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# SOCIAL INFLUENCE IN ONLINE HEALTH DISCUSSIONS: AN EVALUATION OF ONLINE GRADUATE STUDENT SUPPORT GROUPS

By

Erin Kay Maloney

# A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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#### ABSTRACT

# SOCIAL INFLUENCE IN ONLINE HEALTH DISCUSSIONS: AN EVALUATION OF ONLINE GRADUATE STUDENT SUPPORT GROUPS

By

# Erin Kay Maloney

This paper reports on the results of a field experimental design assessing online support groups testing hypotheses derived from the social identification model of deindividuation effects (SIDE; Lea & Spears, 1992) and social information processing theory (SIP; Walther, 1992). Specifically, it is predicted that individuals in an online support group will not distinguish group members from each other initially, but over time, they will begin to differentiate group members from each other. Research questions are posed about the drivers of peoples' perceptions of their group members' credibility and similarity to themselves, and which perceptions are significant predictors of willingness to accept advice provided by a fellow support group member. Kenny's (1994) social relations analysis (SRA) is used to determine how much group variance on ratings of competence, trustworthiness, goodwill, and homophily is attributable to the person making the judgment (judge), the person being judged (target), the unique relationship between a particular judge and a particular target, and error. For visually anonymous groups, the results of these analyses indicate significant judge variance for trustworthiness at time 1 and competence and goodwill at time 2. For visually identifiable groups, results indicate significant judge variance for trustworthiness at times 1 and 2 and competence across all time periods. Linear mixed modeling procedures are used to determine if perceptions of credibility are significant predictors of one's likelihood to

take advice given by a fellow support group member. Results indicate that perceived competence is a significant positive predictor advice provided by a fellow group member in visually anonymous groups, and perceived homophily is a significant positive predictor of confidence in graduate school advice provided by a fellow group member in visually identifiable groups. Perceived goodwill is a significant negative predictor of confidence in graduate school advice provided by a fellow group member in both visibility conditions. These findings provide insight into social influence in online healthrelated support groups. For my family, the best support system in the world.

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## **Literature Review**

# Social Support

Social support is widely recognized as a meaningful predictor of physical and psychological well-being (for reviews, see Burleson, Albrecht, Goldsmith, & Sarason, 1994; Pennebaker & Traue, 1993). In addition to the backing and encouragement offered by family members and close others, for decades, people have found compassion, information, and reassurance of normality in support groups that meet at a specified location on a regular basis. A substantial literature offers evidence for positive outcomes from these groups, including understanding and illness management (e.g., Coulson, 2005), successfully overcoming a health condition (e.g., Gorin et al., 2005), and even higher survival rates among those diagnosed with life-threatening diseases (e.g., Lehman, Ellard, & Wortman, 1986).

In relatively recent years, traditional face-to-face health support groups have developed online duplicates (Braithwaite, Waldron, & Finn, 1999) and thousands of new self-help and support groups have originated online. This provides a unique opportunity for those suffering from health conditions to discuss their illnesses with others like themselves from the convenience, privacy, and comfort of their own homes. A recent meta-analysis of computer-mediated support groups (CMSG's) identified a number of positive outcomes associated with participation in these online groups including decreased depression, increased quality of life, and increased self-efficacy to manage one's health condition (Rains & Young, 2009).

In addition to the emotional and esteem support provided in online support groups, several participants have noted information seeking as a common goal of support group

members (Klemm, Reppert, & Visich, 1998). Preece (1999) identified 'Question/Answer' (i.e. factual) information exchanges as the third most common type of posting in an online support group (17.4% percent of postings), behind empathic messages (44.8%), and personal narratives (32%). The same study (Preece, 1999) indicated that some people seek out online support groups for information as an alternative to information from professionals, such as doctors and therapists. This introduces a series of new questions about potential implications regarding who people choose to trust for health information and why.

The present study uses a field experiment to test several predictions about social influence in online health-related support groups. Social influence has been defined as a change in a person's "...behaviors, opinions, attitudes, goals, needs, values, or any other aspect of one's psychological field" as a result of another "...person, role, norm, group, or part of a group" (French & Raven, 2001, pp. 61-62). Extant literature has listed a number of source characteristics that have been shown to increase communication effectiveness and social influence. Two of these predictors are: perceived similarity to the message recipient (homophily; McCroskey, Richmond, & Daly, 1975) and perceived credibility (McCroskey & Teven, 1999). Thus, this study seeks to take a first step in understanding social influence among members of online support groups by assessing online support group participants' perceptions of their fellow group members' homophily and credibility. Social relations analysis is used to identify which, if any, of the dimensions of credibility or homophily are the most important predictors of individuals' willingness to take advice from other group members.

Based on an extensive literature review of health-related CMSG's, Wright and Bell (2003) described computer-mediated support as a "nexus" of the relatively established research in social support and the comparatively infantile research in computer-mediated communication (CMC) (p. 50). The researchers called for empirical studies to draw upon both areas to gain a clearer perspective of online support. One area that has yet to be explored extensively is social influence in these support groups. The purpose of this study is to take a first step towards understanding influence in CMSG's by testing predictions drawn from theory in a real-world computer-mediated support setting. First, an overview of an influential theory of intergroup dynamics in CMC, the social identification model of deindividuation effects (SIDE, Spears & Lea, 1992), will be presented. Predictions about interpersonal influence processes in CMSG's drawn from the theory will be discussed, however, past tests of this theory don't allow for generalizability of SIDE theory. A longitudinal study is proposed to investigate the nature of social influence in an online graduate student support group. A series of research questions are then posed to gain insight into social influence within the groups. Implications of these findings will be discussed in terms of how they advance theory and the insight they provide into best practices for future CMSG's.

#### **Online Social Support**

Four motivational draws to online over face-to-face support groups were identified by Walther and Boyd (2002) through an extensive survey of online support users. First, the online support groups attract people from all over the world, as opposed to face-to-face groups that are composed of people who must be located within a reasonable proximity to each other in order to travel to the group on a regular basis. The

greater variety of people attending the online group from all over the world may increase chances for "greater expertise, stigma management, and more candor" (p. Walther & Boyd, 2002, 179).

Preece (1999) suggested that sometimes "greater expertise" stems from personal accounts of one's struggle with an illness, rather than a detailed understanding of the science behind it (p.63). The authors state, "Physicians can provide the facts, but other patients can tell you what it really feels like and what to expect next, in a way that only someone with personal experience can" (p. 63). Therefore, online support may be particularly beneficial for cases in which a person is suffering from an illness or health condition that is uncommon and would not likely be an experience that is shared by very many others within a reasonable proximity.

Additionally, because group members are from all over the world rather than from one's immediate area, one's group may not be composed of people who are involved with other aspects of his or her life. This may decrease concerns about being judged by fellow group members. Wood and Smith (2001) proposed this as a possible explanation for their finding that participants in online exchanges disclosed more about their conditions than their face-to-face counterparts.

The second aspect of computer-mediated communication that attracts people to computer-mediated support offers high levels of anonymity, compared to face-to-face interactions. Wright (2000) found that higher levels of anonymity helped online participants in various types of online support groups, including substance abuse problems, eating disorders, cancer, and mental illness, feel more comfortable talking openly about their struggles and less stigmatized.

Third, online support provides more potential time for interaction management, so that individuals are able to think about, revise, and edit statements before sharing them with others. Finally, computer-mediated support groups offer access to support at any time. The asynchronous nature of online support groups has been noted as both a benefit and a drawback. It may be beneficial because it allows group members to seek support at any time and doesn't require that they set aside specific times of their week to travel and meet with the group. However, Wright (2000) found that people frequently reported the inability to find a certain person online at a specific time as a disadvantage of online support.

In addition to the inability to find particular people for online support from time to time, the anonymity provided by computer-mediated communication may raise speculation about the credibility of support providers online. Recent studies of advicegiving in anonymous online settings confirmed that, just as past findings about face-toface interactions, perceptions of source credibility serve as a mediating variable between a message delivered by a source and attitudes formed based on this message (Wang, Walther, Pingree, & Hawkins, 2008). Therefore, it is important to uncover how people make judgments about the credibility of information sources in online support groups.

These issues regarding the cues people use to make judgments about source credibility and subsequent social influence within computer-mediated support groups are only unique because of the channel through which information is being exchanged. Therefore, it seems appropriate that these questions should be addressed by applying theories of computer-mediated communication to this particular environment. The following section discusses a theory of computer-mediated communication that

specifically addresses the issue of social influence, Spears and Lea's (1992) SIDE. Predictions are drawn from the theory about the effects of online support exchange. SIDE

The social identification model of deindividuation effects (SIDE; Spears & Lea, 1992) draws from self-categorization theory (Turner, 1982), and social identification theory (Tajfel, 1981) to make predictions about how individuals will relate to one another in online group settings. According to self-categorization theory, people in social situations mentally place themselves and others into groups that are most advantageous to them at the time (e.g. race, age, educational experience).

Because people in online discussions are unable to see the physical attributes of their fellow group members, they are less able to place them into separate groups instantly upon meeting them. Thus, people tend to categorize all members of the group simply as 'a member of this online group.' According to Turner, Hogg, Oates, Reicher, & Wetherel (1987), individuals categorize themselves and others as a group if they perceive the differences among them are less than the differences between themselves and others. The authors specify that the others do not have to be physically present at the time.

Social identity theory asserts that when people classify others into these categories, they tend to think of groups in which they classify themselves as the 'ingroup,' and groups to which they do not belong as 'outgroups.' As described by Turner (1982), "The first question determining group belongingness is not 'Do I like these individuals?', but 'Who am I?' What matters is how we perceive and define ourselves and not how we feel about others" (p. 16). Because people equate members of the ingroup with themselves, in order to boost their own self-esteem, they naturally begin

to think positively of characteristics of the ingroup and think negatively about characteristics of the outgroup.

SIDE posits that when group identification is salient and online group members are visually anonymous to each other, they become depersonalized to one another. Depersonalization is a state in which all group members are viewed interchangeably and defined fully by their membership in the group (as a result of self-categorization; Turner, 1982). Depersonalization is said to generate cohesiveness within the group, not due to attraction to individuals within the group, but rather due to attraction to the group as a whole (as a result of social identification; Tajfel, 1981). Due to this sense of cohesiveness, online groups are said to be more susceptible to normative influence within the group (e.g, Lee, 2006; Postmes, Spears, & Lea, 2002; Postmes, Spears, Sachkel, & DeGroot, 2001).

# **Applying SIDE to Online Health Discussions**

Based the previously discussed conditions (i.e., visual anonymity, a salient social identity) under which the SIDE predictions of depersonalization, group attraction, and an increased adherence to group norms are most likely to occur, it seems likely that online health discussions, and support groups in particular, should provide an optimal real world setting for SIDE effects to take place. The requirement of visual and biographical anonymity is typically fulfilled in most online support groups because members make up usernames that show up as indicators that they posted the message; the forums are usually devoid of pictures and the vast majority of users choose not to complete optional profiles in which they can share additional information about themselves (e.g., where they live, additional interests, etc.).

The requirement of a salient sense of social identity may be expected to be stronger in health-related support groups than the zero-history, minimal groups used in traditional SIDE studies. This is because the primary topic of discussion in health-related support groups online is generally the same as the issue that makes all group members similar to one another: the health problem from which they are suffering. Conversely, in most SIDE studies, task-based or social groups are primed to identify with group members due to similarities that are unrelated to the point of the discussion. For example, identification based on country of origin most likely is not related to the task of determining which of two proposed hospital policies should be implemented in a task completion assignment (i.e., Postmes, Spears, Sakhel, & de Groot, 2001).

Because online support group members generally are visually anonymous, and group identity is likely to be salient for members, SIDE would suggest that group members should be depersonalized to one another. By definition, depersonalized group members should be expected to evaluate all group members equally (Postmes & Spears, 1998). This implies that individuals within a group should draw no distinction among other group members in terms of their personal characteristics, such as how credible they are. Furthermore, because people are likely to place themselves into the same social category as their fellow group members, and social identification theory postulates that people boost their own self-esteem by thinking highly of their ingroup members, the blanket evaluation that online support users make about their fellow group members is likely to be positive.

Perceptions of source credibility serve as one of the mediators between a message provided by that source and attitudes formed based on that message (e.g., Wang et al.,

2008). Therefore, SIDE would suggest that group members should evaluate all other group members as equally credible, and they should be equally confident in health advice from any given member of the group. This could be problematic if advice provided is not in the best interest of the recipient. For example, it is a well-known marketing technique (i.e., 'guerrilla marketing,' 'undercover marketing') to hire people to pose as average citizens discussing their positive experiences with a particular product in a public place such as a bar (Kennett & Matthews, 2008). It is plausible that pharmaceutical companies may hire people to log into support groups and to discuss the merits of a particular medication or poor side-effects associated with a competing brand. The limited surveillance and ease of posting misinformation in online health forums raises a number of concerns among health practitioners about the advice that may be acquired by health information seekers (Weis et al., 2003).

If SIDE theory is correct, online support users may be more likely to adhere to health advice provided by other unknown people online than people with whom they interact with in person. However, there are several limitations with the SIDE theory that must be addressed before applying it to make predictions about an online support setting over time. The following section notes methodological limitations to the experimental studies that have produced data consistent with SIDE predictions in the past. The operationalization of depersonalization, and limitations on time provided for interpersonal interaction, are discussed as two aspects of past SIDE studies that may limit the generalizability of these findings over time.

# **Problems with Induction Checks on Depersonalization**

Depersonalization is conceptualized as the inability of people within a group

to draw distinctions among members of their ingroup (i.e., all group members are thought to be exactly the same along all dimensions; for example, they are all seen as equally credible) (e.g., Postmes, Spears, & Lea, 2002). SIDE researchers reason that if members of online groups are visually anonymous, group members remain depersonalized to one another. In order to determine the extent to which depersonalization in groups exists, some studies have used measures of perceived anonymity (e.g. Lea & Spears, 1992) or self-awareness (Postmes, Spears, Sahkel, & DeGroot, 2001) as a check on depersonalization such that high perceived anonymity and low self-awareness are indicative that depersonalization exists. This standard conceptual definition of depersonalization (Postmes, et al. 2002), does not match the operationalization of depersonalization in past experimental tests of SIDE (e.g., Lea & Spears, 1992; Postmes, Spears, Sahkel, & deGroot, 2001). Neither visual anonymity nor reduced private selfawareness is completely consistent with the conceptual definition that individuals are unable to draw distinctions on any dimension among group members. A measure of reduced private self-awareness is more consistent with the construct of *deindividuation*, the phenomenon that was originally thought be the driver of an increased adherence to norms in online groups according to SIDE theory.

Deindividuation is conceptualized as a lowered sense of private self-awareness to the point that it is difficult to distinguish oneself from other members of the group.

Several studies that are guided by the modified version of the SIDE theory that proposes depersonalization (as opposed to deindividuation) as a key mediator have attempted to measure depersonalization through self-report measures of interpersonal versus group identification (e.g., Postmes, Spears, & Lea, 2002; Rogers & Lea, 2004). A

closer examination of the items used to measure each construct indicates that the items have limited face validity. For example, items used by Spears & Lea (1992) to measure group identification included, 'Group members are similar to one another,' and 'The group's opinions are important.' One may believe that his or her group members are similar to one another in some aspects, but still not identify with the group as a whole. Likewise, regarding the second item, valuing the opinion of a group does not necessitate that an individual believes each person in the group holds exactly the same opinions. Other SIDE studies that are guided by the modified version of the theory simply did not perform induction checks for visual anonymity promoting depersonalization (e.g., Lee, 2006; Sassenberg & Postmes, 2002). Given the centrality of depersonalization to SIDE theory, invalid or non-existent measures of the variable leave tests of SIDE open to alternative explanations for the findings. Maloney (2010) tested one alternative explanation.

Maloney (2010) suggested that participants used in past tests of SIDE were unlikely to be highly involved with experiments testing the theory. Specifically, the Maloney study was based on the observation that SIDE experiments used zero-history groups composed of undergraduate students, and were asked to form attitudes about low involvement topics, such as a hypothetical hospital policy (e.g., Postmes, Spears, Sakhel, & de Groot, 2001). Based on Chaiken's (1980) heuristic-systematic model (HSM), Maloney (2010) proposed that visual anonymity in past SIDE studies (which is generally considered an induction for depersonalization) was confounded with a lack of heuristic cues on which low-involved participants are likely to form attitudes towards an issue.

When participants are visually anonymous to one another, and are primed with a group norm before entering into a group discussion, the most obvious heuristic for them to use is likely to be 'consensus implies correctness.' Other obvious heuristics, such as physical attractiveness derived from visual representation, were purposely eliminated from the visually anonymous groups in these studies beforehand.

Participants in groups who were visible to one another were primed with a group norm before the discussion as well, but they also had access to heuristic cues related to visibility, such as physical attractiveness. Because there were multiple obvious heuristics at the disposal of participants in visually identifiable groups, and there was only one obvious heuristic available to participants in visually anonymous groups, there should have been greater variability in attitudes formed by the latter than those formed by the former. Thus, according to this rationale, there should be lower variability in attitudes formed by participants in visually anonymous groups than those formed by participants in visually identifiable conditions not due to group identification and depersonalization, but due to the number of obvious heuristics available to participants.

To test the SIDE theory prediction against the HSM rationale for the results obtained in past studies, Maloney (2010) used an experimental design testing SIDE theory with an added induction to create high and low involvement conditions. Unlike low involvement conditions, in which SIDE and HSM make the same prediction that attitudes formed by individuals in visually anonymous groups would be more polarized than attitudes formed by individuals in identifiable groups, the two theories make different predictions. SIDE would still predict that visual anonymity would produce greater cohesiveness. HSM, however, would predict that regardless of visual anonymity

or identifiability, highly involved participants will form attitudes based on argument quality. Results did not clearly support hypotheses derived from either theory. One issue raised in the discussion of findings is that participants in the high involvement condition appeared to form attitudes that were consistent with participants processing heuristically. It is possible that although participants in the high-involvement condition were significantly higher involved than the midpoint of the scale, they still did not reach the threshold required to motivate them to scrutinize messages. The study recommended that perhaps online health discussions would be more accurately studied in real-world settings where involvement and social identification would not have to be induced.

The present study, which follows from the work of Maloney (2010), allows for natural variation in social identification and outcome-relevant involvement by using realworld online support groups, and introduces a new method to test for depersonalization within these groups. A field experimental design was used to examine interpersonal impression formation and influence in computer-mediated graduate student support groups conducted over a six week time period. Six different CMSG's were randomly assigned to be either visually anonymous or visually identifiable. The applicability of SIDE predictions to computer-mediated health support groups are assessed by measuring individuals' perceptions of each group member on a number of dimensions, including perceived competence, trustworthiness, goodwill, and similarity to themselves at three different time periods over the course of six weeks.

Depersonalization, a key mediator in SIDE theory, is assessed by comparing the variance in individuals' ratings of each group member on different dimensions. As noted previously, past attempts to perform induction checks on depersonalization have been

inconsistent with the conceptual definition of the term. In order to perform an induction check for depersonalization in the present study, it is suggested that the SIDE concept of depersonalization can be represented statistically by minimal variance across individuals' ratings of their group members on all dimensions. One way to assess differences between the variance in ratings across group members is by performing a statistical procedure called social relations analysis (SRA) based on Kenny's (1994) social relations model (SRM). The following section discusses the concept of SRM at a conceptual level and poses a hypothesis regarding the expected SRA results based on SIDE theory.

#### Social relations analysis

SRM is a methodological tool that has been used by researchers to analyze data dealing with a variety of interpersonal perceptions including (but not limited to): attraction and friendship (Back, Schmuckle, & Egloff, 2008), aggression and prosocial behavior (Card, Little, & Selig, 2008), and leadership (Livi, Kenny, Albright, & Pierro, 2008). The model breaks interpersonal judgments into three components: judge effects, target effects, and relationship effects, all of which are considered in social relations analysis (SRA).

Judge effects (a.k.a. actor effects or perceiver effects) are defined as, "...the extent to which a perceiver sees targets as high or low on the trait" (Kenny, 1994, p. 18). For example, an individual making judgments may produce an entire range of judgments about the trustworthiness of a variety of partners, but overall, the judge may demonstrate a tendency to rate each partner as slightly more trustworthy than all other judges rate that partner; this can be captured through SRA.

Target effects (a.k.a. partner effects) represent "...the extent to which a target is seen by perceivers as high or low on the trait" (Kenny, 1994, p. 18). For example, some judges may tend to overestimate trustworthiness, and other judges may tend to underestimate trustworthiness, but overall the target will be judged similarly in the rank ordering of trustworthiness relative to the other targets.

Finally, relationship effects refer to the unique relationship between any given judge and partner combination. Relationship effects are conceptualized as, "...the degree to which a given perceiver sees a given target as high or low on the trait, with perceiver and target effects controlled" (Kenny, 1994, p. 18). This effect is calculated by determining the way a judge rates a partner statistically controlling for the judge effect and the partner effect. Relationship effects calculated this way, however, are naturally confounded with error. There are methods that can be used to untangle the two sources of variances (see Appendix A), but the current study does not focus on relationship effects, and so the steps are not taken to separate the two sources of variance. Therefore, readers should note that the relationship variance reported in this paper is confounded with error variance and should be interpreted cautiously, if at all.

SRA considers all three of the previously described effects simultaneously to analyze interpersonal impressions within groups. To further illustrate the concept, Kenny, Kashy, and Cook (2006, p. 191) described a hypothetical relationship between the dyad, Allison and Beth. If Allison and Beth were part of the same group, Allison's rating of Beth's extroversion would be a function of:

Allison's	Group	Allison's	Beth's	Allison's	
rating of	Mean for	tendency	tendency to	unique	

Beth's	=	extroversion	+	to see	+	be seen as	÷	perception
extroversion		(group		others as		extroverted		of Beth's
		effects)		extroverted		(partner/target		extroversion
				(actor/judge		effect)		(relationship
				effect)				effect)

For a round robin design (i.e., a data collection design in which all actors and partners provide ratings of each other), the equation used to represent this model of variance is (Kenny et al., 2006, p. 193):

 $X_{ij} = m + a_i + b_j + g_{ij}$ 

In the above equation,  $X_{ij}$  is the score for person *i* rating (or behaving with) person *j*; *m* is the group mean;  $a_i$  represents the person *i*'s actor effect;  $b_j$  indicates the person *j*'s partner effect; and  $g_{ij}$  is the relationship effect between persons *i* and *j*. In the previous equation, *a*, *b*, and *g* are treated as random variables.

The focus of SRA is not on actor, partner, and relationship effects themselves, but rather on the variances of these three random variables. Once actor, partner, and relationship effects are determined, the variance in these effects across actors and partners are calculated. The magnitudes of these variances provide insight into interpersonal perceptions within groups.

In SRA, a large target variance and small judge variance is indicative of *consensus*. Consensus is a term used to describe consistency of different judges' ratings of an individual target in a group. According to Markey and Wells (2002), "If each target

received exactly the same rating from all of the judges and targets differed from each other on these ratings, then there would be perfect consensus" (p. 138). Conversely, large judge variance and small target variance indicates inconsistency across judges in their ratings of target group member characteristics. In SRM, this is referred to as *assimilation*. According to Markey & Wells (2002), "Assimilation is at its highest when a single judge rates each target exactly the same, but judges differ from each other in their ratings" (p. 137).

It should be noted that term "assimilation," as it is used regarding social relations analysis, refers to a specific statistical outcome based on an examination of the variance associated with each object of evaluation's rating on semantic differential scales. This is different from the traditional conceptualization of assimilation as it is used in the literature on intercultural communication, in which the term refers to "…the process of resocialization that seeks to replace one's original worldview with that of the host culture" (Bennett, 1998, p. 14). Therefore, in order to reduce confusion, this paper will refer to social relations analysis assimilation as "SRA assimilation."

Analysis of actor, partner, and relationship variance in online support groups can provide insight into different phenomena associated with interpersonal perceptions. For example, conceptually, group members who are depersonalized to one another should be unable to differentiate among their fellow group members, and therefore, they should evaluate all group members in exactly the same way. This is the same concept as the previously described SRA assimilation. Using a social relations analysis design will allow a researcher to test for depersonalized perceptions in online support groups (which is conceptually and operationally equivalent to SRA assimilation).

Based on the SIDE assumption that visual anonymity in online groups promotes depersonalization, online groups who are visually anonymous to each other should demonstrate a greater degree of SRA assimilation than online groups who are not visually anonymous to one another. Recalling the aim of this study to investigate perceptions of credibility and similarity in online support groups, the first set of hypotheses deal with participants' perceptions of their individual group members' credibility, as it is conceptualized by McCroskey and Teven, 1999: a.) competence (i.e., "qualification, expertness, intelligence, authoritativeness"), b.) trustworthiness (i.e., "character, sagacity, safety, honesty"), and c.) goodwill (i.e., "intent toward receiver") (p. 90), and homophily ("source-receiver similarity") (McCroskey, Richmond, & Daly, 1975, p. 323). Because SIDE studies generally take post test measures within minutes after interacting with their group members, the first prediction can be made only about time one of the three data collection time points over the course of six weeks.

H1: At time one, participants in visually anonymous conditions will demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived (a) competence (b) trustworthiness (c) goodwill and (d) homophily of group members, than participants in visually identifiable conditions.

# Time

H1 makes a prediction about initial perceptions of group members (at time one) because a substantial sector of the CMC literature has provided evidence that this effect may not hold over time. Walther, Anderson, and Park (1994) performed a meta-analysis

to examine the effects of time restriction on social interaction in CMC. Time was identified as a moderator based on Walther's (1992) social information processing perspective (SIP), such that time-limited studies (including almost all experimental studies testing SIDE) were thought to interrupt CMC participants before a sufficient number of messages had been exchanged for interpersonal effects to accrue, making CMC appear inherently less social than non-mediated communication.

SIP suggests that over time, people engaging in online discussions eventually do differentiate group members from one another to the same degree as they do in face-to-face groups. In contrast, time is not addressed as variable in SIDE; the theory does not make any predictions about levels of depersonalization changing over time. Thus, one must assume a SIDE hypothesis would still predict fully depersonalized group members after the passage of time in visually anonymous conditions. That is, despite repeated interactions over time, the inability for individuals in visually anonymous groups to distinguish among their fellow group members will persist. Therefore, data that are consistent with the following set of hypotheses which are derived from SIP will be contradictory to predictions that can be drawn from SIDE.

Recall that SRA assimilation (indicated when each judge rates all targets in the same way, but judges differ in the way they rate targets) is conceptually the same as depersonalization. SIDE would predict that depersonalization (measured as SRA assimilation) will persist over time. SIP would predict that group members would differentiate group members in terms of perceived competence, trustworthiness, goodwill, and homphily over time, and therefore any degree of depersonalization (measured as SRA assimilation) initially experienced by group members should decrease over time. Thus, in accordance with SIP, Hypothesis 2 predicts:

H2: SRA assimilation for (a) competence (b) trustworthiness (c) goodwill and (d) homophily will decrease from time 1 to time 2 in both visually anonymous and visually identifiable conditions.

H3: SRA assimilation for (a) competence (b) trustworthiness (c) goodwill and (d) homophily will decrease from time 2 to time 3 in both visually anonymous and visually identifiable conditions.

Hypotheses 2 and 3 predict that both visually anonymous and visually identifiable CMSG members are likely to differentiate among group their members in terms of perceived competence, trustworthiness, goodwill, and homophily over time. What is unknown, then, is which attributes (e.g., perceived competence, perceived trustworthiness) give people more or less influence online in terms of the advice they provide to fellow group members? The following section proposes several different factors that may play a role in determining the confidence that others might have in the advice provided by individuals within a support group. A research question is then posed to determine which, if any of these factors contribute significantly to CMSG members' confidence provided by any particular individual within the group.

Uncovering what attributes raise others' confidence in advice offered by individuals within a CMSG and understanding if perceptions that others possess these

attributes can be attributed mostly to individual judge's personal biases (indicated by SRA assimilation), or traits demonstrated by targets that are recognized by all (indicated by consensus) will provide valuable insight into social influence processes in CMSG's.

One attribute that may contribute to group members' confidence in advice provided by an individual in a CMSG is the degree to which the individual is perceived to be a competent in the area in which the advice is offered. In a moderated CMSG, individuals may be perceived to be competent in the area for a number of reasons. For example, the group moderator may be considered competent because he or she is often the only member of the group that is a professionally trained to counsel others. On the other hand, individuals may perceive their fellow group members to be more competent in the area because unlike the group moderator, other group members are actually experiencing the stressor that is common to all others in the group. Sharing accounts of one's firsthand experience with potential solutions or treatments may bolster a fellow group member to be perceived as more competent than the group moderator, who is trained not to share any personal information with the group. Therefore, research questions are put forth to determine the magnitude of variance in perceptions of competence within the group is explained by individual characteristics of judges and individual characteristics of targets.

RQ1: Does judge variance contribute significantly to explain total variance in perceived competence among CMSG members?

RQ2: Does target variance contribute significantly to explain total variance in perceived competence among CMSG members?

Competence was discussed previously as a part of the multi-dimensional construct of source credibility. Perceptions of source credibility have been shown to mediate the relationship between a message delivered by a source and people's attitudes formed based on this message (Wang, Walther, Pingree, & Hawkins, 2008). Therefore, it seems that the other two dimensions of credibility (as conceptualized by McCroskey and Teven, 1999)—trustworthiness and goodwill—should play a role in determining people's levels of confidence in the advice given by an individual in a CMSG. Consequently, it is important to uncover the magnitude of variance in perceptions of trustworthiness and goodwill within the group is explained by judge and partner variances, respectively.

RQ3: Does judge variance contribute significantly to explain total variance in perceived trustworthiness among CMSG members?

RQ4: Does target variance contribute significantly to explain total variance in perceived trustworthiness among CMSG members?

RQ5: Does judge variance contribute significantly to explain total variance in perceived goodwill among CMSG members?

RQ6: Does target variance contribute significantly to explain total variance in perceived goodwill among CMSG members?

Finally, recalling the previously discussed study by Preece (1999) that suggested a firsthand expert (i.e., somebody with real experience who can offer their firsthand account of a illness) may be a more trusted source than a professional expert, it may be the case that perceived similarity to the source of advice may increase one's confidence in the advice provided. Therefore, it is important to know what drives perceptions of similarity to an individual within a group.

RQ7: Does judge variance contribute significantly to explain total variance in perceived homophily among CMSG members?

RQ8: Does target variance contribute significantly to explain total variance in perceived homophily among CMSG members?

A goal of the present study is to understand the process of social influence in CMSG's. The above research questions address a number of potential factors that may contribute to support group members' confidence in advice provided by individuals in the group. The final research question seeks to identify if any attributes can be possessed by individuals to increase others' confidence in the advice they provide. RQ9: Do the factors proposed above (perceived competence, trustworthiness, goodwill, and homophily) contribute significantly to participants' confidence in advice provided by specific members of their group?

# Method

## **Overview**

The present study was conducted through collaboration between researchers in the Department of Communication and the Counseling Center at Michigan State University. The Counseling Center has been offering face-to-face doctoral support groups led by a professionally trained moderator twice per year for three years. These groups meet weekly for a time period of six weeks. For this study, six support groups were offered online throughout the spring semester of 2010. The groups were run in exactly the same manner as the face-to-face groups, except that participants met in an online chat session, rather than face-to-face in the Counseling Center.

All groups used the same goal-focused approach to stress relief and degree progress. During the first meeting, participants set an overall, large goal to accomplish by the end of the six-week group. Each week, participants set smaller, weekly goals for themselves to achieve by the next group meeting. The group moderator did not share in the goal setting process. Instead, the role of the moderator was to call the meeting to order, set the agenda for the session, ensure all group members were respectful of one another, and keep time for the group to make sure it ended on time. Groups met for one hour weekly for a six week time period.

# Sampling

The University Counseling Center aims to enroll 15 participants in each support group in order to ensure that group members perceive an extensive support network without feeling that the group is too big for contributions to be acknowledged. Kenny, Kashy, and Cook (2006) estimated the number of groups required for .80 statistical power for SRM parameter estimates by research design type. The authors recommended that five groups of twelve participants should provide .80 statistical power. Thus, the Counseling Center offered six online graduate support groups, and an effort was made to fill each group in order to allow for attrition without compromising power.

Participants were recruited through a flier e-mailed one week before the start of the support groups through the Graduate School at Michigan State University. It was sent to all graduate students to advertise online doctoral support groups offered by the Counseling Center for doctoral students who are feeling overwhelmed with their workload. Due to low enrollment rates, the start date was pushed back one week and the flier was re-sent, this time inviting Master's students as well.

## **Participants**

Participants were students enrolled in graduate programs at Michigan State University. Seventy-three participants initially enrolled in groups before the first meeting. Forty-nine of the members who registered attended their first group meeting; Thirty-five attended meeting two; Twenty-three attended meeting three; Twenty-three attended meeting four; Twenty-eight attended meeting five; and twenty attended meeting six. Group six was cancelled after the third meeting week because no group members logged in for two weeks in a row. Thirty-nine participants answered the survey distributed after week one; Thirty participants answered the survey distributed after week three; and
Twenty-three participants answered the survey distributed after week three. Because of potential concerns about privacy, participants were not asked to disclose their personal demographic data until after week six at the end of the experiment. Demographics for each group are reported in Table 1; all tables are in Appendix B.

#### Procedure

In the recruitment flyers, interested students were instructed to contact the Counseling Center to enroll in one of the groups. Participants met with their support group for one hour per week over a six week time period at the same time each week. The same moderator ran all face-to-face and computer-mediated support groups. The moderator was a certified professional that was trained to identify any participants who were thought to be a threat to themselves or others. Under the condition that any participant was thought to be a threat to him or herself or others, the moderator privately contacted the individual and encouraged him or her to seek private counseling through the Counseling Center. Because of this, participants were required to provide their contact information along with their usernames to the group moderator at the Counseling Center. Participants were assured complete confidentiality and were guaranteed that their personal contact information would only be looked up if the group moderator felt that they needed professional help. All procedures were approved by the university's institutional review board.

Participants were asked to complete online surveys through a link sent to them via e-mail at three different time periods: after the first meeting, after week three, and one after week six. Table 5 provides a detailed list of all measures and the times at which the measures were distributed. Participants were asked to provide their usernames at the

beginning of each survey. This was used as a mechanism to match up longitudinal data, as well as tracking participant mortality over the course of the study.

Social Relations Analysis using a round robin design requires that all group members rate each other on all measures. The unit of analysis for the SRM is the dyad, rather than the individual. Table 2 provides a list of each individual (assigned an alphanumerical codename for reporting data) that attended each weekly session, and Table 3 reports which participants answered the survey at each time point. The codenames assigned to participants are the same on both lists and across all time periods.

Participants were required to complete a consent process before taking each of the surveys. Survey completion was optional and voluntary without penalty for refusal to complete surveys. In exchange for survey completion, participants were offered an opportunity to win a \$50.00 gift card after each survey.

In addition to over-recruiting for .80 statistical power, further efforts were made to reduce attrition. First, the experimental nature of the support group assessments was fully disclosed. Data was collected online and participants were regularly reminded to log in and complete the survey if they had not done so. As noted above, in exchange for their participation in each survey, students were entered into a raffle for a \$50 gift card. Despite the researcher's efforts to encourage continued participation, however, the attrition rate for survey completion was high (42%).

#### **Chat Room Interface**

The private online chat rooms that participants logged into for their weekly support group meetings were created using a program called *Simple Machines*, *LLF*, powered by *The Online Institute*. The program was selected because it provides several

options for researcher control over the experiment. First, the program allowed the researcher to create six distinct private groups that required a login name and password to enter. The program offers a function that allows participants to upload a picture that is used to represent them. Participants in visually identifiable conditions were instructed to upload a picture of themselves, which appeared as a thumbnail image next to all of the text that they typed in the chat room. Through the program, the researcher was also able to prevent group members from changing the color of the text that appears when they type, accessing each other's e-mail or contact information, or posting additional information about themselves on their user profiles. See Appendix C for what the chat room interface looked like.

#### Induction

## **Depersonalization.**

In order to induce depersonalization in some groups and not in others, groups were randomly assigned to be visually anonymous or visually identifiable to one another. Participants in the visually identifiable groups were asked to e-mail pictures of themselves to the study coordinator before the first group meeting. The study coordinator uploaded these pictures to participants' profiles so that they appeared next to everything that they posted in the chat group. If group members did not feel comfortable uploading pictures of themselves, they were given the option to choose an image from the Internet that they felt represented them well instead. Under conditions in which people did not send in pictures of themselves, they were assigned pictures of well-known figures, including George Washington, Martin Luther King, Jr., Susan B. Anthony, and the Mona Lisa. Participants were randomly assigned to these pictures, and were not matched for

gender or any other quality. Past research has shown that people assign attributes such as gender to others based on images that are used to represent them, even when the images are non-gendered (e.g., Nowak & Rauh, 2005), and when all group members are made aware that the image used to represent the person has nothing to do with the way they look in real life (Lee, 2004).

Participants who did not turn in pictures were randomly assigned to the images used to represent them (i.e., gender and other physical attributes were not considered to match up with the images used to represent group members). Of all participants who attended online groups six people were represented by images that were not themselves. In group two, two people did not send in pictures of themselves, so they were represented by images of George Washington and the Mona Lisa, respectively. In group four, one person sent in a picture of an outdoor scenic picture of trees, and one person sent in a picture of a gorilla. Finally, in group five, one person did not send in a picture and was represented by a portrait of George Washington. Another person sent in a picture of a smiley face made of food.

Participants in groups that were assigned to be visually anonymous were not asked to send in a picture and no visuals appeared next to their usernames as they spoke in the chat room. These participants were asked to abstain from uploading any pictures to their profiles even for their own personal use. The use of 'picture groups,' versus 'no picture groups' has been used repeatedly to create depersonalized versus individuated groups (e.g., Postmes et al., 2001; Sassenberg & Postmes, 2002; Lee, 2006).

#### Measures

**Outcome-Relevant Involvement.** Johnson and Eagly (1989) described outcomerelevant involvement as the degree to which a participant feels that the outcome of the event has direct implications for him or her. At the beginning of the first survey, all participants were asked to write down their overall goal they hoped to achieve by attending the support groups. If participants were able to state a personal goal they hoped to achieve through their attendance, they were assumed to have a raised level of outcomerelevant involvement with the group.

**Depersonalization.** In order to assess depersonalization, a round robin design was used to measure each participant's perception of all other group members on two characteristics that have been shown to increase persuasiveness: credibility and homophily. Thus, each participant completed the same credibility and homophily items while thinking of each different group member at three different time points (weeks 1, 3, and 6). Participants were instructed to answer each scale one at a time in reference to the username of each other group member. In order to reduce the likelihood of participant fatigue, both scales were shortened; each scale is described in detail in the following sections. See Table 4 for more detail about measure distribution, as well as means and alpha reliabilities for each scale at each time point.

*Homophily.* Participants' perceptions of the degree to which their fellow group members were similar to them (i.e., homophily) were measured using two 7-point, semantic differential items from McCroskey, Richmond, & Daly's (1975) homophily scale. Both items were taken from the 'attitude homophily' dimension of the scale. Items included: 'is similar to me – is different from me,' and 'is like me – is unlike me.' Items were reverse-scored so that a higher score indicated the perception of greater homophily.

Evidence for the item's construct validity embedded in a longer scale was found by Maloney (2010) using CFA procedures. Homophily items are reported in Appendix D.

*Credibility.* Participants' assessments of source credibility were measured with items from McCroskey and Teven's (1999) source credibility scale. The original scale is composed of 18 7-point semantic differential items that were created to fit a 3-factor solution of source credibility. The three factors are: *competence* (which includes adjectives such as 'expert – inexpert'), *goodwill* (which includes descriptors such as 'cares about me – does not care about me'); and *trustworthiness* (which includes adjectives such as 'trustworthy – untrustworthy'). Items were reverse-scored so that higher scores were indicative of greater perceptions of credibility. Three items from each dimension were selected to be used in this study based on previous evidence for scale validity (Van Der Heide, 2009). One item from each dimension was dropped from analysis for the present study in order to increase the alpha-reliability of the scale. Items are listed in Appendix E.

**Confidence in Graduate School Advice Provided by an Individual.** The level of confidence each participant would have in graduate school advice provided by each other group member was measured using a single item that was added to the series of credibility and homphily questions asked regarding each group member in survey six. The item stated, "How confident would you be in graduate school advice provided by (group member username)?" and was measured on a 7-point scale ranging from 1 (not at all confident) to 7 (extremely confident). The scale's midpoint (4) was labeled as 'somewhat confident.' Higher scores indicate greater confidence. The item is provided in Appendix F.

#### Results

#### **Outcome-Relevant Involvement**

All participants were able to list a personal goal that they hoped to achieve through attending the online graduate student support group. Therefore, outcomerelevant involvement levels were deemed appropriately high.

# Analysis Procedures

All hypotheses and research questions 1-6 were examined using the Social Relations Analysis. Statistical Package for the Social Sciences (SPSS) software was used to estimate the model in accordance with the steps provided by Kenny (2007). All syntax used for model estimation is provided in the previously mentioned description of SRA in Appendix A. The program conducts significance tests on variance components by calculating a Wald statistic and testing the null hypothesis that the variance explained by the component of interest is within sampling error of zero.

The purpose of social relations analysis is to explain variance on a dependent variable in a single sample, as opposed to more traditional statistical analyses, which seek to examine covariance of data from separate samples on dependent variables. Thus, SRA was conducted on visually anonymous and visually identifiable groups separately, and then the two types of groups were compared by examining patterns of significant variance components at the same and different time points.

In order to be able to compare changes in variance attributable to judge, target, group, and relationship/error variances over time, only participants who completed the survey at all three time points were included in the analysis. Thus, the judges in each group were the same for all three time points so that changes in variance structure over

time was not confounded with different judges rating group members at different time points. It should be noted, however, that actual reported percentages should not be compared across times, as each percentage reported is the proportion of the total variance created on the DV at that particular time point. For example, a judge variance may be .25 both at time 1 and at time 2, and it may be significant at one of those times and not at another. This is because the total variance on the DV may be much larger at one time than at another time, so 25% of a very small overall variance may not be statistically greater than zero variance, but 25% of a large overall variance will be significant. The significance test also controls for group size by shifting the level of analysis from the dyad to the group to test for the statistical difference from zero. This way, larger groups are not weighted more than smaller groups in the tests for significant variance components. A simplified summary of each hypothesis and whether or not it was supported by data for visually anonymous and visually identifiable groups is provided in Table 6.

Hypothesis 1 predicted that at time 1, participants in visually anonymous conditions would demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived (a) competence (b) trustworthiness (c) goodwill and (d) homophily of group members, than participants in visually identifiable conditions. Target variance did not explain a significant amount of variance across any ratings at any time point. Therefore, a statistically significant judge variance in any condition will be taken as an indicator of SRA assimilation for the rest of this analysis. Table 7 reports percentages of variance accounted for by each component relative to the other components for each of the four dependent variables. Also, although

mean scores are not the focus of this analysis, the mean scores for each attribute broken out by groups over time are reported in Table 8.

The analyses conducted to examine assimilation at time 1 yielded no significant judge variance in competence ratings (and therefore no SRA assimilation) in visually anonymous groups, and significant judge variance in visually identifiable groups at time 1. This means that there was more assimilation in visually identifiable groups than in visually anonymous groups—the opposite of what was predicted. Therefore, the data were not consistent with H1a.

H1b predicted greater SRA assimilation for trustworthiness in the visually anonymous condition than the visually identifiable condition at time 1. SRA revealed significant judge variances in both visually anonymous and visually identifiable groups. Because the total variances to which judge variances are contributing are different, the degree of SRA assimilation demonstrated by visually anonymous judges versus visually identifiable judges cannot be compared directly. The significant judge variance in both group types indicates that SRA assimilation took place in judges' ratings of their group members' trustworthiness, regardless of whether they had pictures of their group members or not, and the data were not consistent with H1b

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H1c predicted that participants in visually anonymous conditions would demonstrate a greater degree of SRA assimilation in ratings of goodwill than participants in visually identifiable conditions at time 1. Contrary to H1c, SRA results showed no significant judge variance (meaning no SRA assimilation) for goodwill in either the visually anonymous or the visually identifiable groups. Therefore, the data were not consistent with H1c.

H1d predicted that participants in visually anonymous conditions would demonstrate a greater degree of SRA assimilation in ratings of homophily than participants in visually identifiable groups at time 1. Results indicated no significant judge variance for visually anonymous or visually identifiable groups. Therefore, no SRA assimilation occurred in either group, and the data were not consistent with H1d.

In the main, analyses performed to test H1 indicated that the data were not consistent with the SIDE assumption that participants in visually anonymous groups will experience depersonalization, and participants in visually identifiable groups will not. The only variable on which participants in visually anonymous groups seemed to experience depersonalization (as represented by SRA assimilation) was trustworthiness. However, participants in the visually identifiable condition also experienced depersonalization in their perceptions of their group members' trustworthiness. Participants did not appear to experience depersonalization in their perceptions of goodwill or homophily in either visually anonymous or visually identifiable conditions. For perceptions of competence, ratings provided by participants in visually identifiable groups reflected depersonalization, and ratings provided by participants in visually anonymous groups did not.

H2a predicted a decrease in SRA assimilation for ratings of competence from time 1 to time 2. Recall that SRA assimilation is represented by low target variance and high judge variance, and that target variance was not significant for any of the dependent variables at any of the three time periods. Therefore, H2 examined changes in significance of judge variance to represent SRA assimilation from time 1 to time 2. Visually anonymous groups did not demonstrate SRA assimilation for competence at time 1. Judge variance was significant for ratings of competence in visually anonymous groups at time 2, however, indicating SRA assimilation in judges' ratings. This pattern is in the opposite direction of what the SIP hypothesis predicted. For visually identifiable groups, judge variance in ratings on competence at time 1 and at time 2 were both significant. Thus, there is no evidence for a decrease in SRA assimilation from time 1 to time 2 for judges' ratings of their group members' competence, and the data were not consistent with H2a.

H2b predicted that SRA assimilation for ratings of trustworthiness would decrease from time 1 to time 2. Consistent with this hypothesis, judge variance (i.e., SRA assimilation) was significant at time 1, and was not significant at time 2 in visually anonymous groups, indicating a decrease in total variance explained due to SRA assimilation in judge ratings of trustworthiness. Therefore, for visually anonymous groups, the data were consistent with the hypothesis. The pattern predicted by H2b did not emerge for visually identifiable groups. Judge variance was significant for ratings of trustworthiness in visually identifiable groups at time 1, and it remained significant at time 2, meaning that SRA assimilation in judge ratings persisted through time 2, and data for visually identifiable groups were not consistent with H2b. H2c predicted a decrease in SRA assimilation for ratings of goodwill from time 1 to time 2. Contrary to the prediction of H2c, judge variance for goodwill in visually anonymous groups was not significant at time 1, but was significant at time 2. This pattern was not predicted by the hypothesis. In visually identifiable conditions, judge variance for ratings of goodwill were not significant at time 1 or time 2, indicating that SRA assimilation was not demonstrated at time 1, and it remained low at time 2. Thus, data were not consistent with H2c for visually anonymous or visually identifiable groups.

H2d stated that SRA assimilation for ratings of homophily would decrease from time 1 to time 2. For both visually anonymous and visually identifiable conditions, no significant judge variances emerged for perceptions of homophily at time 1 or at time 2. Therefore, because there was no initial demonstration of SRA assimilation to decrease, the data were not consistent with H2d in visually anonymous or visually identifiable groups.

To summarize, support for hypothesis 2 was mixed. For visually anonymous groups, the data were only consistent with the hypothesis that SRA assimilation would decrease from time 1 to time 2 for trustworthiness. This means that participants' ratings of one another appeared as though they were depersonalized to one another at time one, and not at time 2. This is consistent with the SIP assertion that participants become less depersonalized to one another over time.

The opposite occurred for participants in visually anonymous groups' ratings of competence and goodwill. At time 1, participants in visually anonymous groups rated group members differently from one another for the dependent variables competence and goodwill. At time two, these participants gave their group members more similar ratings

on the attributes of competence and goodwill. In terms of depersonalization, this finding in contrast with the prediction drawn from SIP because participants in visually anonymous groups' ratings of one another on competence and goodwill appeared as though they *were not* depersonalized at time 1, but they *were* depersonalized to one another at time 2.

Inconsistent with the SIDE assumption of depersonalization, participants in visually anonymous groups did not demonstrate any sign of depersonalization through SRA assimilation at time 1 or at time 2. This finding is not necessarily in contradiction to SIP, but there is not enough information to support the notion of greater identifiability over time either.

In visually identifiable groups, there did not appear to be much of a change in the way participants rated their group members in comparison to each other from time 1 to time 2. Participants in visually identifiable groups demonstrated SRA assimilation at both times 1 and 2 for competence and trustworthiness. This is consistent with SIDE predictions for *visually anonymous* groups that participants will be depersonalized to one another and that depersonalization will persist over time, but not for *visually identifiable* groups. Therefore, the data are not consistent with the hypothesis.

Participants in visually identifiable groups did not demonstrate depersonalization at times 1 or 2 for goodwill and homophily. Therefore, participants appeared to distinguish their group members from one another on both of these dependent variables.

H3 predicted decreases in SRA assimilation from Time 2 to Time 3 for each of the four dependent variables. H3a predicted that SRA assimilation for ratings of competence would decrease from time 2 to time 3 across both visually anonymous and

visually identifiable conditions. For visually anonymous groups, the data were consistent with H3a. Judge variance was significant at time 2, and not at time 3. For visually identifiable groups, however, SRA judge variance for ratings of perceived competence was significant at time 2, and remained significant at time 3. This means that there was no sign of a decrease in SRA assimilation for visually identifiable groups from time 2 to time 3, and the data were not consistent with H3a in visually identifiable groups. Therefore, the data were consistent with H3a in visually anonymous groups, but not in visually identifiable groups. H3b predicted a decrease in SRA assimilation for ratings of trustworthiness from time 2 to time 3. For visually anonymous groups, judge variance was not significant at time 2 or time 3. Because there was no indication of SRA assimilation at time 2, a non-significant judge variance at time 3 does not necessarily indicate decreased SRA assimilation, and the data were not consistent with H3b. For visually identifiable groups, however, as predicted in H3b, judge variance in perceptions of trustworthiness was significant at time 2, and was not significant at time 3, signifying a decrease in SRA assimilation. Therefore, the data were consistent with H3b for visually identifiable groups, but not for visually anonymous groups.

H3c stated that ratings of goodwill in visually anonymous and visually identifiable conditions would decrease in SRA assimilation from time 2 to time 3. Consistent with this hypothesis, judge variance for goodwill in the visually anonymous condition was significant at time 2, and was not significant at time 3. This signifies a decrease in SRA assimilation, and the data for visually anonymous groups was consistent with H3c. Judge variance for ratings of perceived goodwill in visually identifiable groups was not significant at time 2 or at time 3. Because there was no indication of SRA

assimilation at time 2, a non-significant judge variance at time 3 does not necessarily indicate decreased SRA assimilation, and the data for visually identifiable groups were not consistent with H3c.

Finally, H3d predicted that across both groups, SRA assimilation would decrease from time 2 to time 3 for homophily. Judge variance for homophily was not significant at time 2 or at time 3 for either group type. Therefore, because there was no evidence for SRA assimilation at time two, non-significant judge variance cannot be interpreted as a *decrease* in SRA assimilation, and the data in both visually anonymous and visually identifiable groups were not consistent with H3d.

In sum, support for H3 was mixed as well. For visually anonymous groups, the data were consistent with the hypothesis that depersonalization should decrease over time for the variables of perceived competence and goodwill. For trustworthiness and homophily, visually anonymous groups did not demonstrate depersonalization at time 2 or time 3. Thus, visually anonymous groups did not behave in a manner that was opposite of the prediction that depersonalization should decrease over time, but there is no evidence for a clear decrease in depersonalization from time 2 to time 3 either. For visually identifiable groups, the data were consistent with the hypothesis that depersonalization should decrease over time for trustworthiness. For competence, depersonalization was demonstrated in visually identifiable groups both at time 2 and at time 3. This is not consistent with the hypothesis that depersonalization should decrease over time. Finally, for homophily and goodwill, visually identifiable group ratings did not demonstrate depersonalization at time 2 or time 3. This is not a finding in the opposite

direction of the prediction, but there is no evidence of a clear decrease in depersonalization from time 2 to time 3 either.

RQ's 1-6 examined whether judge or target variances contribute significantly to variance explained in perceptions of CMSG group members regarding each of the four variables assessed over time. The same SRA procedures used to test H's 1 and 2 were used to answer RQ's 1-6. Recall that Table 7 provides the relative partitioning of variance components for visually anonymous and visually identifiable groups regarding each variable at all three time points. Significant judge variance is generally interpreted as a sign of SRA assimilation, in which the ratings that group members receive are a function of personality characteristics of the judge rather than those of the person being rated. Significant target variance is generally interpreted as a sign of SRA consensus, in which the ratings that group members receive are a function of the attributes demonstrated by the targets themselves.

RQ1 addressed whether judge variance contributed significantly to explain total variance in perceived competence among CMSG group members. SRA results revealed that judge variance contributed significantly to total variance in times 2 and 3, but not time 1 in visually anonymous groups. For visually identifiable groups, judge variance explained a significant amount of variance in competence ratings across all time periods.

RQ2 investigated whether target variance contributed significantly to explain total variance in perceived competence among CMSG group members. Target variance was not significant in either group type at any time period. Thus, target variance does not

contribute significantly to variance explained on any of the DV's at any time point, and will no longer be addressed in this analysis (i.e., RQ4, RQ6, RQ8).

RQ3 examined whether judge variance contributed significantly to variance explained in trustworthiness. According to the analysis, judge variance contributed significantly to total variance in visually anonymous groups at time one only. Judge variance contributed significantly to total variance in visually identifiable groups at times 1 and 2, but not at time 3.

RQ5 asked whether judge variance contributed significantly to total variance explained in goodwill. Results indicated that the only significant judge variance in both group types across all time periods was in the visually anonymous condition at time 2.

RQ7 asked whether judge variance contributed significantly to total variance explained in homophily. The SRA revealed that judge variance did not contribute significantly to total variance in homophily in either group type at any time point.

RQ9 asked whether the factors proposed above (perceived competence, trustworthiness, goodwill, and homophily) contributed significantly to participants' confidence in advice provided by specific members of their group. SPSS was used to perform linear mixed modeling to answer this research question. SPSS MIXED is more appropriate for analysis of this dataset than traditional GLM because it is capable of handling correlated data (that arises from repeated measures) and unequal variances (SPSS, 2002). The research question asks whether perceived competence, trustworthiness, goodwill, or homophily are important predictors of confidence in graduate school advice provided in the group. Participants' ratings of confidence in graduate school advice provided by a group member was entered into the model as the dependent variable, and

perceived competence, trustworthiness, goodwill, and homophily were entered as fixed effects. Group, actor, partner, and dyad were entered as random variables to control for nesting and repeated measures. Syntax used to conduct this analysis is provided in Appendix G.

For visually anonymous groups, results indicated that perceived competence,  $\beta = .68$ , t(43.79) = 4.84, p < .001, and goodwill,  $\beta = -.19$ , t(55.59) = -4.42, p < .001, were significant predictors of confidence in graduate school advice, and perceived homophily,  $\beta = .13$ , t(75.51) = 1.43, p = .158, and trustworthiness,  $\beta = -.14$ , t(64.82) = -.93, p = .354, were not. This means that as perceptions of an individual's competence increases, so does confidence in advice provided by him or her. As perceptions of an individual's goodwill increases, confidence in advice provided by that individual decreases.

For visually identifiable groups, perceptions of homophily  $\beta = .40$ , t(81.89) = 2.47, p = .016, and goodwill,  $\beta = -.19$ , t(83.29) = -2.40, p = .019, significantly predicted confidence in graduate school advice provided by an individual. Perceived competence,  $\beta = .20$ , t(85.03) = 1.12, p = .266, trustworthiness,  $\beta = -.02$ , t(80.68) = -.144, p = .886, did not significantly predict confidence in advice provided by an individual within the group. In visually identifiable groups, as perceptions that another group member is similar to oneself increases, so does confidence in graduate school advice provided by that group member. As the perception of goodwill increases, confidence in graduate school advice provided decreases.

#### Discussion

This paper provides insight into the process of social influence in CMSG's by presenting findings from a social relations analysis on data collected from members of

real-world graduate student support groups over the course of a six week period. H1a predicted greater SRA assimilation for competence in the visually anonymous condition than the visually identifiable condition at time 1. Data were not consistent with this hypothesis because significant judge variance was in the opposite direction of what the hypothesis predicted.

H1b predicted greater SRA assimilation for trustworthiness in the visually anonymous condition than the visually identifiable condition. Data were not consistent with this hypothesis because both group types showed evidence of SRA assimilation, regardless of whether they had pictures of one another or not.

H1c predicted that participants in visually anonymous conditions would demonstrate a greater degree of SRA assimilation in ratings of goodwill than participants in visually identifiable conditions. The data were not consistent with this hypothesis because neither group type demonstrated SRA assimilation at time 1, regardless of whether they had pictures of one another or not.

H1d predicted that participants in visually anonymous conditions would demonstrate a greater degree of SRA assimilation in ratings of homophily than participants in visually identifiable conditions. Analyses indicated that the data were not consistent with this hypothesis because, like ratings of goodwill, no significant judge variance emerged in ratings of homophily, regardless of whether they had pictures of each other or not.

Taken together, the results of analyses for H1 are largely inconsistent with SIDE. SIDE is based on the notion that depersonalization stems in a large part from a lack of visual representation among group members. Tests of SIDE assume that providing

individuals with pictures of their group members causes them to individuate and distinguish among one another. Recall that SRA assimilation is the statistical equivalent of depersonalization. Results show that participants in visually anonymous conditions did not exhibit depersonalization in their ratings of each other for any of the dependent variables at time 1 except for ratings of trustworthiness. However, participants in visually identifiable conditions exhibited depersonalization on this DV as well. For perceptions of competence, results demonstrated the exact opposite of what would be predicted by SIDE. Participants in visually identifiable groups exhibited depersonalization in their ratings and participants in visually anonymous groups did not. Finally, neither group appeared to be depersonalized to one another in their initial ratings of homophily and goodwill. This suggests that perhaps people feel better able to make judgments about others' similarity to themselves and the goodwill of their intentions based on less information than they need to make judgments about competence and trustworthiness. The finding about goodwill may be specific to support groups, as participants may assume that all people have one another's best interest at heart in a support group.

The fact that participants in visually identifiable groups were depersonalized to each other more often than participants in visually anonymous groups suggests that depersonalization is not a function of visual anonymity. Social information processing theory suggests that our ability to distinguish among one another on particular attributes is a product of information exchange through communication among group members. If this is the case, then as time passes and more information about group members is accumulated through group discussion, any evidence of depersonalization (as indicated

by SRA assimilation) should decrease over time. Hypotheses 2 and 3 were put forth in line with this reasoning.

H2a predicted a decrease in SRA assimilation for ratings of competence from time 1 to time 2. Data were not consistent with this hypothesis. In visually anonymous groups, the opposite happened- judge variance went from being non-significant in time 1 to significant in time 2. In visually identifiable groups, judge variance remained significant from time 1 to time 2.

H2b predicted that SRA assimilation for ratings of trustworthiness would decrease from time 1 to time 2. The data were consistent with the hypothesis for visually anonymous groups. For visually identifiable groups, significant judge variance for ratings of trustworthiness at time 1 remained significant at time 2.

H2c predicted a significant decrease in SRA assimilation for ratings of goodwill from time 1 to time 2. The opposite happened for visually anonymous groups. Judge variance for ratings on goodwill was not significant at time 1, and it became significant at time 2. In visually identifiable conditions, judge variance for ratings of goodwill was not significant at time 1 and did not become significant at time 2.

H2d stated that SRA assimilation for ratings of homophily would decrease from time 1 to time 2. Results showed that participants in both types of groups did not demonstrate SRA assimilation in their judgments of group member homophily at either time point. Implications of the findings from H2 will be considered in combination with the findings from H3.

H3a predicted that SRA assimilation for ratings of competence would decrease from time 2 to time 3 across both visually anonymous and visually identifiable conditions.

Data was consistent with this hypothesis for visually anonymous groups. For visually identifiable groups, the trend of SRA assimilation on ratings of competence continued from time 2 to time 3.

H3b predicted a decrease in SRA assimilation for ratings of trustworthiness from time 2 to time 3. Results of the analyses showed that participants in visually anonymous groups did not demonstrate SRA assimilation in ratings of trustworthiness at time 2 or at time 3. Data were consistent with the hypothesis for visually identifiable groups.

H3c stated that ratings of goodwill in visually anonymous and visually identifiable conditions would decrease in SRA assimilation from time 2 to time 3. Data were consistent with the hypothesis for visually anonymous groups. For visually identifiable groups, there was no SRA assimilation displayed in ratings of group members' goodwill at times 2 or 3.

Finally, H3d predicted that across both groups, SRA assimilation would decrease from time 2 to time 3 for homophily. Neither group type demonstrated SRA assimilation in their ratings of each others' homophily at any time point during the study.

In sum, support for hypotheses 2 and 3 was mixed. Due to the nature of the analysis producing results that are all relative to separate total variances, the degree of assimilation (or depersonalization) exhibited by different groups or the same groups at different time points could not be compared to one another. Because of this, conclusions about changes in variance over time can only be drawn if variance levels are significant at one time point and not significant at the time point immediately before or after it. Therefore, would be impossible for data to be consistent with both H2 and H3 at the same time on any given attribute, and not all data that are not consistent with the hypothesis are

necessarily inconsistent with SIP theory. For example, H2 predicts a decrease in SRA assimilation over time represented by significant judge variance at time 1 and non-significant judge variance in time 2. H3 predicts a decrease in SRA assimilation over time represented by significant judge variance at time 2 and non-significant judge variance in time 3. Thus, if H2 was supported, and judge variance was not significant at time 2. Significance at time 2, however, is a requirement for support of H3 at time 3.

Results show some instances in which judge variance is significant at one point in time and not at a subsequent time point. This occurred for trustworthiness in visually anonymous groups from time 1 to time 2, and for visually identifiable groups from time 2 to time 3. Thus, it appears that the data were consistent with the hypothesis derived from SIP regarding ratings of trustworthiness. The fact that it took longer for depersonalization to disappear in visually identifiable groups than visually anonymous groups may be a function of group size. More people participated in visually identifiable groups than visually anonymous groups, leaving less time for each individual to self-disclose in the hour long support group meetings. Although group size is controlled for in calculating variance estimates across groups, the abovementioned limitation due to group size is a function of the number of people who showed up for the actual support group sessions, as opposed to the number of people who answered the survey.

Another explanation for this finding can be drawn from Berger and Calabrese's (1975) uncertainty reduction theory, which states that human beings use communication methods to reduce uncertainty about others upon meeting them. It may be that visual anonymity led to greater uncertainty about the trustworthiness of group members, and therefore, participants made greater efforts to gather information about their group

members, leading to a more rapid decline in SRA assimilation (i.e., depersonalization) on ratings of trustworthiness when group members were visually anonymous to one another than when they were visually identifiable.

In some cases, data demonstrated the opposite of the predictions drawn from SIP. For example, judge variance increased in perceptions of competence and goodwill in visually anonymous groups from time 1 to time 2. Consistent with SIP, however, SRA assimilation decreased from time 2 to time 3. It is possible that it took time for participants to develop a salient group identity due to the lack of visual cues. It may be the case that after time passed, and group members began to bond, they began to see each other more similarly. Then, after even more time passed, consistent with SIP theory, group members were able to gather enough individual information about each group member to distinguish among them in terms of competence and goodwill.

RQ's 1-6 addressed whether judge or target variances contributed significantly to variance explained in perceptions of CMSG group members regarding each of the four variables assessed over time. The fact that judge variance was significant numerous times across different variables and time points, and target variance was not significant at any point on any variable suggests that personal characteristics of information receivers may be driving perceptions of sources more so than actual characteristics of sources themselves. If this is the case, perhaps researchers should concentrate more on the characteristics and behaviors of the health information seeker (such as levels of involvement, education, etc.) when trying to understand influence in online health discussion boards and support groups, rather than trying to locate any universal cues given off by the source of the information to boost their credibility. The lack of statistical

significance in some variances also suggests that future research should include a nuanced examination of relationship variance, separate from error variance, and search for common characteristics about particular relationships that drive individuals to rate each other differently than other people in the group<sup>ii</sup>.

RQ9 asked whether the factors proposed above (perceived competence, trustworthiness, goodwill, and homophily) contributed significantly to participants' confidence in advice provided by specific members of their group. Results were interesting in that they were not the same for visually anonymous and visually identifiable groups. The analyses indicated that that in visually anonymous groups, perceived competence, and goodwill had significant impacts on confidence in graduate school advice provided by an individual within the group. Perceived trustworthiness and homophily did not. Ratings of competence were positively related to confidence in advice provided in the support group, and goodwill is negatively associated with it. In the visually identifiable condition, homophily positively influenced ratings of confidence, and goodwill was once again a negative predictor.

The only attribute that was negatively associated with confidence in graduate school advice provided by a fellow support group member was goodwill. The items used to measure goodwill ("has my interest at heart" and "is concerned with me") may have led individuals to feel that person who possesses such caring qualities might not have the heart to provide criticisms or sound advice that may be difficult to hear. Interestingly, goodwill as a negative predictor of confidence in graduate school advice provided within the group was the only variable that was significant in both visually anonymous and visually identifiable conditions.

The difference between the two groups in competence and homophily as significant predictors may have to do with visual anonymity or identifiability, but more likely it had to do with the composition of the groups themselves. By time three, only 26 people responded to the survey. The vast majority of responses came from groups 1 (visually anonymous) and 4 (visually identifiable). As a whole, the people in group 1 seemed to be a bit older, and to have less of a social connection with other students and faculty within their own departments. Thus, people in this group may have developed more of a common identity over their positions as older, non-traditional students trying to earn Ph.D.'s, so differences in homophily among members may not have been as obvious, and perceived competence was more valued. Members of group 4 seemed a bit more heterogenous. The age ranged from early twenties to late fifties, and several members of the group mentioned other social outlets that they often use for stress management. Thus, it is possible that the perception that a group member is very similar to oneself was a better predictor in the latter group because they felt that certain members of the group could understand their personal situation better than others who are not at the same place in life as they are. This finding speaks to the importance of considering the characteristics of the information seeker when trying to predict influence in online health information exchange settings.

# Limitations

The previously-noted low power for this analysis is perhaps the greatest limitation of this study. Although the researchers made extensive efforts to recruit enough participants to ensure an adequately-powered study, even with attrition, longitudinal field experiments are can be limited by participant attrition (Cook & Campbell, 1979). The

purpose of using a real-world support group was to examine social influence processes among participants with naturally high levels of outcome-relevant involvement and a relevant shared social category. The researcher was interested in the applicability of CMC theory to real-world support settings. Because of this, it was important for support group participants to continue attending group meetings at their own volition, as opposed to feeling coerced into participating with the promise of extremely large incentives. The fact that several significant proportions of variance were detected given the statistical power limitation suggests that effects for this analysis are large, and that further investigation into this line of research is warranted. In line with this rationale, it is also possible that several trends went undetected due to the limited power of the study.

Because a goal of this study was to examine perceptions over time, only group members who answered surveys at all three time points were included in the analysis. It is possible that there are systematic commonalities shared by participants who remained in the groups over time and answered all surveys. Thus, results here are not generalizable to all participants who signed up for, and attended some, or even most, support groups.

Another limitation to this study was the use of shortened scales of two or three items, rather than four indicators of each variable so that confirmatory factor analysis procedures could be performed. One item had to be dropped from each of the credibility dimensions in order to increase alpha-reliability of the measures, and still some reliabilities were relatively low. Less reliable measures make interpretation of results less certain. Because all scales ended up containing two items each, the method for separating error variance from relationship variance by splitting a measure in half and correlating the variances of the two halves of the measure to get the stable relationship variance

(unconfounded by error) is less viable. Single item measures are not generally accepted as valid measurement. Nonetheless, given that the study predictions did not address relationship variance, the researcher felt that it was important to keep scales short in order to decrease the length of the survey. A shorter survey decreases the chances for participant fatigue and differences in variance due to fatigue and frustration instead of actual differences in perceptions.

It was considered also that having a shorter survey might increase participants' response rates. The study sample is composed of graduate students who were stressed enough that they enrolled in an online support group. If these individuals were having time management issues, it is unlikely that they would participate in a survey that takes more than a few minutes of their time. Despite efforts to retain participants, the attrition rate was high. Future studies of real-world support groups should consider the sample population and whether they are particularly susceptible to dropping out of the study due to lack of time or health problems. If they are, researchers should make an effort to recruit almost double the number of participants required to provide appropriate power to detect effects using SRA.

One final limitation to the present study is that the SPSS program that was used to perform the SRA is limited in that it assumes positive covariance between judge and target variances. If the variance happens to be negative (i.e., as the percentage of judge variance goes up, the percentage of target variance goes down, or vice versa), the program will not provide a percentage variance estimate. However, the SPSS program was also advantageous in that it allows for missing data, whereas traditional SRA software that does not assume positive covariance of judge and target variances, such as

Kenny's SOREMO program, allows for no missing data, so participants whose data are missing several answers must be deleted. The ability to retain participants who provided even some responses was a benefit that was crucial for a dataset from a field experiment with lots of missing data and concerns about dropping additional participants due to low power.<sup>iii</sup>

# **Future Research and Analyses**

The greatest theoretical contributions made by this study stem from the use of social relations analysis to examine SIDE and SIP-based predictions about online support groups. Using social relations analysis is a profitable area for future research involving online support groups. Early theorizing about social information processing drew from the uncertainty reduction theory proposition that as uncertainty reduces, liking increases (Berger & Calabrese). Because people cannot always be expected to judge others more positively as they get to know them better, SIP researchers can use SRA to identify greater variance in ratings of others over time, caused by both more positive and negative ratings, rather than only increasingly positive scores over time. Because of the limitations of the present project noted above, such as a lack of statistical power and an inability to disentangle relationship from error variance, this area of research could benefit from additional studies that use the SRA method on groups over time.

The fact that the data did not indicate depersonalization for visually anonymous groups at time one may be viewed as further support for the Maloney (2010) suggestion that apparent consistency with the concept of depersonalization in visually anonymous online groups may have been an experimental artifact produced by alternative factors such as low levels of involvement and an unequal number of available heuristic cues

across conditions. In order to test this, future research may use an experimental design to compare visually anonymous and visually identifiable support groups to other visually anonymous and visually identifiable groups.

It is also possible, however, that the graduate student support groups investigated in this study failed to provide optimal conditions for SIDE processes to occur. One way to demonstrate that the online support group conditions favored SIDE processes may be to examine how judges rated objective differences across groups, such as the demographic make-up of the group. SIDE posits that visually anonymous groups are unmotivated to detect differences across individual group members, and that the visual cue of a photograph motivates participants to learn more about one another as individuals. If this is the case, researchers may be able to detect this process by comparing judge variance in ratings of homophily in a particular group to a composite of demographic differences provided by group members.

The current project also produced additional data that may be analyzed to shed further light onto social influence processes within groups. For example, transcripts from group meetings can be content analyzed for differences in types of support provided, information exchanged, advice offered, and group versus individual-level pronouns. Findings may help to bolster certain claims made based on the analyses that have been conducted thus far.

#### Footnotes

<sup>1</sup> It is possible when judge variances are both significant or both not significant that the variances are still significantly different from *each other*. However, the creators of the SRA method are currently unaware of a test of significance to compare proportions of two different variances relative to each other (Kenny, 2010). Therefore, this paper does not attempt to compare two significant or non-significant judge variances relative to each other, and instead only draws conclusions based on significant variance versus non-significant variance.

<sup>2</sup> When continuous independent variables are entered as fixed effects, each score obtained through participants' averaged scale on the attribute is listed as a category. This information is not as meaningful to readers as the effect sized provided by listing the variables as covariates as well.

<sup>3</sup> In order to separate relationship variance, a researcher must have either multiple measures of the same attribute on different scales or the same scale over time. The true relationship variance, separated from error is the correlation between the two measures of a particular type of variance for a particular attribute. Although the present data set included longitudinal repeated measures of the same attributes, it was not ideal for examining relationship variance because the hypotheses of these studies suggested that changes in variance over time is a function of getting to know one's group members, as opposed to error. Thus, according to this rationale, uncorrelated relationship variance should not be assumed to be error.

<sup>4</sup> The costs and benefits of using SOREMO versus traditional statistical software was discussed with one of the creators of the SRA method, Dr. Deborah Kashy, of Michigan State University. Dr. Kashy emphasized the importance of power in this experiment, and recommended retaining participants by using traditional statistical software such as SPSS. In order to make this decision, all eligible data (data with no missing values) was run through SOREMO to conduct SRA. SRA using SPSS was then conducted on the same dataset. The two programs yielded very similar results that only differed slightly due to differing estimation methods used by the programs.

# Appendix A.

Social Relations Analysis Process

- Structure: round-robin design (every member of the group interacts with or rates every other individual in the group; requires that each dyad provides two scores, one for each person).
  - The math for a block design is slightly simpler, but it would be inappropriate for this study.
- In the SRM, each dyadic score is a function of four components:

Example (the dyad of Allison and Beth on scores for extroversion and disclosure; from Kenny, Kashy, & Cook, 2006, p. 191):

Allison's		Group		Allison's		Beth's		Allison's
rating of		Mean for		tendency to		tendency to		unique
Beth's	=	extroversion	+	see others	+	be seen as	+	perception
extroversion		(group		as		extroverted		of Beth's
		effects)		extroverted		(partner/target		extroversion
				(actor/judge		effect)		(relationship
				effect)				effect)
Allison's		Group		Allison's		Beth's		Allison's
level of		Mean for		tendency to		tendency to		unique
self-	Ξ	self-	+	self-	+	elicit self-	+	amount of
disclosure		disclosure		disclose		disclosure to		self-
with Beth		(group		with others		others		disclosure

effect)	(actor/judge	(partner/target	to Beth		
	effect)	effect)	(relationship		
			effect)		

- Effects:
  - Actor/judge Effects: "...the extent to which a perceiver sees targets as high or low on the trait" (Kenny, 1994, p. 18)
  - Partner Effects: "...the extent to which a target is seen by perceivers as high or low on the trait" (Kenny, 1994, p. 18).
  - Relationship Effects: "...the degree to which a given perceiver sees a given target as high or low on the trait, with perceiver and target effects controlled" (Kenny, 1994, p. 18).
    - NOTE: relationship effects are confounded with error. In social relations analysis, though, researchers are not concerned with effects—they are concerned with variances. Effects just need to be calculated in order to calculate variances from them. Relationship variance can be separated from error variance. This will be discussed when partitioning actor, partner, and relationship variances is discussed.
- "The focus of an SRM study is not who has a larger actor effect but on the extent to which individuals differ in their actor effects... One common mistake in presentations of SRM is to confuse effect estimates and variances. When referring to a particular score, the term *effect* should be used. A person might have a large

actor effect but not a large actor variance. When referring across persons or results from a study, one is not referring to actor effects, but to actor variance" (Kenny, Kashy, & Cook, 2006, p. 199).

• SRM equation:

 $X_{ij} = M + a_i + b_j + g_{ij}$ 

- $\circ$   $X_{ij}$  = the score for person *i* rating (or behaving with) person *j*
- $\circ$  M = the group mean
- $a_i$  = the person *i*'s actor effect
- $b_j$  = the person j's partner effect
- $\circ$   $g_{ij}$  = the relationship effect
- *a*, *b*, and *g* are random variables
- SRM analysis focuses on the variance of these three random variables
- <u>Problem:</u> the equation does not allow for the separation of relationship variance from error.
- <u>Solution:</u> true relationship effects can be separated from error by taking multiple measures of the same underlying variable for each dyad.
- When we take multiple measures (either through the use of multiple indicators at the same time or one indicator at multiple points in time), the equation expands to:

 $X_{ijl} = m + a_i + b_j + g_{ij} + e_{ijl}$ 

- $\circ e_{iil} =$  error in measurement *l* for actor *i* and partner *j*
- Estimation of SRM effects:
- Actor effect for actor *i*:

$$a_i = \frac{(n-1)^2}{n(n-2)} + \frac{(n-1)}{n(n-2)} - \frac{(n-1)}{(n-2)}M$$

• Partner effect for person *i* :

$$b_i = \frac{(n-1)^2}{n(n-2)} + \frac{(n-1)}{n(n-2)} - \frac{(n-1)}{(n-2)}M_i$$

- *n* = the group size
- Note: The "." Stands for the row or column of the actor or partner whose effect is being calculated. The "M.." stands for the grand mean (all rows and columns.
- "...the estimate of the actor effect contains the mean for the person as a partner and the estimate of the partner effect contains the mean for the person as an actor. These terms are included because there are missing data in the round-robin data set—the diagonal of the round robin (i.e., the self-data). If such corrections were not made, actor and partner effects would be biased. For instance, if a person has a large actor effect, he or she would mistakenly appear to have a small partner effect, only because he or she does not interact with or rate him- or herself" (Kenny, Kashy, & Cook, 2006, p. 197).

• Relationship effect for persons *i* and *j*:

$$\circ \quad g_{ij} = X_{ij} - a_i - b_j - M..$$

 $\rightarrow$  i.e., the score minus the actor and partner effects minus the grand mean.

 Hypothetical Round-Robin Data Set (taken from Kenny, Kashy, & Cook, 2006, p. 197-198):

			Pa	artne						
		А	r B		С		D		<u>Means</u>	Effects
Actor	Α			8		5		10	7.67	2
	B		7			7		6	6.67	1
	С		8	7				5	6.67	0
	D		4	5		0			3	-3
	Means	6.	33	6.67		4		7	6	
	Effects		1	1		-2		0		

# **Example: Raw Data**

• Actor effect for Person A using the equation presented above:

 $\circ$  7.67(9/8) + 6.33(3/8) - 6.00(3/2) = 2.00 (filled in table above)

• Partner effect for person C using the equation presented above:

 $\circ$  4.00(9/8) + 6.77(3/8) - 6.00(3/2) = -2.00 (filled in table above)

• Relationship effect for A as actor and D as partner using the equation presented

above:

 $\circ \quad 10.00 - 2.00 - 0.00 - 6.00 = 2.00$ 

- SRM Variances
  - o Recall that studies that use SRM are concerned with variances, not effects.

Effects are just needed to calculate variances

# Example used for calculating variance

## Member
		Dyad	<u>1</u>	2	
		AB	-1	-1	
		AC	-1	1	
		AD	2	0	
		BC	2	0	
		BD	-1	1	
		CD	-1	-1	
Actor va	riance is cald	culated as:			
		MS <sub>B</sub>		MS <sub>w</sub>	
li li	-	2(n-2)	+	2 <i>n</i>	-

•  $MS_B$  = Mean squares between:

M	(S <sub>B</sub> =	$2\sum (m_i - M)^2$
		<i>n</i> -1
0	$MS_w$ = Mean squares within:	

MS <sub>w</sub>	=	$\sum d_i^2$
		2 <i>n</i>

• 
$$d = X_{1i} - X_{2i}$$

 $a_i$ 

 $m_i = \underbrace{X_{1i} + X_{2i}}_{2}$ 

- Regarding the example chart provided above, actor variance would be:
  - $\circ$  4.67 1.00 0.33 = 3.33
  - Interpretation: I think this is a messed up example (not explained in the book—Kenny, Kashy, & Cook, 2006) because it would be interpreted as 333% of total variance is attributable to actor variance. According to Kenny (1994), actor variance measure SRA assimilation (i.e., the degree to which individuals rate all others as high or low on a specific trait).
- Partner variance is calculated as:

$$MS_B$$
  $MS_w$ 

- 2(n-2) + 2n
- Regarding the example chart provided above, partner variance would be:
  - $\circ$  2.00 1.00 0.33 = 0.67
  - Interpretation: About 67% of the total variance is attributable to partner variance. According to Kenny (1994), target variance measures *consensus* (i.e., the degree to which all individuals agree that a particular individual is high or low on a specific trait).
- Relationship variance calculated as:
- $(MS_B + MS_w) / 2$
- Regarding the example chart provided above, relationship variance would be:
  - $\circ$  (4.00 + 2.67) / 2 = 3.33

However:

 $b_i$ 

• As noted above, relationship effects are naturally confounded with error. Teasing this out in terms of variances requires multiple measures (either through multiple indicators at one time point, or through one indictor multiple time points).

"To separate error from relationship variance, there must be multiple measures of the construct. Either the same construct is measured in two different ways or the same variable is measured at two points in time. If there is correlation between these multiple measures of the same theoretical construct, the correlation can be treated as relationship variance. More technically, for actor, partner, and relationship effect, variance is partitioned into stable and unstable components.

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Stable refers to variance that correlates across measures of the same construct and unstable refers to variance that does not correlate across measures.

- Separating error from the model:
- "If there are replications, all four terms in the model mean, perceiver, target, and relationship can be partitioned into stable and unstable components" (Kenny, 1994, p. 241).
- SRM with multiple measures:

$$\circ \quad X_{ijk} = m + m_k + a_i + a_{ik} + b_j + b_{jk} + g_{ij} + g_{ijk}$$

- subscript k refers to the measure
- $m_k$  = mean unstable; mean differences between measures
- $a_i$  = perceiver stable; perceiver variance that replicates across measures.
- $a_{ik}$  = perceiver unstable; perceiver variance that is unique to each measure
- $b_j$  = target stable; target variance that replicates across measures
- $b_{jk}$  = target unstable; target variance that is unique to each measure.
- $g_{ij}$  = relationship stable; relationship variance that replicates across measures
- $g_{ijk}$  = relationship unstable; relationship variance that is unique to each measure.
- \*\*\* "If the measures are carefully chosen, there is usually little unstable perceiver and target variance, so the only unstable variance is relationship variance, which is treated as error" (Kenny, 1994, p. 241). \*\*\*
  - Warner, Kashy, and Soto (1979) recommend dropping the unstable mean, perceiver, and target terms.

- \*The assumption that the mean will not be unstable is usually false, but generally people using this type of analysis (including me for my dissertation) are unconcerned with the actual mean score, so we can drop it.
- The new equation is:
  - $X_{ijk} = m + a_i + b_i + g_{ij} + g_{ijk}$
- Kenny (1994) describes two ways to estimate construct variances: (1) using mean squares ANOVA, (2) pooling covariances
- I describe the second method below because it is simpler and can be used for any structure (Kenny only describes method 1 in terms of a half-block design)
- Average of Covariance Matrices:
  - Example taken from Kenny (1994) p. 243:
  - o 3 indicators:

	1	2	3
1	<i>C</i> (1,1)	<i>C</i> (1,2)	<i>C</i> (1,3)
2	<i>C</i> (2,1)	<i>C</i> (2,2)	<i>C</i> (2,3)
3	<i>C</i> (3,1)	<i>C</i> (3,2)	<i>C</i> (3,3)

• Stable variance  $(g_{ij})$  is the average of the off-diagonal elements:

$$\circ \quad \frac{C(1,2) + C(1,3) + C(2,3)}{3}$$

• Unstable variance  $(g_{ijk})$  is the average of the diagonal minus the average of the

off-diagonal elements:

$$\circ \quad \frac{C(1,1) + C(2,2) + C(3,3)}{3} \quad - \quad \frac{C(1,1) + C(2,2) + C(3,3)}{3}$$

• In simpler terms, the correlation between the variance in the multiple indicators is considered the true relationship variance.

SPSS Syntax Used for the Present Analysis:

MIXED

T1\_homophily\_index BY GROUP

/FIXED =

/PRINT = SOLUTION TESTCOV

/RANDOM INTERCEPT | SUBJECT(GROUP) COVTYPE(VC).

/RANDOM INTERCEPT | SUBJECT(ACTOR) COVTYPE(VC)

/RANDOM INTERCEPT | SUBJECT(PARTNER) COVTYPE(VC)

/RANDOM INTERCEPT | SUBJECT(DYAD) COVTYPE(VC).

# Appendix B.

Table 1.

Demographics Broken Out by Group, Taken at Time 3 Only

	Gender	Race	Age Range
Group			
-		4 White/Caucasian; 1 Asian;	33-58 years; 2
1	4 females; 3 males	2 not reported	not reported
		4 White/Caucasian; 1	-
		Black/African American; 1	48-63 years; 2
2	6 females	Middle-Eastern	not reported
	2 females; 1 male;	2 White/Caucasian; 2 not	26-36 years; 1
3	1 not reported	reported	not reported
	-	3 White/Caucasian; 1 adopted	-
	2 females; 1 male;	Asian raised in a white	
4	1 not reported	family; 1 Asian	23-48 years
	-	1 White/Caucasian; 1 Asian;	
5	3 females	1 not reported	27-41 years

#### Table 2

Grown Attendance	hv	Week
Oroup Allendunce	Uy	meen

	Meeting 1	Meeting 2	Meeting 3	Meeting 4	Meeting 5	Meeting 6
Group 1						
	1A	1A	1A	1A	1A	1A
	1B	1B	1B	1B	1B	1B
				ID	10	10
	ID 15	ID 15		IG	ID 15	ID 15
					10	
	10 1H	111	11			11
Group 2						
010 <b>u</b> p 2	2A	2A	2A	2A	2 <b>A</b>	2B
	2B	2B	2B	2B	2B	2C
	2C	2C	2C	2C	2C	2E
	2D	2D	2D	2E	2D	2F
	2E	2E	2E	2G	2E	2H
	2F	2F	2F	2H	2F	2J
	2G	2G	2G	21	2H	
	2H	2H	2H		21	
	21	21	21		2J	
	2J		2 <b>J</b>			
Group 3						
Oloup 5	34	34	3B	3D	3D	30
	3B	3C	3C	3E	3E	3E
	3C	3D	3D	31	31	31
	3D	3E	3E			3H
	3E		3H			
	3F					
	3G					
Group 4			40		4.4	410
	4A 4D	4A 4D	4U 4D	4A 4D	4A 4D	4B 4C
	4B 4C	4B 4C	4D 4G	4D 4E	4B 4C	4C 4D
	40 4D	40 4D	40 41	4г ЛЦ	40 15	4D 15
	4D 4F	4F	71	<del>ч</del> п 41	чг 4G	чг 4G
	TL	TL		11	TU UT	-10

<sup>&</sup>lt;sup>1</sup> Each username was assigned an alpha-numeric code in order to track attendance and participation while maintaining confidentiality of participant identity. Each username was assigned the same alpha-numeric code each week.

Table 2 con	ntinued					
	4F	4F		4J	4I	4I
	4G	4G			4J	
	4H	4H				
	41	41				
	4J					
Group 5						
	5A	5A	5A	5A	5B	5A
		5B		5B	5C	5B
		5C		5C	5D	5C
				5D		5D
Group 6						
-	6A	6B	cancelled	cancelled	cancelled	cancelled
	6B	6E				
	6C	6F				
	6D					
	6E					
	6F					

# Table 3.

# Survey Completion<sup>2</sup>

	Survey 1	Survey 2	Survey 3
Group 1	1A	1A	1A
	1B	1B	1B
	1C	1C	1C
	1D	1D	1D
	1E	11	1E
	1F	1E	1F
	1G	1G	1G
	1H		
Group 2	2A	2A	2B
	2B	2B	2C
	2C	2D	2E
	2D	2E	2F
	2E	2F	2J
	2F	2H	2H
	2H	21	
	21	2J	
	2 <b>J</b>		
Group 3	34	3B	30
Gloup 5	3D	30	3E
	3E	3D	31
	3F	3E	3H
		3H	
Group 4	4A	4A	4B
-	4B	4C	4C
	4C	4D	4D
	4D	4G	4F
	<b>4</b> E	4H	4G
	4F	4I	4I
	4G		
	4H		
	4I		

<sup>&</sup>lt;sup>2</sup> Only participants who answered the survey at all three time points were included in the analysis.

Table 3 con	tinued 4J		
Group 5	5A	5A 5B 5C 5D	5A 5C 5B 5D
Group 6	6A 6B 6C 6D 6E 6F 6G	n/a	n/a

### Table 4.

Measure/Time	Mean	Standard Deviation	α
Homophily			
Time 1	4.51	1.48	.99
Time 2	4.59	1.20	.98
Time 3	4.70	1.20	.94
Competence			
Time 1	4.52	1.10	.91
Time 2	4.65	.90	.95
Time 3	4.65	1.16	. <b>9</b> 7
Trustworthiness			
Time 1	5.28	1.12	.89
Time 2	4.76	.97	.71
Time 3	5.01	.95	.66
Goodwill			
Time 1	4.71	1.30	.95
Time 2	4.08	.80	.97
Time 3	4.06	.80	.92

Means, Standard Deviations, and Alpha Reliabilities of Measurement Scales<sup>3</sup>

<sup>&</sup>lt;sup>3</sup> All variables were measured using 7-point Likert scales

#### Table 5.

Study Variables and Measurement Detail						
Variable	Concentual	Operational				

Variable	Conceptual Definition	Operational Definition	Time(s)	Appendix
Depersonalization	Definition A state in which participants view all of their other group members interchangeabl y, defined fully by their membership in the group	Definition Measured using a round robin design to have each group member answer 11 questions about each other group member. These 11 items were taken from 2 different scales: (1.) 2 items from McCroskey et al.'s (1975) homophily scale (2.) 9 items from McCroskey & Teven's (1999) credibility scale Kenny's (1994) social relations analysis was used to assess the degree of variability within each group member's ratings of all other group members on these qualities. Lower variability within a participant's ratings of all other group members is indicative of greater SRA assimilation.	of Collection After meeting 1; after meeting 3; and after meeting 6	D & E
Confidence in graduate school advice provided by each group member	Confidence in advice provided by group member	Single-item created by the researcher measured on a 7- point scale	After meeting 6	F

#### Table 6.

Summary of Support/Non-Support for Hypotheses 1-34

Hypothesis	Result	
	Visually Anonymous	Visually Identifiable
H1a: At time one, participants in visually anonymous conditions will demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived competence.	Not Supported – opposite	of prediction
H1b At time one, participants in visually anonymous conditions will demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived trustworthiness.	Not Supported – both wer	e significant

<sup>&</sup>lt;sup>4</sup> Not Supported – opposite of predicted direction = the hypothesis was not supported because the judge variance created by the ratings of the group/time period that were predicted to be significant were insignificant, and the judge variance created by ratings of the group/time period that were predicted to be insignificant were significant; Not Supported – neither were significant = a result that is not completely interpretable because judge variance was not significant in either group/ time period; Not Supported – both were significant = a result that is not completely interpretable because judge variance was significant in either group/ time period; Not Supported – both were significant = a result that is not completely interpretable because judge variance was significant in both groups/ time periods.

T	able	6	continued
_		-	

H1c At time one, participants in visually anonymous conditions will demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived goodwill.	Not Supported – neither were significant		
At time one, participants in visually anonymous conditions will demonstrate a greater degree of SRA assimilation (i.e., higher judge variance and lower target variance) in ratings of perceived homophily.	Not supported – neither wer	re significant	
H2a: SRA assimilation for perceived competence will decrease from time 1 to time 2 in both visually anonymous and visually identifiable conditions.	Not Supported – opposite of prediction	Not Supported – both were significant	
H2b: SRA assimilation for perceived trustworthiness will decrease from time 1 to time 2 in both visually anonymous and visually identifiable conditions.	Supported	Not Supported – both were significant	
H2c: SRA assimilation for perceived goodwill will decrease from time 1 to time 2 in both visually anonymous and visually identifiable conditions.	Not Supported – opposite of prediction	Not Supported – neither were significant	

Table 6 continued		
H2d: SRA assimilation for perceived homophily will decrease from time 1 to time 2 in both visually anonymous and visually identifiable conditions.	Not Supported – neither were significant	Not Supported – neither were significant
H3a: SRA assimilation for perceived competence will decrease from time 2 to time 3 in both visually anonymous and visually identifiable conditions.	Supported	Not Supported—both were significant
H3b: SRA assimilation for perceived trustworthiness will decrease from time 2 to time 3 in both visually anonymous and visually identifiable conditions.	Not Supported – neither were significant	Supported
H3c: SRA assimilation for perceived goodwill will decrease from time 2 to time 3 in both visually anonymous and visually identifiable conditions.	Supported	Not Supported – neither were significant
H3d: SRA assimilation for perceived homophily will decrease from time 2 to time 3 in both visually anonymous and visually identifiable conditions.	Not Supported – neither were significant	Not Supported – neither were significant

Table 7.

SRA Relative Partitioning of Variance Components (percentage of variance accounted for by each component relative to the other components) for Perceived Homophily, Competence, Trustworthiness, and Goodwill in Visually Anonymous and Visually Identifiable Group Types

	Factor	Judge	Target	Group	Relationship/
				Number	Error
Time 1					***
Visually					
anonymous					
	Homophily	.03	.03	.00	.93***
	Competence	.25	.13	.00	.62*
	Trustworthiness	.37*	.06	.04	.59***
	Goodwill	.24	.03	.00	.63*
Visually					
Identifiable					
	Homophily	.09	.00	.12	.79***
	Competence	.35*	.10	.00	.54***
	Trustworthiness	.30*	.05	.19	.47***
	Goodwill	.14	.00	.31	.55*

Time 2

Table 7 continued

Visually

anonymous

	Homophily	.19	.13	.001	.67***
	Competence	.36*	.09	.12	.43***
	Trustworthiness	.06	.12	.12	.71***
	Goodwill	.25*	.06	.00	.69***
Visually					
Identifiable					
	Homophily	.11	.11	.10	.67***
	Competence	.38*	.00	.17	.45***
	Trustworthiness	.29*	.00	.38	.33***
	Goodwill	.20	.00	.00	.80***
Time 3					
Visually					
anonymous					
	Homophily	.00	.001	.41	.39***
	Competence	.28	.10	.00	.62***
	Trustworthiness	.21	.18	.09	.53**
	Goodwill	.24	.11	.04	.59*
Visually					
Identifiable					
	Homophily	.17	.00	.15	.68***

#### Table 7 continued

Competence	.34*	.00	.18	.48***
Trustworthiness	.19	.17	.08	.48***
Goodwill	.13	.09	.00	.77*

Table 8.

Mean Ratings and Standard Deviations on Homophily, Competence, Trustworthiness, and Goodwill, Broken Out by Group at Times  $1-3^{5,6}$ 

Time 1			Standard
Group		Mean	Deviation
1.00	Homophily	4.64	1.24
(VA)	Competence	4.37	.88
	Trustworthiness	5.33	1.02
	Goodwill	4.47	.92
2.00	Homphily	4.79	1.51
(VI)	Competence	4.73	1.29
	Trustworthiness	5.59	1.23
	Goodwill	5.33	1.19
3.00	Homophily	4.32	1.71
(VA)	Competence	4.75	1.39
	Trustworthiness	5.27	1.19
	Goodwill	4.30	2.16
4.00	Homophily	4.57	1.26
(VI)	Expertise	4.89	1.01
	Trustworthiness	5.47	1.10
	Goodwill	4.76	1.27
5.00	Homophily	4.70	1.49
(VI)	Competence	4.90	.88
	Trustworthiness	5.00	1.15
	Goodwill	5.40	1.33
6.00	Homophily	3.86	1.59
(VA)	Competence	4.28	1.00
	Trustworthiness	4.79	.96
	Goodwill	4.18	1.21
Time 2			
Group			
1.00	Homophily	5.03	1.35
(VA)	Competence	5.13	.99
	Trustworthiness	5.29	1.09
<u></u>	Goodwill	4.17	.88

 $<sup>^{5}</sup>$  VA = visually anonymous group; VI = visually identifiable group 6

All variables were measured using 7-point Likert scales

Table 8 continued

2.00	Homphily	4.85	1.18
(VI)	Competence	4.89	1.11
	Trustworthiness	5.52	1.19
	Goodwill	4.19	.92
3.00	Homophily	4.12	1.58
(VA)	Competence	4.57	.89
	Trustworthiness	4.45	1.35
	Goodwill	4.28	1.10
4.00	Homophily	4.22	.96
(VI)	Expertise	4.13	.79
	Trustworthiness	4.11	.92
	Goodwill	3.93	.93
5.00	Homophily	4.67	1.61
(VI)	Competence	4.18	.93
	Trustworthiness	5.33	.96
	Goodwill	4.54	.62
Time 3	3		
Group			
1.00	Homophily	5.03	1.35
(VA)	Competence	5.13	.99
	Trustworthiness	5.29	1.09
	Goodwill	4.17	.88
2.00	Homphily	4.85	1.18
(VI)	Competence	4.89	1.11
	Trustworthiness	5.52	1.19
	Goodwill	4.19	.92
3.00	Homophily	4.12	1.58
(VA)	Competence	4.57	.89
	Trustworthiness	4.45	1.35
	Goodwill	4.28	1.10
4.00	Homophily	4.22	.96
(VI)	Expertise	4.13	.79
	Trustworthiness	4.11	.92
	Goodwill	3.93	.93
5.00	Homophily	4.67	1.60
(VI)	Competence	4.18	.93
	Trustworthiness	5.33	.96
	Goodwill	4.54	.62

Appendix C.

Chat Room Interface

#### Admin: logs in on 6/16/2010 12:37 am (et).

<u>Admin</u>: This is what it looked like when participants posted in visually identifiable groups (moderator's photo was in the box)

<u>Admin</u>: *logs in on 6/16/2010 12:47 am (et).* <u>Admin</u>: This is what it looked like when participants posted in visually anonymous groups

# Appendix D.

Homophily (McCroskey et al., 1975)

1.) Is similar to me (1)(2)(3)(4)(5)(6)(7) Is different from me

2.) Is like me (1) (2) (3) (4) (5) (6) (7) Is unlike me

#### Appendix E.

Credibility (McCroskey and Teven, 1999)

*Competence* (1<sup>st</sup> dimension of credibility)

1.) Is expert (1) (2) (3) (4) (5) (6) (7) Is inexpert

2.) Is informed (1) (2) (3) (4) (5) (6) (7) Is uniformed

*Trustworthiness* (2<sup>nd</sup> dimension credibility)

- measured at times 1, 3, and 5; each person rates the group moderator, as well as

each other group member (one by one) on these items.

1.) Is sensitive (1) (2) (3) (4) (5) (6) (7) Is insensitive

2.) Is trustworthy (1) (2) (3) (4) (5) (6) (7) Is untrustworthy

*Goodwill* (3<sup>rd</sup> dimension of credibility)

- measured at times 1, 3, and 5; each person rates the group moderator, as well as each other group member (one by one) on these items.

1.) Has my interest at heart(1) (2) (3) (4) (5) (6) (7) Does not have my interest at heart

2.) Is concerned with me (1)(2)(3)(4)(5)(6)(7) Is not concerned with me

#### Appendix F.

# **Confidence in graduate school advice provided by each group member** (item created by the researcher)

1.) "How confident would you be in graduate school advice provided by (group member username)?"

1 (not at all confident)

2

3

4 (somewhat confident)

5

6

7 (extremely confident)

#### Appendix G

Syntax used to test RQ9:

MIXED

Confidence BY GROUP with t3\_homophily\_index t3\_trustworthiness\_index

t3\_competence\_index t3\_goodwill\_index

/FIXED = t3\_homophily\_index t3\_trustworthiness\_index t3\_competence\_index

t3\_goodwill\_index

/PRINT = SOLUTION TESTCOV

/RANDOM INTERCEPT | SUBJECT (GROUP) COVTYPE(VC)

/RANDOM INTERCEPT | SUBJECT (ACTOR) COVTYPE(VC)

/RANDOM INTERCEPT | SUBJECT (PARTNER) COVTYPE(VC)

/RANDOM INTERCEPT | SUBJECT (DYAD) COVTYPE(VC).

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