



Persuade him by email, but see her in person: Online persuasion revisited

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Abstract

This study replicated and expanded on earlier research on gender differences in the evaluation of computer-mediated persuasive messages. Participants discussed a counter-attitudinal topic with a same-gender confederate. Those participants made to feel a sense of shared identity (high oneness) with the communicator were the most favorable toward the proposal whereas those participants made to feel a distinct identity (low oneness) were the least favorable. However, the results were different for men and women depending on communication modality. Cognitive responses indicated that men engaged in a more rational evaluation of the persuasive message in the email condition, even when the communicator and recipient did not share an identity. Thus, one implication of this research is that email may be an effective route for men to use for interacting with one another if they share no mutual identity.

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1. Introduction

A recent survey by the Pew Internet and American Life Project revealed that most US citizens who spend time online report that the Internet “plays a role in their daily routines and that the rhythm of their everyday lives would be affected if they could no longer go online” (Fellows, 2004), and this report indicated that one of the most popular uses of the Internet is to communicate with others. From the perspective of social scientists, the

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increasing use of the Internet, particularly email for interpersonal communication opens up opportunities for the dissemination of information designed to promote psychological and physical well-being. Persuasion is germane to this because people often need to be persuaded to engage in behaviors and to change attitudes that facilitate well-being. For example, persuasive appeals are often used to encourage smoking cessation (e.g., Invernizzi, Falomir-Pichastor, Munoz-Rojas, & Mugny, 2003) and to encourage condom use to prevent HIV and other sexually transmitted diseases (e.g., Devos-Comby & Salovey, 2002).

Given the ubiquity of email in today's society and the ease with which people transmit information to one another, it may be an inexpensive and far reaching channel to persuade people to engage in attitude and behavior change that will lead to positive well-being outcomes. In order for persuasion researchers to be most effective at convincing others to change attitudes and behavior that may facilitate psychological and physical well-being using this communication modality, it is important to first investigate the factors that moderate the likely success of such an appeal via email, for example: whether email can be a useful mode of communicating such persuasive appeals; and whether there are limitations in terms of characteristics (e.g., gender, age, ethnicity) of the target audience for such appeals as well as the characteristics of the persuasive communicator given the audience.

The purpose of this study is to examine these issues specifically in the context of persuasion by replicating and expanding on prior research that examined gender differences in response to a computer-mediated persuasion attempt (Guadagno & Cialdini, 2002). We would argue that communication via text-based computer-mediated communication (CMC)¹ may enhance or diminish the effectiveness of a persuasive communication depending on the gender of the interactants and the nature of the relationship between them. To explore this question further, we review some of the aspects of computer-mediated communication that may be relevant to this issue as well as prior relevant research on persuasion, and then discuss the study upon which we base predictions for the present research.

1.1. Attributes of computer-mediated communication

Computer-mediated communication facilitates interaction among individuals – be it a co-worker in an adjacent cubicle, sister in another state, or a stranger on the other side of the world. Communication through this primarily text-based medium may differ in myriad crucial ways from other communication media. A person may communicate with others relatively anonymously unless he or she provides relevant personal information (see McKenna & Bargh, 2000 for a broader discussion of the anonymity issue). Furthermore, non-verbal communication between individuals is not feasible in this text-based environment. It is often difficult to get a feel for the flow of a conversation because the tone of voice, body language, or facial expression of interaction partners is not available. Other cues such as status and expertise may also be less salient.

The lack of non-verbal feedback in this text-based modality raises some question as to the impact of CMC on the way social influence processes function. This paucity of non-verbal cues may affect interpersonal interaction in a variety of ways. For example, social

¹ The focus of the present paper is on a specific type of text-based computer-mediated communication: asynchronous email. The predictions we make and the results we report may not generalize to other types of CMC.

influence agents may have greater difficulty gauging the comprehension of their audience and may give too much, not enough, or the wrong information in a computer-mediated interaction. The importance of non-verbal behavior in social interaction has been illustrated by the work of Michael Argyle (1988).

It is also possible that owing to the lack of salient expertise and status cues, social influence between communicators in a CMC exchange may be more balanced than a face-to-face discussion. The removal of cues that convey status (e.g., where people sit, how they are dressed, and other trappings of status) may make it difficult to detect dominance and expertise. Also, the lack of social feedback may render social norms less important, as the individuals communicating via computer may be more self-focused and less focused on their unseen audience (Kiesler, Siegel, & McGuire, 1984).

The differences in the way individuals interact over the Internet described above may impact the effectiveness of many types of interpersonal communication, including persuasion. This leads one to question how the interpersonal influence process works in a computer-mediated environment – an environment where many social cues are less salient or completely absent, where the agent and target of persuasion cannot see each other's face or hear each other's voice.

1.2. Communication modality effects in persuasion

Research on persuasive communication has shown that communication modality influences message processing. Dual process models of persuasion such as the elaboration likelihood model (ELM; Petty & Cacioppo, 1984) and heuristic-systematic model (Chaiken, 1980; Chaiken & Chen, 1999) provide differential predictions for persuasion depending on the social constraint of the communication mode. If a persuasive communication is text-based, it is more likely to be centrally or systematically processed indicating that an influence target will carefully consider the arguments before determining their attitude toward the topic. Conversely, persuasive communications that are presented verbally are more likely to be peripherally or heuristically processed, indicating that an influence target will consider cues such as the number of persuasive arguments, or the attractiveness and likeability of the speaker when determining their attitude toward a topic.

In a study testing the heuristic-systematic model, Chaiken and Eagly (1983) examined how communication mode impacted persuasion. Participants received a persuasive communication through one of three communication modalities: written, videotape, or audiotape. The likeability of the speaker was also manipulated. When the speaker was likeable, participants in both video and audiotape conditions elicited greater attitude change than participants in the written communication condition. When the speaker was not likeable, attitude change was greatest for participants in the written communication modality. These results suggest that in the video and audio-tape conditions the personal cues associated with the communicator were more salient and participants engaged in heuristic processing. Conversely, in the written communication condition, where the personal cues were less salient, participants processed the message systematically. It is also relevant to the present research to acknowledge that the written communication mode muted the fact that the communicator was not likeable.

The results of this study and the general framework of the dual process models of persuasion support the idea that the persuasive impact of different types of messages is moderated by communication modality.

1.3. Does gender interact with communication modality to produce different levels of persuasion?

Two studies conducted by [Guadagno and Cialdini \(2002\)](#) examined this question. In the first study, confederates attempted to persuade same-gender research participants either in a face-to-face discussion or via non-anonymous asynchronous CMC. The results indicated that women who discussed the topic via email reported less agreement with the message than did women in the face-to-face condition, whereas there was no communication mode difference for men.

These results were interpreted in terms of expectations based on social roles – because participants were in same-gender dyads, more gender stereotypical behavior emerged. This assertion is based upon results from research on gender differences in dyadic persuasion indicating that in same gender-dyads, men and women behave in a more gender stereotypical manner than do individuals attempting to persuade someone of the opposite gender ([Carli, 1989](#)). Thus, women were oriented to form bonds with others because the stereotype that women are communal was salient, whereas men were oriented towards the task and establishing independence in this particular context because the stereotype that men are competent was salient.

CMC did not provide an easy opportunity for the establishment of a communal bond so the female participants were not inclined to change their opinion. In support of this interpretation, the authors also reported that participants' ratings of the confederate's likeability were correlated with persuasion only for women in the face-to-face condition. In contrast, men made their decisions based primarily on the arguments; proximity and personality characteristics of the confederate did not have an impact on their opinions.

To replicate and extend these findings, a follow-up study in which participants encountered the confederate prior to the comprehensive exam discussion was conducted. This prior interaction was competitive, cooperative, or independent in nature and always face-to-face. As predicted, once the women participating in this study had an opportunity to interact with the confederate, there was no difference in persuasion by mode of communication. Only women who had no interaction with the confederate – those who were in the independent prior interaction and communicated via email – exhibited a less positive attitude towards the message and reported lower liking the confederate. For men who participated in this study, those who competed with the confederate and then took part in a face-to-face discussion exhibited less opinion change than men in all other conditions.

These results suggested that email may have both positive and negative aspects in terms of its effectiveness as a mode of persuasion – it reduces the salience of a competitor and makes men more open to persuasive appeals from a competitor, but it also reduces women's openness to persuasion and liking from an unfamiliar woman.

It is not surprising that female participants choose to bond rather than compete given that women feel more comfortable cooperating, even in a competitive environment ([Anderson & Morrow, 1995](#)). Women choose to bond with other women, especially in times of stress ([Taylor et al., 2000](#); [Taylor et al., 2002](#)). Earlier research on gender-stereotypical behavior indicates that women will reject imposed roles if they do not agree with them ([Cialdini, Wosinska, Dabul, Whetstone-Dion, & Heszen, 1998](#)). Furthermore, research on gender differences in CMC supports this interpretation. For instance, [Dennis, Kinney, and Hung \(1999\)](#) reported that women who completed a decision-making task in a face-to-face dyad with another woman performed better than did women in a computer-

mediated dyad, whereas communication mode had less of an impact on performance for mixed-gender and male dyads.

One exception to men's tendencies towards competition concerns coalition building, especially among men in kinship groups (Geary & Flinn, 2002). Under certain circumstances, such as preparation for war, men will cooperate with other men in their in-group so that together, they can be triumphant over an outside threat. Thus, men may compete and strive for independence generally, but there are conditions in which men will cooperate with other men, particularly if they are from the same in-group. We will have more to say about this exception later on.

More relevant to the current investigation is the finding that the email interaction reduced the salience of the cues associated with a competitive male, allowing for a greater focus on the persuasive message rather than the fact that the message was coming from a competitor. One implication of these findings is that email may be a way to facilitate communication between men who have a competitive or adversarial relationship with one another.

1.4. Oneness: another way to examine gender differences in persuasion

Besides manipulating prior interaction, are there other ways to further explore the gender differences in persuasion reported by Guadagno and Cialdini (2002)? Contemporary research on altruism has focused on the concept of oneness, a sense of merged or interconnected identity. That research indicates that oneness can lead to greater helping because, in a sense, individuals who help another with whom they feel oneness are helping themselves (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997).

Maner et al. (2002) manipulated oneness in a laboratory setting and tested the relationship between oneness and helping in a study where participants received false feedback that they had either very different (low oneness) or almost identical (high oneness) brain wave patterns with an individual in need of help. There was also a control condition in which participants received no feedback on the brain wave patterns. In the high oneness condition, the experimenter mentioned the high degree of similarity in the brain wave profiles and asked whether the participant could be the target individual's sibling. In the low oneness condition, the experimenter emphasized the dissimilarity between the two brain wave patterns. In the control condition, participants did not receive the oneness manipulation. Participants were next asked to provide help to the target individual. As predicted, participants who had a high sense of oneness with the target volunteered to provide more help than the other conditions, whereas those in the low oneness condition volunteered the least amount of help. Thus, a merged sense of self with another increases the likelihood of helping that other.

According to Cialdini et al. (1997), individuals who experience high oneness with another individual may see themselves as being part of the same in-group and this may lead participants in to be more open to persuasion under certain circumstances. Additionally, we know that people will compete with members of out-groups and cooperate with members of their in-groups because they have a vested interest in doing so. Thus, when someone feels a high degree of self-other overlap with another (high oneness), they may respond cooperatively because the high oneness serves as a cue indicating that the two individuals are members of the same group. Conversely, when there is a low degree of self-other overlap (low oneness), the opposite may occur and individuals may treat the person as an out-group member and respond competitively.

It is possible that oneness may also impact aspects of the persuasive context reported by Guadagno and Cialdini (2002). For instance, the decreased salience of communicator cues in an email interaction may facilitate persuasion from an out-group member – someone an individual may have low oneness with. And given that the prior research reported that this affected men and women differentially, we would expect the same results in the present research. The purpose of the present study is to explore this possibility.

1.5. The present study

The purpose of this study was to follow up on the line of research previously examined by Guadagno and Cialdini (2002). This study tested whether gender and oneness with the communicator interacted to create different levels of persuasion in email as opposed to face-to-face interactions. Utilizing the same methodology, this study built upon the prior research by examining the impact of oneness and also expanded upon the previous work by once again focusing on gender differences in persuasion by increasing or decreasing the participants' perception of the oneness.

There were three oneness conditions: high oneness in which the participants were led to believe that they were extremely similar to the confederate in both their personalities and the way they perceive the world, low oneness in which the participants were led to believe that they were extremely dissimilar to the confederate in the same way, and a control condition in which feedback on oneness was not provided. The control condition also served as a replication cell for the basic initial finding of (1) less agreement with the message for women in the email condition as compared to women in the face-to-face condition with (2) no difference in persuasion by communication mode for men.

1.6. Predictions

Based on the prior research reviewed, we predicted that overall participants who experienced high oneness with the confederate would report the most agreement with the comprehensive exam proposal, whereas individuals in the low oneness condition would report least agreement with the message. We expected that there would be differential responses for men and women depending on the communication modality and the level of oneness with the confederate.

For women, we expected to replicate the basic finding of Guadagno and Cialdini (2002) in the no oneness condition, that women in the email condition would report less agreement with the proposal than would women in the face-to-condition. For the high and low oneness conditions, we wanted to explore whether the oneness manipulation would eliminate the communication modality difference in persuasion, much as the prior interaction did in the prior work, pushing women in the high oneness condition toward a more favorable attitude and women in the low oneness condition toward a less favorable attitude to the proposal.

For men, we expected that, as in the prior research, communication modality would not impact attitude toward the message except when the features of the confederate were likely to evoke a competitive response such as in the low oneness condition.

To further examine the hypothesis that communicating via email may decrease the salience of a competitor or out-group member for men only, we developed a coding scheme for the cognitive responses that examined whether participants have an emotional or

rational reaction to the comprehensive exams and whether they denigrated the communicator. We predicted that men in the email condition would report more rational thoughts and fewer denigrating communicator thoughts due the decreased salience of the communicator and the increased salience of the message in the email condition. Finally, we predicted no difference in overall elaboration by communication mode, so we did not expect any mean differences in overall number of thoughts recorded.

2. Method

2.1. Participants

Research participants were 205 (103 male, 102 female) introductory psychology students who received course credit for their participation.²

2.2. Design

The experimental design was a 2 (communication mode: face-to-face vs. email) \times 2 (gender of the dyad: male vs. female) \times 3 (oneness: high vs. none vs. low) factorial. Participants were randomly assigned to one of the two communication modalities: email asynchronous CMC or face-to-face. As in the prior studies, the persuasive interaction occurred only within same gender dyads (Guadagno & Cialdini, 2002). As in the second study of Guadagno and Cialdini, high personal relevance and strong arguments that favored the institution of comprehensive exams were used (Petty, Harkins, & Williams, 1980).

2.3. Procedure

Participants were told that the purpose of the experiment was to examine differences in personality and the way individuals perceive information. They were also informed they were to take part in a second study which was a two-person interview–discussion and opinion survey conducted on behalf of the university administration. The confederate arrived at the same time and in the same place as each participant and was instructed to appear busy (i.e., bring a book or newspaper) prior to the start of the experiment to avoid any prior interaction with the participant. Once both individuals arrived, the experimenter took the confederate and the participant to separate rooms each with a computer.

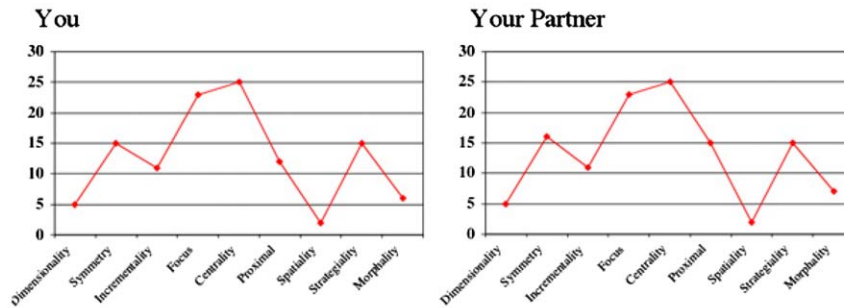
To manipulate oneness, participants were asked to fill out a personality questionnaire (the Big 5; Benet-Martínez & John, 1998) and a bogus shape-perception task where

² Only participants who were native English speakers were run through this study because individuals who were non-native English speakers in the prior work were shown to respond to the topic and experimental conditions differently than the native English speakers. Overall, 25 participants were excluded from the data analysis for the following reasons: 7 participants were suspicious and became aware of the true purpose of the experiment prior to debriefing; 2 participants admitted that someone had told them about the true purpose of the experiment prior to their participation; 4 participants had the same name as the confederate and this similarity interfered with the oneness manipulation; 1 participant was in an altered state of consciousness; 5 participants were dropped due to errors in the experimental procedure; and 6 participants failed the personal relevance manipulation indicating that they were not aware that the comprehensive exam issue applied to them even though they were informed of this verbally by the experimenter and in writing in the stimulus materials. This attrition was equally distributed across the experimental conditions.

participants were asked to rate similar looking shapes on dimensions such as eye-catching and likeability. Following these tasks, participants in the oneness conditions received computer-generated feedback comparing their responses to the responses of the confederate. This feedback consisted of two graphs, one labeled “you” and the other labeled “the other participant”. The feedback graphs contained scores on nine bogus dimensions. In the high oneness condition, the graphs looked nearly identical and text appeared below the graphs indicating that the two individuals were 91% similar in personality and the worldview. Fig. 1 displays the high and low oneness feedback graphs.

The experimenter viewed the results and said the following: “Wow that’s unusual. The chance of two people in the population having profiles as similar as you two is less than 1%. You could be siblings.” In the low oneness condition, the graphs were completely opposite to one another and indicate that the two are only 12% similar in personality and worldview. The experimenter viewed the results and said the following:

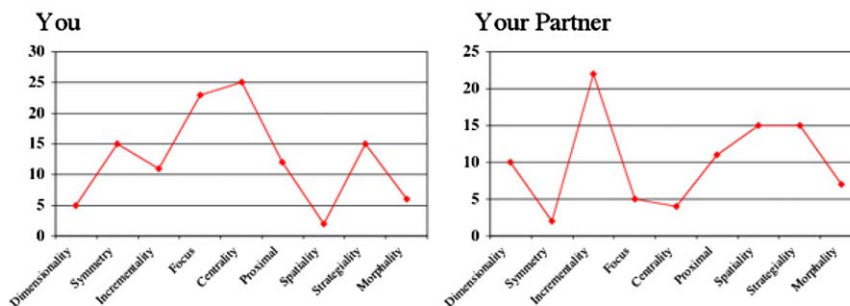
High Oneness



According to these test results, you and your partner are 91% similar in your personality and the way you view the world

Please let the experimenter know that you are done

Low Oneness



According to these test results, you and your partner are 12% similar in your personality and the way you view the world

Please let the experimenter know that you are done

Fig. 1. Feedback graphs for the high and low oneness manipulations.

“Wow that’s unusual. The chance of two people in the population having profiles as dissimilar as you two is less than 1%.” Participants in the control condition received no such feedback.

Next, participants transitioned onto the “second” study, the interview–discussion which was a replication of the persuasive interaction from Guadagno and Cialdini (2002). Participants were “randomly” assigned to be the interviewer in a structured discussion about a proposed change to academic policy: the implementation of comprehensive exams as a new graduation requirement. As the interviewer, participants selected from a list of questions to ask the confederate and the confederate memorized scripted responses to each question. These responses contained strong arguments in favor of the comprehensive exam proposal (e.g., “The quality of undergraduate teaching is better at schools with the exams”). To make this proposal personally relevant, participants were told that if approved, they would have to take the comprehensive exams prior to graduation.

Upon completion of the interview–discussion, each participant filled out the dependent measures, were debriefed, and dismissed. Unlike the previous studies (Guadagno & Cialdini, 2002), participants in both the face-to-face and email conditions filled out all experimental materials on the computer, using a computer-based data collection tool called RiddleMeThis (Loewald & Guadagno, 2003).

2.4. *Dependent variables*

The main measure was participants’ attitude toward the comprehensive exam proposal, measured using a scale ranging from 1 = “Extremely Un_____” to 9 = “Extremely _____” on the following dimensions: workable, valuable, needed, and favorable.

A series of additional measures assessed the participant’s impression of the confederate on a scale ranging from 1 = “Not at all _____” to 9 = “Very _____” on the following dimensions: friendly, approachable, warm, sincere, confident, and interesting.

Next, participants’ cognitive responses to the interview–discussion were measured using a thought-listing exercise. To complete this exercise, participants recorded up to 10 thoughts. Independent judges later classified cognitive responses into the following categories: message-focused thoughts, communicator-focused thoughts, and irrelevant thoughts. Message thoughts were further coded by valence (positive, negative, neutral) and broken down into rational versus emotional thoughts. Communicator thoughts were broken down by valence (complimentary or denigrating).

2.5. *Manipulation checks*

To assess the effectiveness of the oneness manipulation, participants filled out two items previously used by Maner et al. (2002) designed to measure oneness. The first item asked participants to rate the extent to which they would use the term “WE” to describe themselves and their discussion partner on a scale ranging from 1 = “not at all” to 7 = “extremely”. The second item asked participants to select from one of seven different drawings of two circles, labeled “you” and “your partner”, which varied in the amount of overlap from far apart to almost entirely overlapping. Their selections were assigned a value ranging from 1 (farthest apart) to 7 (most overlap).

To assess whether participants realized the exam proposal was personally relevant, participants were asked to check “yes” or “no” in response to the following statement: “The plan will apply to me before I graduate.” Participants who responded “no” to this item were not included in the analysis.

3. Results

3.1. Data analysis strategy³

Unless otherwise specified, all analyses were conducted using a 2 (communication mode: face-to-face vs. email) \times 2 (gender of the dyad: male vs. female) \times 3 (oneness: high vs. none vs. low) analysis of variance on each dependent variable or composite.

3.2. Oneness manipulation check

The two items adopted from Maner et al. (2002) designed to assess oneness were averaged together to form a composite measure of oneness, $\alpha = .80$. These items were intended to assess the degree to which participants felt a sense of merged identity with the confederate. The predicted main effect for oneness on the oneness manipulation check was significant, $F(2, 193) = 25.12, p < .001, \eta^2 = .207$. A series of simple comparisons indicated that participants in the high oneness condition reported significantly more self-other overlap with the confederate ($M = 3.96, SD = 1.48$) as compared to participants in the no oneness condition ($M = 2.85, SD = 1.14$), $t(202) = 5.19, p < .001$, and the low oneness condition ($M = 2.52, SD = 1.10$), $t(202) = 6.62, p < .001$. The difference between the no and low oneness conditions was non-significant, with individuals in the no oneness condition reporting slightly more self-other overlap with the confederate as compared to individuals in the low oneness condition, $t(202) = 1.53, p = .12$.

There was also an unpredicted gender by communication mode interaction on the oneness measure, $F(1, 193) = 8.99, p = .003, \eta^2 = .044$. An examination of the mean differences by condition indicated that women in the face-to-face condition reported experiencing more oneness with the confederate than did women in the email condition ($M = 3.60$ vs. $M = 2.90$), $F(1, 203) = 6.48, p = .012$, but there was no difference in communication mode for men ($M_{\text{email}} = 3.15$ vs. $M_{\text{f2f}} = 2.80$). Thus, the results on the oneness manipulation check indicate that the manipulation was successful in producing different levels of self-other overlap in the expected directions.

3.3. Attitude measure⁴

As in the prior research (Guadagno & Cialdini, 2002), the four items measuring attitude toward the comprehensive exam were averaged to form a composite, $\alpha = .91$. The

³ An additional set of analyses were conducted to assess whether there were mean differences in each dependent measure by condition and confederate but these analyses did not reveal any significant confederate effects. For further details on the confederates and their script, please refer to Guadagno and Cialdini (2002).

⁴ Note that for the 1345 participants overall who filled out this pre-test attitude measure during introductory psychology pre-testing, there was fairly strong negativity towards the comprehensive exam proposal with the mean favorability rating of 2.58, $SD = 2.03$ on a scale ranging from 1 = *not at all favor* to 9 = *extremely favor*.

analysis on the attitude measure composite revealed the predicted main effect for oneness, $F(2, 193) = 4.60$, $p = .01$, $\eta^2 = .045$.⁵ A series of simple comparisons indicated that participants in the high oneness condition reported significantly more agreement with the message ($M = 5.32$, $SD = 1.80$) than did participants in the low oneness condition ($M = 4.36$, $SD = 1.91$), $t(202) = 2.89$, $p < .01$. The mean attitude toward the message reported by participants in the no oneness condition ($M = 4.83$, $SD = 2.00$) fell between the two means, but did not differ significantly from participants in the high or low oneness conditions.

This main effect was qualified by an unpredicted oneness by communication mode interaction indicating that attitude toward the comprehensive exam was higher in the face-to-face than email condition for both high ($M = 5.48$ vs. $M = 5.12$) and no oneness conditions ($M = 5.28$ vs. $M = 4.43$) but the opposite was true for the low oneness condition where attitude towards the message was higher in the email condition than face-to-face condition ($M = 4.70$ vs. $M = 3.94$), $F(2, 193) = 3.19$, $p = .04$, $\eta^2 = .032$. Follow up simple contrasts revealed that the communication mode differences were marginally statistically significant in the no oneness conditions, $F(1, 203) = 3.48$, $p = .06$, but only produced a non-significant trend in the low oneness condition, $F(2, 193) = 1.75$, $p = .18$. For the high oneness condition, the communication mode difference was not significant, $F(1, 203) = 0.88$, ns.

Because we had specific a priori predictions for gender differences in attitude toward the message between the two communication modalities within the oneness conditions, analyses were conducted to test for specific predictions on the attitude measure despite the absence of a significant 3-way interaction between oneness, gender, and communication mode. The analyses comparing the high oneness groups across communication mode within each gender revealed no significant differences, although the cell means trended in the predicted direction with participants in the high oneness/face-to-face condition reporting slightly more agreement with the comprehensive exam proposal than did participants in the high oneness/email condition. See Fig. 2 for a breakdown of means by experimental condition.

However, there were gender differences between communication modalities in the other two levels of oneness. As predicted in the no oneness groups, the difference in attitude toward the message was not significant for men between the two different communication modalities. However, an analysis of the simple effects for women indicated that, as in the two studies reported by Guadagno and Cialdini (2002), there was significantly less positivity towards the message for women who took part in the interaction with the confederate via email as compared to women in the face-to-face condition ($M = 4.26$ vs. $M = 5.58$), $F(1, 203) = 3.91$, $p = .049$.

In the low oneness condition, men reported a significantly less positive attitude toward the message in the face-to-face condition as compared to corresponding email condition, ($M_{\text{f2f}} = 3.96$ vs. $M_{\text{email}} = 5.47$), $F(1, 203) = 4.86$, $p = .029$, whereas there was no communication modality difference for women.

⁵ Attitude towards the comprehensive exam prior to participation in this experiment was available for a subsample of 134 participants. An analysis of covariance also revealed a main effect for oneness, $F(2, 120) = 3.67$, $p = .03$, with a similar pattern of adjusted means as reported above.

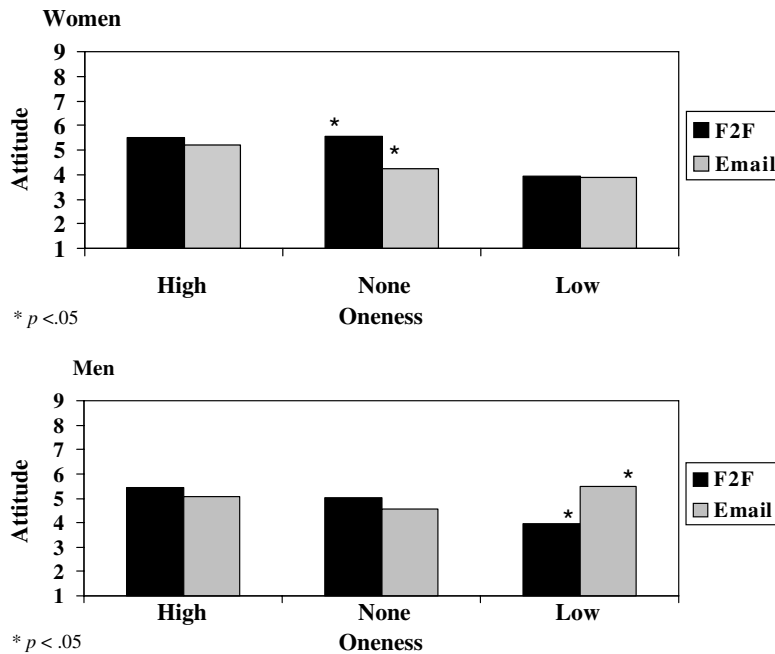


Fig. 2. Attitude toward the comprehensive exam by oneness, communication mode, and gender.

3.4. Confederate trait ratings

Participants recorded their perceptions of the confederate on a variety of personal traits which all loaded on a factor we called congenial. The six items were averaged to form a composite, $\alpha = .89$. An analysis on the measure of confederate congeniality revealed a significant main effect for participant gender, indicating that women rated the confederate as more congenial than did men, ($M = 7.51$ vs. $M = 6.73$), $F(1, 193) = 19.70$, $p < .001$, $\eta^2 = .093$. There was also a marginal main effect for communication mode indicating that participants in the face-to-face condition rated the confederate as marginally more congenial, ($M = 7.28$ vs. $M = 6.95$), $F(1, 193) = 3.30$, $p = .07$, $\eta^2 = .017$.

These main effects were qualified by a significant gender by communication mode interaction, $F(1, 193) = 5.44$, $p = .02$, $\eta^2 = .027$. Post hoc tests revealed that this interaction was due to the difference in congeniality ratings for women in the face-to-face condition as opposed to the email condition. Specifically, women in the face-to-face condition rated their partner significantly more congenial than did women in the email condition, ($M = 7.90$ vs. $M = 7.13$), $F(1, 203) = 8.28$, $p = .004$, but for men the difference between the face-to-face and email conditions was not significant, ($M = 6.67$ vs. $M = 6.78$), $F(1, 203) = .12$, ns. See Fig. 3 for a graphical display of this interaction.

An examination of the correlations between congeniality and attitude toward the message revealed that the correlation between these two variables in either communication modality was not significant, $r_{\text{email}}(105) = .04$, ns and $r_{\text{f2f}}(100) = .03$, ns. Instead, there was a significant correlation between the oneness measure and attitude toward the message which was roughly the same size in each communication mode, $r_{\text{email}}(105) = .32$, $p = .001$

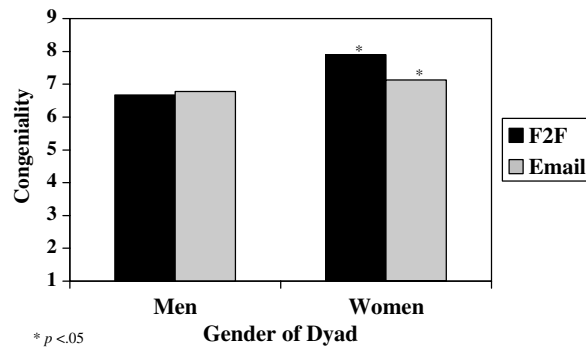


Fig. 3. Communication mode by gender interaction on ratings of confederate congeniality.

and $r_{12}(100) = .35$, $p < .001$. To explore these relationships further, a single step linear regression analysis was conducted with congeniality and oneness predicting attitude toward the comprehensive exam. This analysis revealed that the measure of oneness was a significant predictor of attitude toward the comprehensive exam proposal ($\beta = .51$, $p < .001$), but ratings of confederate congeniality were not significantly predictive ($\beta = -.12$, $p = .22$). Thus, agreement with the proposal was predicted by the amount of self-other overlap felt by participants rather than the degree to which they rated the confederate as likeable. There were no gender differences in these patterns of data.

3.5. Cognitive responses

Two independent judges rated the thoughts recorded by participants after the persuasive interaction. They coded the thoughts into the following categories: total number of thoughts recorded, focus of the thought (communicator, message, or irrelevant), and the valence of the thought (positive, negative, or irrelevant for message-focused thoughts, complimentary or denigrating for communicator-focused thoughts). Additionally, we examined message-focused thoughts to determine if they were rational reactions to the persuasive message (e.g., “The exams will not accurately reflect one’s ability”) or emotional reactions to the persuasive message (e.g., “The exams are scary and unnecessary”). The inter-rater reliabilities were extremely high ranging from $r = .97$ to $r = .46$.⁶

As predicted, there were no significant differences for total number of thoughts indicating that there were no group differences in overall elaboration. In terms of message-focused thoughts, there were no significant differences by condition for the overall number of message thoughts reported by condition. However, when we examined the message thoughts by valence and rational versus emotional reactions, there were some significant effects. For the analysis on positive/rational thoughts, there was a significant 2-way interaction between gender and communication mode, $F(1, 204) = 5.2$, $p = .024$, $\eta^2 = .026$, with men reporting more positive/rational thoughts in the email condition as compared to women ($M = 1.23$ vs. $M = 0.72$), $t(103) = -1.94$, $p = .05$. Women reported slightly more

⁶ Except in categories such as irrelevant thoughts where the inter-rater reliabilities were low due to a restricted range of responses (usually all values were 1 or less).

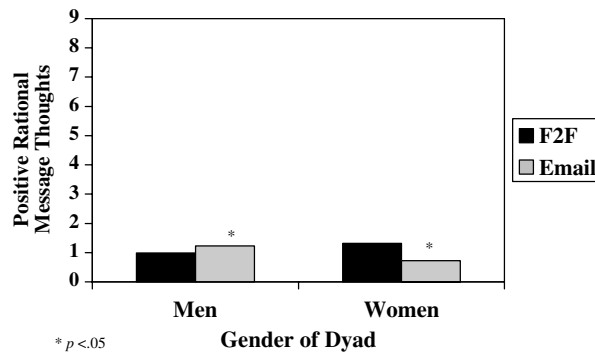


Fig. 4. Communication mode by gender interaction in the number of positive rational message thoughts recorded by participants.

positive/rational thoughts in the face-to-face condition than did men ($M = 1.31$ vs. $M = 0.99$), although this difference was not significant. See Fig. 4 for a graphical display of this interaction.

For negative/emotional thoughts, there was a significant main effect for gender indicating that women recorded more thoughts that contained emotions that were negative toward the comprehensive exam than did men ($M = 0.21$ vs. $M = 0.11$, $F(1, 204) = 3.9$, $p = .05$, $\eta^2 = .02$). There were no significant differences by condition for negative/rational thoughts or positive/emotional thoughts. Overall these results on the message-focused thoughts suggest that attempts at persuasion via email may lead to more rational examination of persuasive messages for men but not for women.

In terms of communicator thoughts, there was a significant gender by communication mode interaction with men reporting significantly more communicator thoughts in the face-to-face condition as compared to email ($M = 1.36$ vs. $M = 0.57$), while women showed the opposite pattern ($M = 0.99$ vs. $M = 1.39$), $F(1, 204) = 7.67$, $p = .006$, $\eta^2 = .038$. This same pattern of results was reflected in the denigrating communicator thoughts: men recorded more denigrating communicator thoughts in face-to-face than email ($M = 0.91$ vs. $M = 0.31$), while women recorded more denigrating thoughts in email as compared to face-to-face, ($M = 0.77$ vs. $M = 0.28$), $F(1, 204) = 10.17$, $p = .002$, $\eta^2 = .05$. Moreover, there was a significant main effect for gender indicating that women reported more complimentary communicator thoughts than did men ($M = 0.68$ vs. $M = 0.37$), $F(1, 204) = 6.59$, $p = .01$, $\eta^2 = .033$. Thus, the results from the thought listing data suggest that men in the email conditions are less prone to negative relational features than participants in the other conditions.

4. Discussion

The results of this study contribute to the understanding of social influence processes in a relatively new communication modality and sheds some light on how gender and the sense of merged self and other impact this process. As in Guadagno and Cialdini (2002), gender and communication mode differences in persuasion were the focus. However, this study extended the basic paradigm to examine the impact of oneness on persuasion and examined the hypothesis that communicating via email may be beneficial for men

attempting to persuade one another, particularly if they have an adversarial relationship. The results indicated that email had the effect of maintaining the separation caused by low oneness, leading to low agreement among women (because of restricted cues for personal connection) but leading to high agreement among men (because of restricted cues for personal confrontation).

Overall the results suggest that email may be a good way for an out-group member to attempt to persuade someone if the individuals are both male, due to the decreased salience of the communicator. Conversely, it suggests that, regardless of communication mode, out-group members may have a difficult time getting a woman to change her mind. Moreover, analyses of cognitive responses indicated that male participants engaged in a more rational evaluation of the persuasive message in the email condition than in the face-to-face condition, even when the communicator was an out-group member.

There were a greater number of positive/rational thoughts recorded after communication via email with the confederate for men than for women suggesting that men took a more rational approach to being persuaded in this condition. In face-to-face exchanges, the opposite was the case; for females this rational approach appeared more in face-to-face exchanges. So, we might interpret these findings in terms of predominantly competitive versus cooperative orientations that men versus women bring to face-to-face encounters. That is, it appears that males allow themselves to be rationally persuaded by strong arguments (which were the type we used) in email exchanges which dilute the competitive aspects of face-to-face contexts for them. Women, on the other hand, who use face-to-face interactions as opportunities for cooperation, are more willing to take a rational approach in such contexts. This interpretation is supported by the findings in terms of the denigrating communicator thoughts: men reported more denigrating communicator thoughts in the face-to-face condition than email, while the opposite was true for women. Thus, men denigrated a competitor when he was salient, while women only denigrated when the opportunity to cooperate was barred. These results are similar to the pattern of findings in the prior study (Guadagno & Cialdini, 2002) which examined competitive and cooperative interactions and suggest that a main effect relationship between openness to persuasion and computer-mediated communication is unlikely.

4.1. Implications of this research

This study also provided an additional replication of the results of Guadagno and Cialdini (2002), which increases confidence in the findings. Taken together this overall line of research suggests that email can be a facilitate open communication for men but may do the opposite for women: not only are women less open to persuasive messages in email when there is no prior relationship or a sense of self-other overlap, women report lower levels of liking for the communicator and less agreement with the message when interacting via email. This suggests that women are less likely to form connections with other women when the communication modality is email and, as the use of email is a common and popular mode of communication mode, may inhibit the formation of liking between women.

4.2. Limitations of this research and future directions of study

One clear limitation of this study is that it only examined same-gender dyads. It is unlikely that these findings would generalize to mixed-gender dyads because men and women

behave in a less sex stereotyped manner in mixed-gender dyads as compared to same-sex dyads (Carli, 1989). Future research should examine how the persuasion process works with mixed-sex dyads. It may be that most communication mode differences in persuasion will be reduced or eliminated because men will be less competitive and concerned with maintaining independence and women will be less focused on forming a bond.

This study examined persuasion in a context where the CMC was text-based, asynchronous, with a low response latency. In this study, participants and confederates emailed each other in real time. It would be interesting to examine the impact of timing but extending the length of time the persuasive interaction took place to see if participants processed the message differently based on latency as one study reported (Moon, 1999). Future research should examine the latency issue further.

Owing to the exclusion criteria for non-native English speakers in both this study and Guadagno and Cialdini (2002), the results of this research may not generalize to other cultures. The topic of comprehensive exams may be more objectionable to US undergraduates than it would be to college students in cultures with different norms about standardized testing. It is also likely that individuals from collectivistic cultures would perceive the oneness manipulation differently due to their greater group orientation. Thus, the results of this study may not generalize outside this culture. Furthermore, this study examined persuasion on a topic that was personally relevant to our specific sample of college students. Additional research should attempt to examine whether these results generalize to samples other than college students and to other topics, particularly those that encourage attitudes and behaviors that promote well-being. Future research should explore these generalizability issues further.

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References

- Anderson, C. A., & Morrow, M. (1995). Competitive aggression without interaction: Effects of competitive versus cooperative instructions on aggressive behavior in video games. *Personality and Social Psychology Bulletin*, *21*, 1020–1030.
- Argyle, M. (1988). *Bodily communication* (2nd ed.). London: Methuen.
- Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, *75*, 729–750.
- Carli, L. L. (1989). Gender differences in interaction style and influence. *Journal of Personality and Social Psychology*, *56*, 565–576.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*, 752–766.
- Chaiken, S., & Chen, S. (1999). The heuristic-systematic model in its broader context. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology*. New York: Guilford.
- Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology*, *45*, 241–265.

- Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: when one into one equals oneness. *Journal of Personality and Social Psychology*, *73*, 481–494.
- Cialdini, R. B., Wosinska, W., Dabul, A. J., Whetstone-Dion, R., & Heszen, I. (1998). When role salience leads to role rejection: modest self-presentation among women and men in two cultures. *Personality and Social Psychology Bulletin*, *24*, 473–481.
- Dennis, A. R., Kinney, S. T., & Hung, Y. C. (1999). Gender differences in the effects of media richness. *Small Group Research*, *30*, 405–437.
- Devos-Comby, L., & Salovey, P. (2002). Applying persuasion strategies to alter HIV-relevant thoughts and behavior. *Review of General Psychology*, *6*(3), 287–304.
- Fellows, D. (2004). The Internet and daily life: many Americans use the Internet in everyday activities, but traditional offline habits still dominate. Retrieved Monday September 27th, 2004. Available from <http://www.pewinternet.org/PPF/r/131/report_display.asp>.
- Geary, D. C., & Flinn, M. V. (2002). Sex differences in behavioral and hormonal responses to social threat: commentary on Taylor et al. (2002). *Psychological Review*, *109*, 745–750.
- Guadagno, R. E., & Cialdini, R. B. (2002). Online persuasion: an examination of gender differences in computer-mediated interpersonal influence. *Group Dynamics: Theory Research and Practice*, *6*, 38–51.
- Invernizzi, F., Falomir-Pichastor, J. M., Munoz-Rojas, D., & Mugny, G. (2003). Social influence in personally relevant contexts: the respect attributed to the source as a factor increasing smokers' intention to quit smoking. *Journal of Applied Social Psychology*, *33*(9), 1818–1836.
- Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, *39*, 1123–1134.
- Loewald, T. A., & Guadagno, R. E. (2003). *RiddleMeThis*. Santa Barbara, CA: Loewald New Media [Computer software available online at <www.Loewald.com/RiddleMeThis>].
- Maner, J. K., Luce, C. L., Neuberg, S. L., Cialdini, R. B., Brown, S., & Sagarin, B. J. (2002). The effects of perspective taking on motivations for helping: still no evidence for altruism. *Personality and Social Psychology Bulletin*, *28*, 1601–1610.
- McKenna, K. Y. A., & Bargh, J. A. (2000). Plan 9 from cyberspace: the implications of the Internet for personality and social psychology. *Personality and Social Psychology Review*, *4*, 57–75.
- Moon, Y. (1999). The effects of physical distance and response latency on persuasion in computer-mediated communication and human–computer communication. *Journal of Experimental Psychology: Applied*, *5*, 379–392.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: central and peripheral approaches to persuasion. *Journal of Personality and Social Psychology*, *46*, 69–81.
- Petty, R. E., Harkins, S. G., & Williams, K. D. (1980). The effects of group diffusion of cognitive effort on attitudes: an information-processing view. *Journal of Personality and Social Psychology*, *38*, 81–92.
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-flight. *Psychological Review*, *107*, 411–429.
- Taylor, S. E., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., Updegraff, J. A., & Klein, L. C. (2002). Sex differences in biobehavioral responses to threat: reply to Geary and Flinn (2002). *Psychological Review*, *109*, 751–753.