC, which in turn creates closer relationships, which in turn leads to benefits in well-being. Relationship-building behaviors represent the crucial link in this model, as they show how perceived reality could be translated into outcomes.

Although any relationship-building behavior could theoretically occur in online social interaction as well as face-to-face interaction, this study will focus on social support and self-

disclosure. Whereas Study 1 examined individuals' perceptions of the support that they received from online relationships, Study 2 examines individuals' willingness to provide such support, as well as their willingness to self-disclose.

### **Social Support**

Why might perceived reality influence the provision of online social support? Multiple relationship factors have been shown to influence willingness to provide support (Dunkel-Schetter & Skokan, 1990; Wellman & Wortley, 1990; Iida, Seidman, Shrouf, Fujita & Bolger, 2008). These factors include relationship satisfaction, norms of helping within the specific type of relationship, past histories of support behavior, and the strength of the relationship (defined as Wellman & Wortley as intimacy, the degree to which the relationship is voluntary, and multiple social contexts for interaction within the relationship).

Many of these relationship factors may be influenced by levels of perceived reality. Higher perceived reality would likely go hand-in-hand with higher intimacy in online relationships, as individuals with higher perceived reality endorse the potential of online interactions to be personal, deep, and intimate. Individuals with high perceived reality are also likely to be more satisfied with relationships that include a considerable online component, as they are less likely to devalue online interactions. This satisfaction could lead to greater provision of support. Finally, if higher perceived reality leads to perceptions of online interactions as more similar to offline interactions, norms of helping may be stronger as well.

Considering these factors as a whole, individuals who are high in perceived reality may therefore be more willing to provide social support in online social interactions.

## **Self-Disclosure**

Self-disclosure is another classic component of friendship formation that may be implicated in the outcomes of online social interaction. It is strongly linked to liking; increased self-disclosure increases liking, individuals self-disclose more to those they already like, and they like those to whom they have self-disclosed (Collins & Miller, 1994). Self-disclosure is also linked to intimacy; in fact, self-disclosure is the most commonly offered definition for intimacy (Parks & Floyd, 1996). When people self-disclose to others, the process of disclosure reciprocity increases the likelihood that they will disclose in return; the best predictor of an individual's disclosure in an interaction is the disclosure of their interaction partner. This reciprocal process, where one partner's disclosure may be an answer to the other's, may also serve to demonstrate responsiveness (Berg, 1987). Overall, individuals may both self-disclose intentionally to build friendships and build friendships unintentionally by dint of self-disclosure.

A wealth of literature has studied self-disclosure in online social interaction. Early literature suggested that self-disclosure was more common online than in face-to-face contexts (Joinson, 2003; Suler, 2004). While this point has been supported in some ways, the evidence is not overwhelming. Experimental studies point toward more frequent and deeper self-disclosure online between strangers; survey studies find deeper disclosure in face-to-face contexts between friends (Nguyen, Bin & Campbell, 2012). If the experimental studies are correct, self-disclosure may be more common in online contexts as a method of uncertainty reduction; via increased rates of direct question-asking, online interaction partners obtain information that might otherwise be obscured due to the lack of cues in a computer-mediated interaction (Antheunis, Valkenburg & Peter, 2007; Antheunis, Schouten, Valkenburg, & Peter, 2012; Tidwell & Walther, 2002).

A link between perceived reality and self-disclosure is supported by several potential mechanisms. Individuals high in perceived reality may be more likely to seek intimacy online by self-disclosing, and – as they are interested in relationship formation – more likely to utilize reciprocal self-disclosure to demonstrate responsiveness. Additionally, self-disclosure may simply be more likely in online contexts for all participants, regardless of levels of perceived reality.

### **Positive Outcomes of Affiliative Behaviors**

Should participants both self-disclose and offer social support, what are the expected positive outcomes? In a real-world setting, the most obvious outcome would be the creation of a lasting friendship. However, in a single-interaction setting, it seems unlikely that there will be time for a genuine friendship to grow. It is more likely that the outcomes of a single interaction would be observed in other variables that are typically contributory to relationship formation.

Evidence exists to suggest that self-disclosure's relationship-fostering role may operate through increases in closeness. As discussed earlier, self-disclosure is a major component of intimacy. Additionally, self-disclosure has been shown to increase closeness specifically in online interactions (Peter, Valkenburg & Schouten, 2005) and increased closeness has been implicated in increased well-being (Valkenburg & Peter, 2007).

### **Current Study**

In order to examine these potential mechanisms for perceived reality's effect on the outcomes of online social interactions, an actual online social interaction would be ideal. However, initial evidence for the efficacy of manipulations that attempt to target perceived reality has been inconclusive. Additionally, as perceived reality can be considered an attitude towards online interactions, its effects should be observed in intentions as well as in behavior.



As such, this study utilized a hypothetical interaction scenario. Participants were told they would engage in an interaction with a fellow student. They then reported their willingness to provide social support and to self-disclose during the interaction, and their expected outcomes post-interaction. Participants were assigned to four basic conditions: a condition involving a face-to-face hypothetical interaction and three conditions involving online hypothetical interactions. In the three online conditions, participants were assigned to either a control manipulation or manipulations intended to increase or decrease levels of perceived reality; in the face-to-face condition, all participants received the control manipulation.

**H1:** High levels of perceived reality will increase willingness to provide social support and to self-disclose in the online interaction conditions.

**H2:** High levels of perceived reality will increase expectation of positive outcomes in the online interaction conditions.

**H2A:** This increase will be mediated by willingness to provide social support and to self-disclose.

General negative attitudes toward online interactions, as well as previously observed low levels of perceived reality in college undergraduate populations, raise the possibility of a main effect of interaction medium.

**RQ1:** Will participants report more willingness to provide social support, more willingness to self-disclose, and/or more expectation of positive outcomes in the face-to-face condition?

## CHAPTER 6: Study 2: Method

### Participants

Two hundred and seven college undergraduates participated in this experiment for partial course credit.<sup>3</sup>

### Procedure

Before coming to the lab, participants completed an online pre-survey that measured personality and individual difference factors that might bias the other results if answered alongside describing a future interaction. This included data on computer usage and online friends, social anxiety, and loneliness. Demographics were also administered in the pre-survey.

For the study itself, participants were brought into the lab and assigned to one of four conditions: a face-to-face interaction with a control manipulation of perceived reality or an online interaction with high, control or low manipulations of perceived reality. Additionally, the presentation of the perceived reality scale was counterbalanced to come before or after the questions related to the interaction, for a total of eight conditions.

As a cover story, participants were told that they would engage in an interaction with a fellow student either face-to-face or online, after completing measures to assess their expectations of the interaction. This interaction purportedly involved discussing three questions from the Generating Closeness Task (Aron, Melinat, Aron, Vallone, & Bator, 1997). Participants described how they imagined the interaction would proceed, before completing scales measuring

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<sup>3</sup> Twenty participants failed an attention check assessing the main idea of the passage they read for the manipulation; 23 participants suspected the interaction would not occur. Omitting these participants did not significantly change the results in almost all cases, so the full data set was used in the reported analyses. Where omitting the participants affected the significance of results, it has been footnoted.

willingness to self-disclose, expected similarity and liking of the interaction partner, desire to interact with the partner again, and maximum expected closeness.

At the end of the measures, participants completed a funnel debriefing procedure on their computers. They were then escorted out of the room individually by the experimenter, in order to preserve the cover story that they were being taken to another room to begin their interaction. Once outside of the room, they were given a final debriefing according to a standard template, after which they were dismissed; the experimenter walked a prescribed path down the hallway to simulate the necessary time to settle the student in the second half of the experiment before returning.

## **Materials - Presurvey**

### Perceived Reality Scale

Participants completed an expanded ten-item version of the Perceived Reality Scale described in Study 1 and included in Appendix 1. In order to increase reliability and address all aspects of this construct (e.g., choice of communication medium), six additional questions were added. Participants indicated how much they agreed with each of the statements on a 1-7 scale, with 1 representing ‘Strongly disagree’ and 7 representing ‘Strongly agree’. Sample new questions include “I don’t think you can have a meaningful and deep conversation over the Internet” (reverse-scored) and “Whether I talk to my friends online, on the phone or in person, it’s all the same to me.”

### Social Anxiety and Loneliness

As in Study 1, the UCLA Loneliness Scale (8-item version; Hays & DiMatteo, 1987) was used to measure loneliness and the Social Interaction Anxiety Scale (SIAS-6) and Social Phobia

Scale (SPS-6; Peters, Sunderland, Andrews, Rapee, & Mattick, 2011) was used to measure social anxiety.

### Personality

The Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow & Swann, 2003) was used to measure personality traits.

### Computer Usage

A subset of the computer usage questions described in Study 1 were included in this study, examining time spent on the Internet per week and number of close friends online and offline.

### Demographics

Participants were asked their gender, age, race, year in school, major, and grade point average.

## **Materials – Lab Survey**

### Perceived Reality Manipulation

Participants completed an edited version of the manipulation detailed in Study 1. The manipulation included a longer and more detailed version of a scientific research passage presenting online interactions as beneficial or detrimental, followed by the generation of three reasons that agree with the passage's main statement. The control condition involved a discussion of the benefits of tile flooring versus carpeting. This altered manipulation was pilot tested in a separate Mechanical Turk sample with 96 participants; one participant was dropped for non-compliance with the generation of reasons task. A significant difference in perceived reality between the positive ( $M = 4.53$ ,  $SD = 1.24$ ) and negative ( $M = 3.59$ ,  $SD = 1.18$ ) conditions was observed in the pilot sample,  $F(2, 92) = 6.72$ ,  $p = 0.002$ .

### Passage Assessment

In order to bolster the cover story that the passage was unrelated to the rest of the experiment, participants assessed the passage on several dimensions scored from 1-7, with 1 representing “strongly disagree” and 7 representing “strongly agree”. The passage was rated on clarity, persuasiveness, trustworthiness, formality, writing quality, scientific rigor, pleasantness, and enjoyment.

### Perceived Reality Scale

Participants completed the perceived reality scale in the lab survey as well as the pre-survey. In four conditions, this scale was presented directly after the manipulation; in the other four conditions, it was presented after the Inclusion of Self in Others task.

### Description of the Interaction

After completing the manipulation and (in four conditions) the scale, participants saw the following text: “Thank you for completing the first part of our study! Soon, you’re going to engage in an interaction with another UNC student [over the Internet on your computer/in a different room]. The two of you will talk for about ten minutes, discussing the following series of questions:

1. What would constitute a perfect day for you?
2. Name three things you and your interaction partner seem to have in common.
3. What do you value most in a friendship?

Before you and your partner interact, we’re interested in your thoughts and expectations about this conversation. We would like you to take a few minutes to consider your answers to these questions.”

After considering this information, participants were asked to write about their expectations of the conversation for approximately five minutes. The prompt was as follows:

“Now that you have thought about your own answers, we would like you to describe what you think might happen in this interaction. You can write about the answers to the questions, how you would feel, how smoothly the interaction might go, or anything else that you think would be likely to happen during the interaction.

Try to spend about five minutes describing what you think might happen when you and your partner discuss the questions listed above.”

### Willingness to Self-Disclose

To measure willingness to self-disclose, participants completed a modified version of the Miller Self-Disclosure Index (Miller, Berg, & Archer, 1983). On a scale of 1-5, from “Not at all willing” to “very willing”, participants indicated how willing they would be to talk about a list of eleven topics.

Additionally, participants chose three more questions from a set of nine taken from the Generating Closeness Task to include in the interaction. The nine questions included three from each of the three stages of the task, which is organized to necessitate increasing self-disclosure as one continues. Therefore, the choice of question functioned as a potential secondary measure of willingness to disclose; later questions might imply greater self-disclosure. However, this secondary measure was not utilized in future analyses.<sup>4</sup>

### Willingness to Provide Social Support

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<sup>4</sup> The correlation between this secondary measure and the Miller Self-Disclosure Index was not significant,  $r(206) = 0.12, p > 0.05$ . Additionally, its correlation with social support ( $r(206) = 0.14, p = 0.04$ ) was far lower than the correlation between the Miller Self-Disclosure Index and social support ( $r(206) = 0.41, p < 0.0001$ ). The second measure was not affected by the manipulation of perceived reality,  $F(3,202) = 0.40, p > 0.05$ , and it was uncorrelated with perceived reality,  $r(206) = -0.008, p > 0.05$ .

In lieu of a standard scale, participants were asked to endorse either how much time they would spend on specific helping tasks for their partner (such as providing romantic advice) or their general willingness, on a 1-7 scale, to complete tasks such as sharing class notes, giving their partner rides, or providing advice on class choices and their college career.

### Positive Outcomes

In order to examine potential consequences of the interaction, participants completed several measures of positive affect and expectations about the interaction that were combined in later analysis (Cronbach's alpha = 0.82).

Positive affect and expectations toward the interaction partner were measured by seven questions scored on a 1-7 scale, from "Not at all" to "Very much." These questions assessed expected similarity to and liking of the partner; expected happiness post-interaction; anticipation and anxiety (reverse-scored) toward the interaction; and expected desire/willingness to expend effort to interact with the partner again. Anxiety was discarded from the index due to low correlation with the other items.

Maximum expected closeness post-interaction was measured by the Inclusion of Other in Self Scale (IOS; Aron, Aron & Smollan, 1992) with the instructions edited to read: "Please select the picture below which best represents how close you think you COULD be (at the most) to your interaction partner after your interaction."

### Funnel Debriefing and Attention Checks

At the end of the study, participants completed a series of increasingly detailed suspicion checks, beginning with "What do you think the purpose of this experiment was?" and ending with "Did you suspect the interaction was not going to happen?" Participants then were asked to

indicate the main idea of the passage they read for their manipulation, given four choices: the actual main ideas of the three conditions and “I don’t know.”



## CHAPTER 7: Study 2: Results

### Manipulation of Perceived Reality

Perceived reality was significantly higher in the positive condition ( $M = 3.32$ ,  $SD = 0.99$ ) than the negative condition ( $M = 2.73$ ,  $SD = 1.12$ ;  $F(7,197) = 2.38$ ,  $p = 0.03$ ,  $\eta^2 = 0.08$ ). Neither the positive nor negative condition significantly differed from the control conditions (face-to-face control,  $M = 3.05$ ,  $SD = 0.97$ ; online control,  $M = 2.84$ ,  $SD = 1.12$ ,  $ps > 0.05$ ).

### Medium Analyses

The inclusion of a face-to-face condition in this study allowed for examination of the effects of expected medium. In the full sample, face-to-face and online interactions did not differ on willingness to provide social support, willingness to self-disclose, or expected positive outcomes (all  $ps > 0.05$ ). Comparing only the online interaction control condition to the face-to-face condition, the face-to-face condition ( $M = 3.93$ ,  $SD = 0.88$ ) led to marginally higher levels of expected positive outcomes than the online condition ( $M = 3.61$ ,  $SD = 0.84$ ,  $t(94) = -1.84$ ,  $p = 0.07$ ).

### ANOVA Analyses

Initial analyses included condition and order in a two-way ANOVA to predict willingness to provide social support, willingness to self-disclose, and expected positive outcomes.

#### Willingness to Provide Social Support

No significant differences were observed between any conditions, including order effects, on willingness to provide social support,  $F(7, 205) = 1.52$ ,  $p > 0.05$ .

### Willingness to Self-Disclose

No significant differences were observed between any conditions, including order effects, on willingness to self-disclose,  $F(7, 205) = 1.07, p > 0.05$ .

### Expected Positive Outcomes

Contrary to hypotheses, the online interaction negative condition led to significantly higher expected positive outcomes ( $M = 4.10, SD = 0.79$ ) than the online interaction control condition ( $M = 3.62, SD = 0.84, F(7,191) = 2.29, p = 0.03$ ).

### **Regression Analyses**

In study 1, treating perceived reality as a measured rather than a manipulated variable provided a valuable alternative approach to data analysis. Although manipulation of perceived reality was successful in study 2, the relatively small difference between the groups on the overall scale and the lack of significant results between conditions imply a similar strategy may be of use with this data set as well.

All regression analyses were completed solely with the three online conditions, as perceived reality should have no effect within the face-to-face condition; separate analyses examining the face-to-face condition only ( $n = 51$ ) found no significant effects of perceived reality on any variable of interest (all  $ps > 0.3$ ). This finding confirms that perceived reality does not reflect general beliefs about all relationships, online or offline, but speaks explicitly to online social interaction.

### Willingness to Provide Social Support

Perceived reality, social anxiety, loneliness, gender, and manipulation condition were entered into a multiple linear regression. Perceived reality was the only variable to significantly predict willingness to provide social support,  $b = 0.27, p = 0.002, sr^2 = 0.06$ .

### Willingness to Self-Disclose

Perceived reality, social anxiety, loneliness, gender, and manipulation condition were entered into a multiple linear regression. Perceived reality ( $b = 0.18, p = 0.03, sr^2 = 0.03$ ) and social anxiety ( $b = -0.30, p = 0.003, sr^2 = 0.06$ ) were the only significant predictors.

### Expected Positive Outcomes

As the model utilized in this study included willingness to provide social support and willingness to self-disclose as potential mediators, expected positive outcomes were analyzed in a hierarchical fashion. The initial step in the hierarchical regression analysis included perceived reality, social anxiety, loneliness, and manipulation condition. See Table 3 for full information on coefficients and significance. Perceived reality, social anxiety, and membership in the negative manipulation condition were significant predictors.

When willingness to provide social support and willingness to self-disclose were added to the model, perceived reality was no longer a significant predictor. Willingness to provide social support and willingness to self-disclose were significant predictors. Taken together, these findings imply that the entirety of perceived reality's contribution to expected positive outcomes could be explained via its influence on social support and self-disclosure. Membership in the negative manipulation condition was also a significant predictor of expected positive outcomes, and social anxiety was marginally significant. Overall, the model explained 49% of the variance within expected positive outcomes.

### **Mediation Analysis**

Hypotheses related to mediation were additionally tested by use of the indirect macro in SPSS (Preacher & Hayes, 2008), designed to examine multiple mediation models. This procedure uses bootstrapping to generate confidence intervals around the effects of the proposed

mediators on the dependent variable; should 0 fall outside this interval, a statistically significant mediation effect is observed.

The mediation model tested included willingness to provide social support and willingness to self-disclose as mediators of perceived reality's effect on expected positive outcomes. Social anxiety, due to its repeated significance in analysis, was included as a control variable. The analysis utilized 5000 bootstrapped samples. Figure 2 depicts this model with standardized coefficients included.

For willingness to provide social support, the estimate was 0.087, with a confidence interval ranging from 0.033 to 0.154. For willingness to self-disclose, the estimate was 0.027, with a confidence interval ranging from 0.004 to 0.072. As neither of these confidence intervals include 0, we can conclude that both variables mediated the effect of perceived reality on expected positive outcomes.

A path analysis was also used to examine the fit of the mediation model. Manipulation condition was allowed to affect perceived reality, with perceived reality in turn driving willingness to self-disclose and willingness to provide social support; willingness to provide social support and willingness to self-disclose, along with manipulation condition, predicted expected positive outcomes. The measurement error of social support and self-disclosure were allowed to correlate, as recommended in Preacher and Hayes (2008). Overall model fit was good,  $\chi^2(7) = 5.12, p > 0.05$ ; RMSEA = 0.000 (90% CI = 0.000 – 0.081); CFI = 1.000.

## **CHAPTER 8: Study 2: Discussion**

While the hypothesized results could not be obtained via experimental manipulation of perceived reality, the study's central hypotheses were nonetheless supported via correlational evidence. Levels of perceived reality have a significant effect on expected positive outcomes of an online interaction, an effect which is mediated through willingness to provide social support and willingness to self-disclose; in other terms, individuals high in perceived reality are indeed more willing to perform affiliative behaviors in an online interaction, which in turn increases their expectations of positive outcomes post-interaction. Moreover, these effects held only for online interactions; perceived reality did not influence affiliative behaviors or expectation of positive outcomes in a face-to-face interaction, further confirming its hypothesized role as an attitude toward online interactions.

The success of the manipulation in affecting perceived reality, yet its failure in affecting affiliative behaviors and expected positive outcomes, is an unexpected finding that is open to several different interpretations. Most obviously, the effects of the manipulation on perceived reality were small, with the positive condition only approximately half a scale point higher than the negative condition (on a scale of 1-7) and neither condition significantly differing from the control condition. While the manipulation was statistically significant, its practical significance may have been considerably lower.

Alternatively, it is possible that the effects of perceived reality on affiliative behaviors and expected positive outcomes are not driven by perceived reality itself, but third variables strongly linked to perceived reality, such as history of past online behavior. These hypothetical

third variables would not be influenced by a manipulation that sought to change attitudes, but their effect might be observed in regression analysis if they were highly correlated with perceived reality, as might be expected.

It is also worth acknowledging the hypothetical nature of this interaction. The self-disclosure that participants report may differ noticeably from the self-disclosure recorded by objective observers (Nguyen, Bin & Campbell, 2012). Additional error is likely to be introduced when participants are asked to forecast their own levels of self-disclosure.

Hypotheses about differences between the media (online and face-to-face) were not supported. This finding may serve as further indication that the hypothetical nature of the interaction limited participants' ability to forecast their responses. Prior research has suggested that generally negative attitudes toward online interactions are common, a finding supported by the generally low levels of perceived reality in this sample; however, participants did not express less willingness to self-disclose or to provide social support between conditions, and the difference in expected positive outcomes did not reach significance despite adequate sample size. Alternatively, participants may have simply anticipated that an interaction with a fellow in-group member would be somewhat pleasant, regardless of the medium. As such, since the interaction was simple and not deeply personal, they may have forecasted little difference between face-to-face and online interaction.

While the overall amount of variance explained by the factors within this model was generally robust, the effects of perceived reality were generally minor, explaining only 6% of variance even when willingness to self-disclose and willingness to provide social support were exempted from the model. Considering the difficulty in successfully obtaining results from the

manipulation of perceived reality, a different approach to understanding the outcomes and consequences of online social interaction may be merited.

Affiliative behaviors on their own serve as powerful predictors of expected outcomes; a more valuable approach in future research may focus not on individual differences but situational factors that lead to greater production of affiliative behaviors in online social interaction. Additionally, focus on how affiliative behaviors play out in actual online social interaction may be rewarding; how do the traditional social psychological processes of friendship formation interface with the affordances of new and evolving media? For example, social support in this study was operationalized as willingness to perform concrete tasks or provide advice. Might clicking the ‘like’ button on a friend’s Facebook post be a form of emotional social support, offering validation and approval – and, if so, will it have similar effects on well-being and other outcomes? If perceived support determines consequences, then the value of newer forms of support will vary widely depending on the recipient’s opinion of the media through which the support is offered.

In the end, perception still has an important role to play in understanding online social interaction: even if perceptions of online interactions’ “reality” may not drive behavioral choices, perceptions of online social interactions in general are likely to determine responses to everything that might occur within their context.

Table 1.

*Primary variables compared between Mechanical Turk and student samples.*

Variable	Sample				Comparison t
	<u>Mechanical Turk</u>		<u>Student</u>		
	M	SD	M	SD	
Perceived Reality	4.40	1.44	3.07	1.21	7.33***
Total Social Support	3.92	0.91	4.27	0.60	-3.63***
Online Social Support	3.23	0.93	2.81	0.87	3.23**
Social Anxiety	1.97	0.99	1.66	0.58	2.96**
Loneliness	2.12	0.69	1.90	0.63	2.43*
Total Hours Online	29.11	17.01	21.98	15.40	3.29**
Hours Online – Work	11.92	12.70	8.80	6.40	2.58*
Hours Online – Leisure	8.81	8.04	4.98	4.86	4.70***
Hours Online – Socializing	8.89	9.78	8.14	8.37	0.61
Online-Only Friendships	8.12	18.24	2.66	9.69	3.10**
Internet Attitudes	5.21	0.76	5.13	0.53	0.90

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.0001$ .



Table 2.

*Correlations between Internet attitudes and Big Five personality traits.*

Variable	Sample					
	<u>Mechanical Turk</u>			<u>Student</u>		
	<i>r</i>	<i>p</i>	n	<i>r</i>	<i>p</i>	n
Conscientiousness	0.25	0.0015**	164	-0.06	0.58	84
Agreeableness	0.16	0.04*	164	0.05	0.62	84
Neuroticism	-0.28	0.0002**	165	-0.05	0.67	84
Extraversion	0.15	0.055	165	-0.10	0.37	84
Openness to Experience	0.15	0.053	165	0.05	0.65	84

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.0001$ .

Table 3

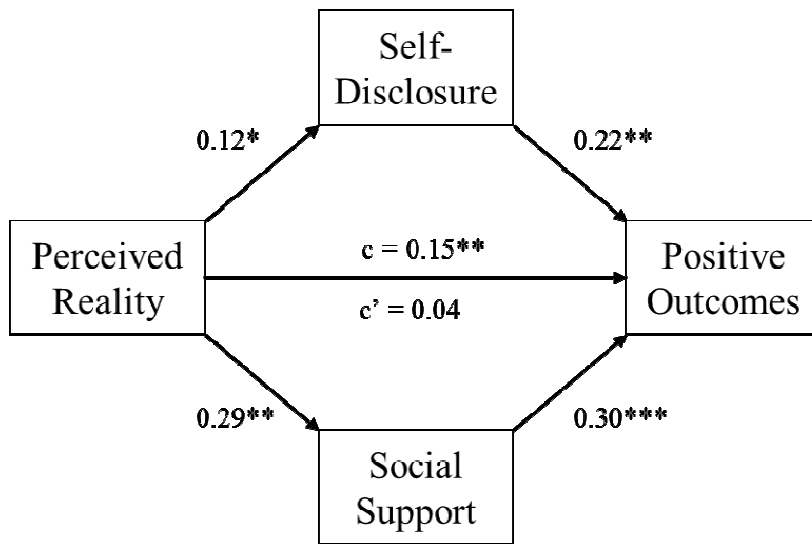
*Regression coefficients for predicting expected positive outcomes.*

Variable	B	$\Delta$	sr2
<i>Step 1: Without mediators</i>			
Perceived Reality	0.19**	0.25**	0.054
Social Anxiety	-0.34*	-0.24*	0.040
Loneliness	-0.07	-0.05	0.002
Positive Manip.	0.10	0.06	0.002
Negative Manip.	0.53**	0.30**	0.070
<i>Step 2: Mediators included</i>			
Perceived Reality	0.05	0.07	0.003
Social Anxiety	-0.21†	-0.15†	0.014
Self-Disclosure	0.33**	0.28**	0.058
Social Support	0.30***	0.43***	0.136
Loneliness	-0.10	-0.07	0.003
Positive Manip.	0.06	0.04	<0.001
Negative Manip.	0.33**	0.19**	0.026

*Note.* \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ ; † =  $p < 0.06$ .  $n = 155$

Figure 2.

*Multiple mediation model for perceived reality's effect on expected positive outcomes.*



*Note.* \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ .

## APPENDIX 1: MATERIALS FOR STUDY 1

### Online Attitudes and Relationships Study Measures

Bold text indicates directions for question blocks/text of individual questions. Information in parentheses explains the sources of instruments used, response choices, and other pertinent information.

#### Table of Contents:

1. Perceived Reality Manipulation
2. Passage Assessment
3. Data on Online Relationships and Internet Usage
4. Internet Attitudes Assessment (Internet Attitudes Scale: Morse, Gullekson, Morris & Popovich, 2011)
5. Perceived Reality Scale
6. Social Support from Online Relationships/All Relationships in Total (Duke-UNC Social Support Questionnaire: Broadhead, Gehlbach, de Gruy and Kaplan, 1988)
7. Social Anxiety and Social Phobia Scales (Social Interaction Anxiety Scale-6 and Social Phobia Scale-6 short forms: Peters, Sutherland, Andrews, Rapee & Mattick, 2011.)
8. Loneliness Scale (UCLA Loneliness Scale-8, short form: Hays & DiMatteo, 1987)
9. Attachment Style Scale (Relationships Questionnaire: Bartholomew & Horowitz, 1991.)
10. Big Five Personality Factor Assessment (Big Five Inventory-10: Rammstedt & John, 2007)
11. Manipulation Check
12. Demographics
13. Hypothesis Awareness

#### **1. Perceived Reality Manipulation**

Thank you for choosing to participate in this study! This study will have two parts: the first is on perception of media reports of science and the second is on different types of relationships.

To complete the first part of the study, please read the following passage carefully. It will be split over three screens for ease of reading. You will be asked to give your reactions to the message, so it's important that you pay very close attention.

For the first part, please read the following passage closely.

Close relationships are an important area of research in the world of social psychology. Whether a relationship is between friends, romantic partners or family, it can help define your life. With the start of a new school year, there's one kind of relationship that's on the minds of college freshmen everywhere: roommates. Most people have heard at least one horror story about living with a completely incompatible person. However, research suggests that it's within our power to improve how we get along with our roommates. Dr. Jennifer Crocker and Amy Canevello, at the University of Michigan, have found that people who are more open and compassionate are more likely to build close, supportive relationships with their roommates. As Dr. Crocker says, "Students can be the architects of their roommate relationships, enhancing or undermining the quality of these important relationships."

*[Participants here see a different second paragraph depending on their condition. The positive condition discusses the benefits of online relationships; the negative discusses the downsides of online relationships; the control condition will skip directly to the third paragraph.]*

**Positive condition:** Another hot topic in the field of relationships is online friendships, which are becoming increasingly more common. Ongoing research has shown that friendships conducted over the Internet have a positive effect on people. Dr. Mary Cavendish, at the University of Blackpool, has found that online friendships can raise people's sense of belonging, their happiness, and their feelings of being socially connected to others. Dr. Cavendish states: "In the end, Internet friendships are very similar to face-to-face friendships. As long as you're spending time with friends, the benefits one gets from the relationship are just as substantial." Dr. Sam Bowman of the University of Ontario agrees, saying, "My own findings show that whether someone's friendships are mostly online or offline doesn't have a big impact on how happy they are." Dr. Cavendish was able to sum up the bottom line in current research for us: "From my research, I would recommend that people try to include both kinds of friendships in their life. It's important to feel connected to other people."

**Negative condition:** Another hot topic in the field of relationships is online friendships, which are becoming increasingly more common. Ongoing research has shown that friendships conducted over the Internet have a negative effect on people. Dr. Mary Cavendish, at the University of Blackpool, has found that online friendships can lower people's sense of belonging, their happiness, and their feelings of being socially connected to others. Dr. Cavendish states: "In the end, Internet friendships are very different from face-to-face friendships. Even though you're spending time with friends, the benefits one gets from the relationship are just not as substantial." Dr. Sam Bowman of the University of Ontario agrees, saying, "My own findings show that whether someone's friendships are mostly online or offline has a big impact on how happy they are." Dr. Cavendish was able to sum up the bottom line in current research for us: "From my research, I would recommend that people try to include mostly face-to-face friendships in their life. It's important to feel connected to other people."

Research has also been increasingly focused on identifying differences between different kinds of friendships. One particular area of interest is same-sex versus cross-sex friendships. Common wisdom suggests that it's difficult for men and women to be friends with each other, but a study recently published in the *Journal of Social and Personal Relationships* confirmed that people are capable of forming truly platonic cross-sex friendships. However, it's often difficult for people to know how to define them. Don O'Meara, a prominent researcher in cross-sex friendships, states "People don't know what feelings are appropriate toward the opposite sex, unless they're what our culture defines as appropriate."

## 2. Passage Assessment

This concludes the passage. Thank you for your careful attention.

Now, we will ask you some questions about the passage that you just read. These questions will list different adjectives that you may agree apply to the passage, or disagree. Please select the option that you feel most closely reflects your opinion.

Low values (on the left) represent that you think the word does NOT apply to the passage, and high values (on the right) represent that you think the word does apply to the passage.

I feel that the passage I just read was...

	Strongly Disagree			Strongly Agree			
	1	2	3	4	5	6	7
Clear	1	2	3	4	5	6	7
Persuasive	1	2	3	4	5	6	7
Trustworthy	1	2	3	4	5	6	7
Informal	1	2	3	4	5	6	7
Well-Written	1	2	3	4	5	6	7
Scientific	1	2	3	4	5	6	7
Pleasant	1	2	3	4	5	6	7
Enjoyable to read	1	2	3	4	5	6	7

Please briefly explain the main ideas of the passage: (Open-ended response)

In the space below, please take a minute or two to list all of the thoughts you had when you were reading the material. Don't worry about spelling or grammar—just write down all the thoughts you can recall. These thoughts may be positive, negative, or neutral toward the material. (Open-ended response)

### **3. Data on Online Relationships and Internet Usage**

Thank you for completing the first part of the study!

In this study, we are also interested in several different kinds of relationships. You have been chosen to answer some questions on ONLINE relationships.

For our purposes, online relationships can be defined as "friendships or romantic relationships where the primary method of communication is through the Internet (email, instant messaging, Facebook, message boards/forums, etc.)" Do NOT include text messaging as a method of Internet communication.

Keeping the above guidelines in mind, how many online relationships do you currently have where...

The relationship primarily involves frequent 1-on-1 communication (instant messages, emails, other forms of private messages, etc.)? (open-ended response)

The relationship primarily involves frequent communication within a group (a support group, a group of 'regulars' on a forum, commenting on status updates, fellow players of a game, etc.)? Count the group as a single relationship, but any individual relationships with group members that are mostly on a 1-on-1 basis in the above question. (open-ended response)

The relationship involves infrequent (less than once every 2 months) communication? (open-ended response)

What number and percentage (rough answers are acceptable) of your online relationships: (open-ended responses)

Started online but have included meeting in person since?

Started in person but have moved online since?

Started online and have remained entirely online?

Please describe your three closest online relationships. It's fine to include individuals or groups – just use whichever relationships you feel are closest to you. Include such information as what you and your friends talk about, the benefits you feel you gain from the relationship, and

anything else you think would be important to help us understand your relationships. (Open-ended response)

How many hours do you spend on the Internet per week, on average? (open-ended response)

Of those hours, how many are spent: (open-ended responses)

On social activities (instant messaging, social networks, etc?)

On non-social leisure activities (shopping, surfing, reading webpages, etc.?)

On work, school or professional activities (business emails, doing homework/research, etc?)

#### **4. Internet Attitudes Scale**

Please answer the following questions on a scale of 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agree.

1. I enjoy shopping online.
2. I enjoy browsing (surfing) websites without any specific purpose.
3. I feel anxious that online communications can potentially be seen, heard, or otherwise accessed by other people.
4. I feel that the Internet limits my productivity.
5. I feel that the Internet has allowed me to keep in touch with many people.
6. I feel anxious that my personal information may be available over the Internet.
7. I like to look up information about businesses, services, and/or products on the Internet.
8. I have had more good experiences than bad experiences using the Internet.
9. I would prefer to communicate through writing a letter or a memo rather than an email.
10. I feel uncomfortable using my credit card online.
11. I enjoy using the Internet to pass time and/or to have fun.
12. I would prefer to go online to conduct most of my banking.
13. When searching for information, I would rather read books, magazines, and newspapers than browse the Internet.



- 14. I only feel comfortable using online stores to browse or compare prices.
- 15. I avoid using the Internet whenever possible.
- 16. I enjoy using the Internet for instant messaging or other types of realtime communication.
- 17. Overall, I enjoy using the Internet.

**5. Perceived Reality Scale**

Please answer the following questions on a scale of 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agree.

- 1. I feel that online relationships can be as meaningful as relationships conducted face-to-face.
- 2. If I only spoke to someone online, I wouldn't consider them a close friend. (reverse-scored)
- 3. I would be willing to share my deepest hopes and fears in an online relationship.
- 4. I feel that online relationships can be an important part of someone's social network.
- 5. I don't think that online communication provides the kind of interactions people need to build close relationships. (reverse-scored)
- 6. I would only feel comfortable talking about certain topics with online friends. (reverse-scored)

**6. Social Support from Online Relationships/All Relationships in Total**

Here is a list of some things that other people do for us or give us that may be helpful or supportive. Please read each statement carefully and place a check in the blank that is closest to your situation.

From JUST my online relationships, I get...

	As much as I would like	. . . . .	Much less than I would like
1. people who care what happens to me		. . . . .	
	As much as I would like	. . . . .	Much less than I would like
2. love and affection		. . . . .	

3. chances to talk to someone about problems at work or with my housework

As much as I would like	Much less than I would like
_____	_____

4. chances to talk to someone I trust about my personal and family problems

As much as I would like	Much less than I would like
_____	_____

5. chances to talk about money matters

As much as I would like	Much less than I would like
_____	_____

6. invitations to go out and do things with other people

As much as I would like	Much less than I would like
_____	_____

7. useful advice about important things in life

As much as I would like	Much less than I would like
_____	_____

8. help when I'm sick in bed

As much as I would like	Much less than I would like
_____	_____

**From ALL of my relationships in total, including my online relationships, I get...**

1. people who care what happens to me

As much as I would like	Much less than I would like
_____	_____

2. love and affection

As much as I would like	Much less than I would like
_____	_____

As much as	Much less than I
------------	---------------------

3. chances to talk to someone about problems at work or with my housework	I would like .....	would like
4. chances to talk to someone I trust about my personal and family problems	As much as I would like .....	Much less than I would like
5. chances to talk about money matters	As much as I would like .....	Much less than I would like
6. invitations to go out and do things with other people	As much as I would like .....	Much less than I would like
7. useful advice about important things in life	As much as I would like .....	Much less than I would like
8. help when I'm sick in bed	As much as I would like .....	Much less than I would like

**7. Social Anxiety and Social Phobia Scales**

For each question, please choose an answer to indicate the degree to which you feel the statement is characteristic or true of you. (Options: Not at all true of me, Slightly true of me, Moderately true of me, Very true of me, Extremely true of me.)

1. I have difficulty making eye contact with others.
2. I find it difficult mixing comfortably with the people I work with.
3. I tense up if I meet an acquaintance on the street.
4. I feel tense if I am alone with just one person.
5. I have difficulty talking with other people.
6. I find it difficult to disagree with another's point of view.

7. I get nervous that people are staring at me as I walk down the street.
8. I worry about shaking or trembling when I'm watched by other people.
9. I would get tense if I had to sit facing other people on a bus or train.
10. I worry I might do something to attract the attention of other people.
11. When in an elevator, I am tense if people look at me.
12. I can feel conspicuous standing in a line.

### 8. Loneliness Scale

Please answer the following questions with an answer that indicates how OFTEN you feel the way described in the question.

	Never	Rarely	Sometimes	Often
	1	2	3	4
I lack companionship.	1	2	3	4
There is no one I can turn to.	1	2	3	4
I am an outgoing person.	1	2	3	4
I feel left out.	1	2	3	4
I feel isolated from others.	1	2	3	4
I can find companionship when I want it.	1	2	3	4
I am unhappy being so withdrawn.	1	2	3	4
People are around me but not with me.	1	2	3	4

### 9. Attachment Style Scale

Following are descriptions of four general relationship styles that people often report.

Please read each description and choose the letter corresponding to the style that best describes you or is closest to the way you generally are in your close relationships.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

(Multiple-choice; participants choose A, B, C or D).

Please rate each of the following relationship styles according to the extent to which you think each description corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

	Not at all like me		Somewhat like me			Very much like me	
Style A	1	2	3	4	5	6	7
Style B	1	2	3	4	5	6	7
Style C	1	2	3	4	5	6	7
Style D	1	2	3	4	5	6	7

## 10. Big Five Personality Factor Assessment

I see myself as someone who ...

(Options: Disagree strongly, Disagree a little, Neither agree nor disagree, Agree a little, Agree strongly)

- ... is reserved
- ... is generally trusting
- ... tends to be lazy
- ... is relaxed, handles stress well
- ... has few artistic interests
- ... is outgoing, sociable
- ... tends to find fault with others
- ... does a thorough job
- ... gets nervous easily
- ... has an active imagination

## 11. Manipulation Check

**At the beginning of this study, you read a passage that may have dealt with online relationships. What did this passage say about online relationships?**

(Multiple-choice)

- A. They have positive impacts
- B. They have negative impacts
- C. The passage didn't talk about online relationships
- D. I don't remember

## 12. Demographics

All of your responses today are confidential, but it is helpful for us to know something about the kinds of people who are participating in our studies.

What is your gender? (M/F)

What is your age? (open-ended response)

What is your race? Select all that apply: (American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White; Other )

Are you Hispanic or Latino? (Y/N)

(For MTurk Sample only) What is the highest level of education you have completed?

(Less than high school; High school graduate/GED; Some college; Associate's degree; Bachelor's degree; Some graduate/professional school; Graduate or professional degree; Other (please specify) )

(For MTurk sample only) Are you currently enrolled in an undergraduate program? (Y/N)

(For college students) What is your year in school? (Freshman/Sophomore/Junior/Senior/Other)

(For college students) What is your current GPA? If you are a freshman, use your high school GPA. (Open-ended)

(For college students) What is your major? (Open-ended)

## 13. Hypothesis Awareness

Do you think anything you were told in this study is not true? If not, write no. (Open-ended)

What do you think this study was about? (Open-ended)

Do you have any comments about this study? If not, write no. (Open-ended)

(For MTurk participants only) When you were completing this study, were you in a place where you could concentrate easily on the material, or were there distractions (noise, other people, etc.) in your environment?

(I could easily concentrate/The environment was somewhat distracting/The environment was very distracting)



## **APPENDIX 2: MATERIALS FOR STUDY 2**

### **Initial Survey:**

1. Personality
2. Perceived Reality Scale (Initial)
3. Computer Usage and Friends
4. Social Anxiety
5. Attachment Style
6. Loneliness
7. Demographics

### **In-Lab Procedure:**

8. Perceived Reality Manipulation
9. Passage Ratings
10. Perceived Reality Scale
11. Description of Interaction
12. Willingness to Self-Disclose
13. Additional Interaction Questions
14. Inclusion of Self in Others
15. Funnel Debriefing

**(Before participants come to the lab, the following materials will be offered in an online survey.)**

**1. Personality (Big Five)**

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

---

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

---

I see myself as:

1. \_\_\_\_ Extraverted, enthusiastic.
2. \_\_\_\_ Critical, quarrelsome.
3. \_\_\_\_ Dependable, self-disciplined.
4. \_\_\_\_ Anxious, easily upset.
5. \_\_\_\_ Open to new experiences, complex.
6. \_\_\_\_ Reserved, quiet.
7. \_\_\_\_ Sympathetic, warm.
8. \_\_\_\_ Disorganized, careless.
9. \_\_\_\_ Calm, emotionally stable.
10. \_\_\_\_ Conventional, uncreative.

**2. Perceived Reality Scale (Initial Administration)**

Please indicate how much you agree with each of the following statements on a 1-7 scale, with 1 representing ‘Strongly disagree’ and 7 representing ‘Strongly agree’.

5. I feel that online relationships can be as meaningful as relationships conducted face-to-face.
6. I would be willing to share my deepest hopes and fears in an online relationship.
7. I don’t think that online relationships can be an important part of someone’s social network.

8. I don't think that I could consider somebody I knew only over the Internet a close friend.
9. I think online relationships can be just as "real" as face-to-face relationships.
10. When I want to talk about something meaningful with someone, I'd much rather call or visit them than talk to them online.
11. I don't think you can have a meaningful and deep conversation over the Internet.
12. I don't think that online communication provides the kind of interactions people need to build close relationships.
13. Whether I talk to my friends online, on the phone or in person, it's all the same to me.
14. I think online interactions can be just as "real" as face-to-face interactions.

### **3. Computer Usage and Friends**

1. How many hours do you spend on the Internet per week, on average?
2. Of those hours, how many are spent:
  - On social activities (instant messaging, social networks, etc?)
  - On non-social leisure activities (shopping, surfing, reading webpages, etc.?)
  - On work, school or professional activities (business emails, doing homework/research, etc?)
3. How many close friends do you have that you only interact with online?
4. How many close friends do you have that you interact both online and in person?
5. How many close friends do you have that you rarely interact with online?
6. Thinking about your three closest friends, what percentage of your meaningful interactions with them are online? (Instant messaging, email, Facebook, etc.)

#### **4. Social Anxiety**

For each question, please choose an answer to indicate the degree to which you feel the statement is characteristic or true of you. (Options: Not at all true of me, Slightly true of me, Moderately true of me, Very true of me, Extremely true of me.)

1. I have difficulty making eye contact with others.
2. I find it difficult mixing comfortably with the people I work with.
3. I tense up if I meet an acquaintance on the street.
4. I feel tense if I am alone with just one person.
5. I have difficulty talking with other people.
6. I find it difficult to disagree with another's point of view.
7. I get nervous that people are staring at me as I walk down the street.
8. I worry about shaking or trembling when I'm watched by other people.
9. I would get tense if I had to sit facing other people on a bus or train.
10. I worry I might do something to attract the attention of other people.
11. When in an elevator, I am tense if people look at me.
12. I can feel conspicuous standing in a line.

#### **5. Attachment Style**

Following are descriptions of four general relationship styles that people often report.

Please read each description and choose the letter corresponding to the style that best describes you or is closest to the way you generally are in your close relationships.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

(Multiple-choice; participants choose A, B, C or D).

Please rate each of the following relationship styles according to the extent to which you think each description corresponds to your general relationship style.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

	Not at all like me		Somewhat like me			Very much like me	
	1	2	3	4	5	6	7
Style A	1	2	3	4	5	6	7
Style B	1	2	3	4	5	6	7
Style C	1	2	3	4	5	6	7
Style D	1	2	3	4	5	6	7

## 6. Loneliness

Please answer the following questions with an answer that indicates how OFTEN you feel the way described in the question.

	Never	Rarely	Sometimes	Often
	1	2	3	4
I lack companionship.	1	2	3	4
There is no one I can turn to.	1	2	3	4
I am an outgoing person.	1	2	3	4
I feel left out.	1	2	3	4
I feel isolated from others.	1	2	3	4
I can find companionship when I want it.	1	2	3	4
I am unhappy being so withdrawn.	1	2	3	4
People are around me but not with me.	1	2	3	4

## 7. Demographics

1. What is your gender? (Male/female)
2. What is your age?
3. What is your year in school?
4. What is your race? Select all that apply: (American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White; Other )
5. Are you Hispanic or Latino? (Y/N)
6. What is your GPA? (open-ended response)
7. What is your 5-digit participant pool ID? It is crucial that you answer this item correctly, so we can certain that you have completed both portions of this study. If you are unsure, please double-check in the Sona System.

**(The remaining measures will be completed on a computer when the participant comes to the lab).**

Thank you for participating in our survey!

Please input your 5-digit participant pool ID. It is crucial that you enter it correctly so that you can get full credit for the study. Remember, your participant pool ID is not linked to your name, so your responses will remain anonymous. (Open answer)

What is your gender? (M/F)

*(New Screen.)*

## **8. Perceived Reality Manipulation**

Before we begin the main study, we would like you to complete a task that will help us choose materials to use for future research. You will read a passage explaining two topics and then rate the passage on some of its qualities. Please read the passage closely so that your impressions will be as accurate as possible!

*(New Screen. Participants in the positive and negative conditions see the following):*

Close relationships are an important area of research in the world of social psychology. Whether a relationship is between friends, romantic partners or family, it can help define your life. However, we can sometimes end up in relationships with people that we didn't choose, such as coworkers or roommates. These people can be very different from us. How can we make the most of these relationships?

Most people have heard at least one horror story about living with a completely incompatible person. However, research suggests that it's within our power to improve how we get along with our roommates. Dr. Jennifer Crocker and Amy Canevello, at the University of Michigan, have found that people who are more open and compassionate are more likely to build close, supportive relationships with their roommates. Active attempts to be a good roommate tend to lead to better responses from one's roommate in return.

As Dr. Crocker says, to summarize her results overall: "Students can be the architects of their roommate relationships, enhancing or undermining the quality of these important relationships."

*(New Screen. Participants will see either the positive, negative or control texts):*

Positive:

In the early days of the Internet, online communication consisted only of email and chatrooms. Now, however, there is a wide range of options that people can use to keep in touch,

such as Facebook, Twitter, multiplayer games and websites. These new communication media foster increasing amounts of online social interaction, which has in turn become a hot topic for study. Recent scientific results have shown that interactions over the Internet, whether with people you've met in person or not, can have a positive effect on people.

Dr. Mary Anderson at Stanford University has found that online friendships can raise college students' sense of belonging, their happiness, and their feelings of being socially connected to others – similar outcomes to those observed in face-to-face friendships. Dr. Anderson states: "In the end, what matters for people's well-being is making real connections. Deep, quality friendships can happen over the Internet too."

Dr. Sam Bowman of the University of Ontario agrees. His research has looked at comparing the outcomes of online and face-to-face interactions, finding that spending time with others is beneficial regardless of the medium. Dr. Bowman explains: "My findings show that whether someone's spending time with friends mostly online or offline doesn't have a big impact on how happy they are."

Dr. Anderson summed up the bottom line in current research for us: "Face-to-face contact will always be important, but online interactions and friendships can provide real benefits for people who engage in them as well. It's important to feel connected to others."

*(New screen.)*

To help understand how people think about research articles, we are asking people to give some thoughts and ideas about one of the topics you read about. Your topic is online interactions.

We would like you to list three reasons why online interactions can be beneficial in similar ways to face-to-face interactions. For example: "You can share important news with friends, even if they're far away."

- 1.
- 2.
- 3.

---

Negative:

In the early days of the Internet, online communication consisted only of email and chatrooms. Now, however, there is a wide range of options that people can use to keep in touch, such as Facebook, Twitter, multiplayer games and websites. These new communication media foster increasing amounts of online social interaction, which has in turn become a hot topic for study.



Recent scientific results have shown that interactions over the Internet, whether with people you've met in person or not, can have a negative effect on people.

Dr. Mary Anderson at Stanford University has found that online friendships don't raise college students' sense of belonging, their happiness, or their feelings of being socially connected to others –the normal positive outcomes observed in face-to-face friendships. Dr. Anderson states: "In the end, what matters for people's well-being is making real connections. Deep, quality friendships don't seem to happen over the Internet."

Dr. Sam Bowman of the University of Ontario agrees. His research has looked at comparing the outcomes of online and face-to-face interactions, finding that spending time with others isn't very beneficial in an online context. Dr. Bowman explains: "My findings show that whether someone's spending time with friends mostly online or offline has a big impact on how happy they are."

Dr. Anderson summed up the bottom line in current research for us: "Face-to-face contact will always be important, as online interactions and friendships don't seem to provide real benefits for people who engage in them. It's important to feel connected to others."

*(New screen.)*

To help understand how people think about research articles, we are asking people to give some thoughts and ideas about one of the topics you read about. Your topic is online interactions.

We would like you to list three reasons why online interactions aren't as beneficial as face-to-face interactions. For example: "You aren't there with your friend in person to give them a hug."

- 1.
- 2.
- 3.

---

Control:

When choosing the proper flooring for your home, there are many different options, such as tile floors, linoleum or carpeting. People have varying opinions about the best choice, as many factors are involved in the decision. Sometimes, situational factors like location may do a lot to determine the best choice for flooring in any given home. However, there are several arguments to be made in favor of tile floors that suggest that they may be superior for most people in most circumstances.

Aesthetics, of course, are one of the primary concerns when choosing flooring. Tile can be bought and laid in many different colors and patterns, creating a highly customizable appearance. Carpet, on the other hand, is usually laid down in a single color or pattern within any given room. This doesn't give a designer as many options when it comes to home décor.

These kinds of questions, concerning décor and design, are subjective; many people might prefer a single, plain color for their flooring, after all. However, more objective factors may also be a large part of the decision. For example, price is another important issue. Typically, carpet is cheaper than tile flooring, though in both cases it depends on the quality of the material used. Carpet is also typically less difficult to install.

On the other hand, tile floors can be far easier to maintain. Liquid spills such as red wine or ketchup that could permanently stain a carpet come clean effortlessly from a tile floor. Carpet is similarly problematic for individuals with allergies, as allergens such as pet fur and dust can be difficult to remove. In hot climates, tile carpeting remains pleasantly cool in the summer.

The correct choice, between tile floors or carpeting, will ultimately depend on the specific house under consideration. Although tile may be better for more people, carpeting and tile floors are both useful in different situations.

*(New screen).*

To help understand how people think about research articles, we are asking people to give some thoughts and ideas about one of the topics you read about. Your topic is tile versus carpet flooring.

Now, we would like you to list three ways in which tile flooring could be better than carpeting.

- 1.
- 2.
- 3.

---

## 9. Passage Assessment

Now, we will ask you some questions about the passage that you just read. These questions will list different adjectives that you may agree apply to the passage, or disagree. Please select the option that you feel most closely reflects your opinion.

Low values (on the left) represent that you think the word does NOT apply to the passage, and high values (on the right) represent that you think the word does apply to the passage.

I feel that the passage I just read was...

	Strongly Disagree			Strongly Agree			
Clear	1	2	3	4	5	6	7
Persuasive	1	2	3	4	5	6	7
Trustworthy	1	2	3	4	5	6	7
Informal	1	2	3	4	5	6	7
Well-Written	1	2	3	4	5	6	7
Scientific	1	2	3	4	5	6	7
Pleasant	1	2	3	4	5	6	7
Enjoyable to read	1	2	3	4	5	6	7

Please briefly explain the main ideas of the passage:

*(Open-ended response)*

In the space below, please take a minute or two to list all of the thoughts you had when you were reading the material. Don't worry about spelling or grammar—just write down all the thoughts you can recall, whatever they were.

*(Open-ended response)*

### 10. Perceived Reality Scale

*(This will be presented here half of the time. The other half of the time, it will be presented after the Inclusion of Self in Others task.)*

[Intro text (for positive and negative conditions only) when PR is presented directly after the manipulation: Sometimes, people's attitudes affect they react to material that they read. In order to account for this kind of influence, please complete the following scale. ]

Please indicate how much you agree with each of the following statements on a 1-7 scale, with 1 representing 'Strongly disagree' and 7 representing 'Strongly agree'.

1. I feel that online relationships can be as meaningful as relationships conducted face-to-face.

2. I would be willing to share my deepest hopes and fears in an online relationship.
3. I don't think that online relationships can be an important part of someone's social network.
4. I don't think that I could consider somebody I knew only over the Internet a close friend.
5. I think online relationships can be just as "real" as face-to-face relationships.
6. When I want to talk about something meaningful with someone, I'd much rather call or visit them than talk to them online.
7. I don't think you can have a meaningful and deep conversation over the Internet.
8. I don't think that online communication provides the kind of interactions people need to build close relationships.
9. Whether I talk to my friends online, on the phone or in person, it's all the same to me.
10. I think online interactions can be just as "real" as face-to-face interactions.

(New screen)

11. (Filler question) I think that people are able to create a good relationship with anyone if they try hard.
12. (Filler question) Some people just can't get along, no matter how hard they try.
13. (Filler question) It's possible to live with somebody you don't agree with on big issues if everyone involved is respectful.
14. (Filler question) I don't think I could live with somebody who wasn't similar to me in important areas.
15. (Filler question) I enjoy having roommates, rather than living alone.

### **11. Description of Interaction**

Thank you for helping us test our materials for future research! This portion of the session is now complete, and you will now begin the main study.

(New screen)

Soon, you're going to engage in an interaction with another UNC student [over the Internet on your computer/in a different room]. The two of you will talk for about ten minutes, discussing the following series of questions:

4. What would constitute a perfect day for you?

5. What do you value most in a friendship?
6. For what in your life do you feel most grateful?

(New screen)

You will be speaking with [Megan/Mike (gender-matched)] a fellow student, once both of you complete the initial part of this study.

Before you and your partner interact, we're interested in your thoughts and expectations about this conversation. We would like you to take a few minutes to consider your answers to the questions:

1. What would constitute a perfect day for you?
2. What do you value most in a friendship?
3. For what in your life do you feel most grateful?

When you feel like you're ready, please go to the next page.

(New screen)

Now that you have thought about your own answers, we would like you to describe what you think might happen in this interaction. You can write about the answers to the questions, how you would feel, how smoothly the interaction might go, or anything else that you think would be likely to happen during the interaction.

Try to spend about five minutes describing what you think might happen when you and your partner discuss the questions listed above.

As a reminder, the questions are:

1. What would constitute a perfect day for you?
2. What do you value most in a friendship?
3. For what in your life do you feel most grateful?

(Open-ended answer text box.)

**12. Willingness to self-disclose – a modified version of the Miller Self-Disclosure Index (Miller, Berg, & Archer 1983).**

How willing would you be to talk to your interaction partner about the following topics?

(Scale of 1-5; Not at all willing ... Very willing)–

1. My personal habits
2. Things I have done which I feel guilty about

3. Things I wouldn't do in public
4. My deepest feelings
5. What I like about myself
6. What I dislike about myself
7. What is important to me in life
8. What makes me the person I am
9. My worst fear
10. Things I am proud of
11. My close relationships with other people

We are interested in possibly expanding this discussion task to include six questions/topics, rather than three. If you could choose three more topics to discuss with your partner beyond the initial three, which would you choose? Please select your **THREE** favorite choices from the following list of nine.

1. Given the choice of anyone in the world, whom would you want as a dinner guest?
2. If you were able to live to the age of 90 and retain either the mind or the body of a 30-year-old for the last sixty years of your life, which would you want?
3. If you could wake up tomorrow having gained any one quality or ability, what would it be?
4. If a crystal ball could tell you the truth about yourself, your life, the future or anything else, what would you want to know?
5. If you knew that in one year you would die suddenly, would you change anything about the way you are now living? Why?

6. How close and warm is your family? Do you feel your childhood was happier than most other people's?
7. Complete this sentence: "I wish I had someone with whom I could share..."
8. What, if anything, is too serious to be joked about?
9. Your house, containing everything you own, catches fire. After saving your loved ones and pets, you have time to safely make a final dash to save any one item. What would it be?

We are also thinking about including one of the following questions as a conversation starter. Please indicate which of the two you would prefer to discuss in your interaction.

1. What are three ways in which you and your partner might be similar?
2. What are three ways in which you and your partner might be unique?

### 13. Additional Interaction Questions

The following questions concern your expectations of your interaction partner and how you'll view them during the interaction. Please answer them on a scale of 1-7, with 1 indicating "Not at all" and 7 indicating "Very much".

1. How similar do you think you will be to your interaction partner?
2. How much do you think you will like your interaction partner?
3. How much are you looking forward to the interaction with your partner?
4. How anxious do you feel about the interaction with your partner?

(New screen)

The following questions concern how you think you'll view your interaction partner after the interaction. Again, please answer them on a scale of 1-7, with 1 indicating "Not at all" and 7 indicating "Very much".

1. After the interaction, how much do you think you will want to speak with your partner again?
2. After the interaction, how willing would you be to make an effort to speak to your partner again?

3. After the interaction, how happy do you think you will feel?

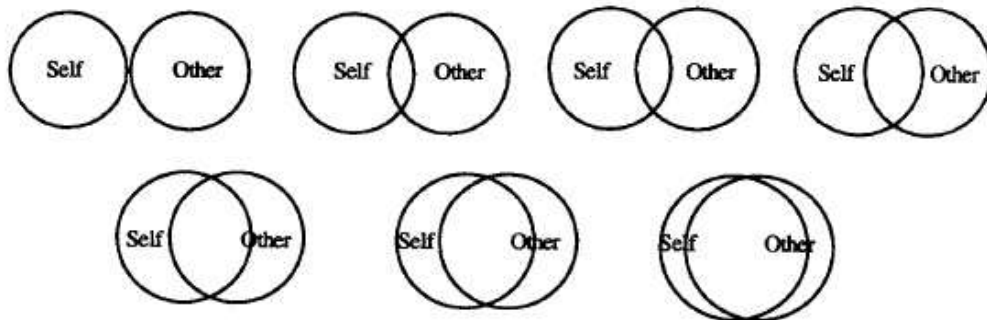
(New screen)

The following questions concern how willing you'd be to do various favors for your interaction partner after the interaction.

1. How willing would you be to share class notes with your interaction partner after a missed class? (1-7 scale, Not at all to Completely)
2. (Assuming you had a car) How willing would you be to drive your interaction partner somewhere they needed to go?
3. How willing would you be to give your interaction partner advice on useful classes to take within your major?
4. How willing would you be to accompany your interaction partner to a stressful situation, such as a trip to the doctor's?
5. How much time would you be willing to spend helping your interaction partner by filling out a survey? (Open-ended answer in minutes)
6. How much time would you be willing to spend giving your interaction partner romantic advice? (Open-ended answer in minutes)

#### 14. Inclusion of Self in Others

Please select the picture below which best represents how close you think you COULD be (at the most) to your interaction partner after your interaction.



This completes the written portion of this task. Please raise your hand and let the experimenter know that you're done so we can escort you down the hall to begin the interaction.



## 16. Funnel Debriefing

1. What do you think the purpose of this experiment was?
2. Did you think that any of the tasks you did were related in any way?  
(if "yes") In what way were they related?
3. Did anything you did on one task affect what you did on any other task?  
(if "yes") How exactly did it affect you?
4. Did anything about today's study seem strange or unusual?
5. Did you suspect anything you were told in today's study was not true?
6. Where did you think your interaction partner was while you were doing the study?
7. Did you suspect that the interaction was not going to happen?
8. What was the topic of the passage you read and rated? (Multiple choice)
  - A. Roommate relationships and how online interactions can be good for you
  - B. Roommate relationships and how online interactions can be bad for you
  - C. Tile vs. carpet flooring
  - D. I don't remember

## REFERENCES

- Aron, A., Melinat, E., Aron, E. N., Vallone, R. D., & Bator, R. J. (1997). The experimental generation of interpersonal closeness: A procedure and some preliminary findings. *Personality and Social Psychology Bulletin*, 23(4), 363-377.
- Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2007). Computer-mediated communication and interpersonal attraction: An experimental test of two explanatory hypotheses. *CyberPsychology & Behavior*, 10(6), 831–836. doi:10.1089/cpb.2007.9945
- Antheunis, M. L., Schouten, A. P., Valkenburg, P. M., & Peter, J. (2012). Interactive uncertainty reduction strategies and verbal affection in computer-mediated communication. *Communication Research*, 39(6), 757–780. doi:10.1177/0093650211410420
- Baxter, L. A., & Philpott, J. (1982). Attribution-based strategies for initiating and terminating relationships. *Communication Quarterly*, 30, 217-224.
- Baym, N. K., Zhang, Y. B., & Lin, M. (2004). Social interactions across media: Interpersonal communication on the Internet, telephone, and face-to-face. *New Media and Society*, 6(3), 299-318.
- Berg, J. H. (1987). Responsiveness and self-disclosure. In Derlaga, V. J., & Berg, J.H. (Eds). *Self-disclosure: Theory, research, and therapy* (pp. 101-130). New York, New York: Plenum Press.
- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology*, 109(2), 186–204.
- Bessière, K., Kiesler, S., Kraut, R. & Boneva, B. (2008). Effects of Internet use and social resources on changes in depression. *Information Communication and Society*, 11 (1), 47-70.
- Broadhead, W.E., Gehlbach, S.H., de Gruy, F.V., & Kaplan, B.H. (1988). The Duke-UNC functional social support questionnaire: Measurement of social support in family medicine patients. *Medical Care*, 26(7), 709-723.
- Brown, G. W., & Bifulco, A. (1985). Social support, life events and depression. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 349-371). Dordrecht, The Netherlands: Martinus Nijhoff.
- Buhrmeister, M., Kwang, T., & Gosling, S.D. (2011). Amazon’s Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3-5.
- Byrne, D. E. (1971). *The attraction paradigm* (Vol. 11). Academic Pr.

- Byrne, D. E., & Nelson, D. (1965). Attraction as a linear function of proportion of positive reinforcements. *Journal of Personality and Social Psychology*, 1(6), 659.
- Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measure. *Computers in Human Behavior*, 18, 533–575.
- Caplan, S. E. (2003). Preference for online social interaction: a theory of problematic Internet use and psychosocial well-being. *Communication Research*, 30, 625–648.
- Caplan, S. E. (2005). A social skill account of problematic Internet use. *Journal of Communication*, 55, 721-736.
- Carpenter, J. M., Green, M. C., & LaFlam, J. (2011). People or profiles: individual differences in online social networking use. *Personality and Individual Differences*, 50, 538-541.
- Chan, D. K. S., & Cheng, G. H. L. (2004). A comparison of offline and online friendship qualities at different stages of relationship development. *Journal of Social and Personal Relationships*, 21(3), 305-320.
- Chen, Y., & Peng, S. S. (2008). University students' Internet use and its relationships with academic performance, interpersonal relationships, psychosocial adjustment and self-evaluation. *Cyberpsychology and Behavior*, 11(4), 467-469.
- Collins, N. L., & Miller, L. C. (1994). Self-disclosure and liking: A meta-analytic review. *Psychological Bulletin*, 116(3), 457–475. doi:10.1037/0033-2909.116.3.457
- Culnan, M. J., & Markus, M. L. (1987). Information technologies. In: F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: an interdisciplinary perspective* (pp. 420-443). Newbury Park, CA: Sage.
- Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organization design. *Research in Organizational Behavior*, 6, 191–233.
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32, 554–571.
- De Argaez, E. (2012). *Internet World Stats*. Retrieved from: <http://www.internetworldstats.com/stats.htm>.
- Dunkel-Schetter, C., & Skokan, L. A. (1990). Determinants of social support provision in personal relationships. *Journal of Social and Personal Relationships*, 7(4), 437-450.
- Granberg, D., & King, M. (1980). Cross-lagged panel analysis of the relation between attraction

- and perceived similarity. *Journal of Experimental Social Psychology*, 16(6), 573-581
- Green, M.C., & Brock, T. (2008). Antecedents and consequences of choosing real versus ersatz social activities. *Media Psychology*, 11(4), 566-592.
- Haber, M.G., Cohen, J.L., Lucas, T., Baltes, B.B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology*, 39, 133-144.
- Hays, R.D., & DiMatteo, M.R. (1987) A short-form measure of loneliness. *Journal of Personality Assessment*, 51(1), 69-81.
- Henrich, J., Heine, S.J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33, 62–135.
- House, J.S. (1981). *Work stress and social support*. Reading, Mass: Addison-Wesley.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241(4865), 540-545.
- Hoyle, R. H. (1993). Interpersonal attraction in the absence of explicit attitudinal information. *Social Cognition*, 11(3), 309-320.
- Huang, C. (2010). Internet use and psychological well-being: a meta-analysis. *Cyberpsychology, Behavior and Social Networking*, 13(3), 241-249.
- Iida, M., Seidman, G., Shrout, P. E., Fujita, K., & Bolger, N. (2008). Modeling support provision in intimate relationships. *Journal of Personality and Social Psychology*, 94(3), 460–478. doi:10.1037/0022-3514.94.3.460
- Jacobson, W.C., & Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavioral and Social Networking*, 14(5), 275-280.
- Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology*, 31(2), 177–192. doi:10.1002/ejsp.36
- Kalpidou, M., Costin, D., & Morris, J. (2011). The relationship between Facebook and the well-being of undergraduate college students. *CyberPsychology, Behavior, and Social Networking*, 14(4), 183-189.
- Katz, J.E., Rice, R. E., & Aspden, P. (2001). The Internet 1995-2000: Access, civic involvement and social interaction. *American Behavioral Scientist*, 45(3), 405-419.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, 58( 1), 49-74.

- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological wellbeing? *American Psychologist*, *53*, 1011-1031.
- Ledbetter, A. M., Mazer, J. P., DeGroot, J. M., Meyer, K. R., Mao, Y., & Swafford, B. (2011). Attitudes toward online social connection and self-disclosure as predictors of Facebook communication and relational closeness. *Communication Research*, *38*(1), 27–53. doi:10.1177/0093650210365537
- Matsuba, M.K. (2006). Searching for self and relationships online. *Cyberpsychology and Behavior*, *9*(3), 275-284.
- McKenna, K. Y. A., & Bargh, J. A. (1999). Causes and consequences of social interaction on the Internet: A conceptual framework. *Media Psychology*, *1*, 249–269.
- McKenna, K. Y. A., & Bargh, J. A. (2000). Plan 9 from cyberspace: The implications of the Internet for personality and social psychology. *Personality and Social Psychology Review*, *4*, 57 -75.
- McKenna, K. Y. A., Green, A. S., & Gleason, M. E. J. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues*, *58*(1), 9–31. doi:10.1111/1540-4560.00246
- Miller, L. C., Berg, J. H., & Archer, R. L. (1983). Openers: Individuals who elicit intimate self-disclosure. *Journal of Personality and Social Psychology*, *44*(6), 1234.
- Morgan, C., & Cotten, S. R. (2003). The relationship between Internet activities and depressive symptoms in a sample of college freshmen. *Cyberpsychology and Behavior*, *6*, 133–142.
- Morse, B.J., Gullekson, N.L., Morris, S.A., & Popovich, P.M. (2011). The development of a general Internet attitudes scale. *Computers in Human Behavior*, *27*, 480-489
- Nguyen, M., Bin, Y. S., & Campbell, A. (2012). Comparing online and offline self-disclosure: a systematic review. *Cyberpsychology, Behavior and Social Networking*, *15*(2), 103-111.
- Nie, N. H., & Erbring, L. (2000). Internet and society: A preliminary report. Stanford Institute for the Quantitative Study of Society. Retrieved June 6, 2008, from [http://www.stanford.edu/group/siqss/Press\\_Release/Preliminary\\_Report.pdf](http://www.stanford.edu/group/siqss/Press_Release/Preliminary_Report.pdf).
- Nie, N. H. (2001). Sociability, interpersonal relations, and the Internet: Reconciling conflicting findings. *American Behavioral Scientist*, *45*(3), 420–35.
- Paolacci, G., Chandler, J., & Ipeirotis, P.G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, *5*(5), 411-419.

- Parks, M. R., & Floyd, K. (1996). Making friends in cyberspace. *Journal of Communication*, 46(1), 80–97. doi:10.1111/j.1460-2466.1996.tb01462.x.
- Peter, J., Valkenburg, P. M., & Schouten, A. P. (2006). Characteristics and motives of adolescents talking with strangers on the Internet. *CyberPsychology & Behavior*, 9(5), 526–530. doi:10.1089/cpb.2006.9.52680-97.
- Peter, J., & Valkenburg, P. M. (2006). Research note: Individual differences in perceptions of Internet communication. *European Journal of Communication*, 21(2), 213-226.
- Peters, L., Sunderland, M., Andrews, G., Rapee, R.M., Mattick, R.P. (2011). Development of a short form Social Interaction Anxiety (SIAS) and Social Phobia Scale (SPS) using nonparametric Item Response Theory: The SIAS-6 and the SPS-6. *Psychological Assessment*, 24(1), 66-76.
- Rammstedt, B., & John, O.P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41, 203-212.
- Rice, R. E. (1993). Media appropriateness: Using social presence theory to compare traditional and new organizational media. *Human Communication Research*, 19, 451–484.
- Sandler, I., Wolchik, S., & Braver, S. (1985). Social support and children of divorce. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 371-389). Dordrecht, The Netherlands: Martinus Nijhoff.
- Schiffirin, H., Edelman, A., Falkenstern, M., & Stewart, C. (2010). The associations among computer-mediated communication, relationships, and well-being. *Cyberpsychology, Behavior and Social Networking*, 13(3), 299-306.
- Selfhout, M., Denissen, J., Branje, S., & Meeus, W. (2009). In the eye of the beholder: Perceived, actual, and peer-rated similarity in personality, communication, and friendship intensity during the acquaintanceship process. *Journal of Personality and Social Psychology*, 96(6), 1152.
- Shaw, L. H., & Gant, L. M. (2002). In defense of the Internet: The relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *Cyberpsychology and Behavior*, 5(2), 157–171.
- Siedlecki, K. L., Salthouse, T. A., Oishi, S., & Jeswani, S. (2013). The relationship between social support and subjective well-being across age. *Social Indicators Research*. doi:10.1007/s11205-013-0361-4.
- Suler, J. (2004). The online disinhibition effect. *CyberPsychology & Behavior*, 7(3), 321–326. doi:10.1089/1094931041291295.

- Symantec Corporation. (2009). *The Norton Online Living Report*. Retrieved from [http://www.protegiendoles.org/documentacion/estante4/NOLR\\_Report\\_09.pdf](http://www.protegiendoles.org/documentacion/estante4/NOLR_Report_09.pdf).
- Tidwell, L. C., & Walther, J. B. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research*, 28(3), 317–348. doi:10.1111/j.1468-2958.2002.tb00811.x.
- Trevino, L. K., Lengel, R. H., & Daft, R. L. (1987). Media symbolism, media richness and media choice in organizations: A symbolic interactionist perspective. *Communication Research*, 14, 553–575.
- Turner, R. J. (1981). Social support as a contingency in psychological well-being. *Journal of Health and Social Behavior*, 357-367.
- Valkenburg, P. M., & Peter, J. (2007). Online communication and adolescent wellbeing: Testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, 12(4), 1169–1182.
- Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, 23(1), 3–43. doi:10.1177/009365096023001001.
- Wang, H., & Wellman, B. (2010). Social connectivity in America: changes in adult friendship network size from 2002 to 2007. *American Behavioral Scientist*, 53(8), 1148-1169.
- Wastlund, E., Norlander, T., & Archer, T. (2001). Internet blues revisited: Replication and extension of an Internet Paradox study. *Cyberpsychology and Behavior*, 4(3), 385-391.
- Wellman, B., & Wortley, S. (1990). Different strokes from different folks: Community ties and social support. *American Journal of Sociology*, 96(3), 558–588.
- Wentzel, K. R., & Erdley, C. A. (1993). Strategies for making friends: Relations to social behavior and peer acceptance in early adolescence. *Developmental Psychology*, 29, 819-826.
- Wilcox, B. L., & Vernberg, E. M. (1985). Conceptual and theoretical dilemmas facing social support research. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 3-20). Dordrecht, The Netherlands: Martinus Nijhoff.