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Self-control as a Mediator or a Moderator in a Deindividuation Context

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ABSTRACT

The current study examined whether deindividuating cues (i.e., anonymity) influence individuals to exhibit group polarization, and to test whether self-control mediates and/or moderates this process. In the experiment, 56 participants were randomly assigned to an individuated (shared personal information) or a deindividuated condition (did not share personal information). Participants then shared opinions on hypothetical scenarios in an electronic chat-room with three supposed-participants who agreed with the actual participant's opinion. Polarization of the participants' responses over time was calculated. Contrary to the study hypotheses, participants in the individuation condition exhibited more polarization than those in the deindividuation condition. Perception of self-control neither mediated nor moderated this process. Reasons for such polarization patterns are discussed, along with limitations of this study and future directions.

Self-control as a Mediator or a Moderator in a Deindividuation Context

A sense of personal control is fundamental to our existence. However, when immersed in a group, individuals tend to adhere to the group's behaviors or norms, be they deviant/destructive behaviors or prosocial/helping behaviors. This raises the question - do individuals perceive a higher or lower sense of control in the midst of group behaviors? Some have suggested that one loses a sense of self and therefore control (e.g., Festinger, Pepitone, & Newcomb, 1952) while others have argued that heightened self-control might be involved in such group contexts (e.g., Spears & Lea, 1992). Are these behaviors enacted with a higher sense of control or a lower sense of control? In this study, deindividuation and polarization theories are examined to understand the role of perceived control in group contexts.

Classical deindividuation theories

Deindividuation has been classically studied as a psychological state where individuals engage in antinormative and/or uninhibited behaviors, such as those exhibited by lynch mobs and hooligans, due to anonymity and loss of identity. Festinger et al. (1952) first coined the term "deindividuation" as a state when individuals are not "seen or paid attention to as individuals"(p.382) and therefore are likely to experience a "reduction of inner restraints against doing various things" (p.382). This would explain why a group of boys walking down the street might behave wilder and with less restraint than they would if they were alone. In their formative deindividuation study, Festinger et al. (1952) found that individuals who could not be identified were more likely to express negative attitudes toward their parents in a discussion about a fictitious study, which claimed that the majority of students possessed a strong hatred of one or both parents.

Later deindividuation theories attempted to identify the psychological factors that accompany those unrestrained behaviors. Singer, Brusch, and Lublin (1965) defined deindividuation as a "subjective state in which people lose their self consciousness" (p.356). Zimbardo (1969) extended the theory proposing that situational predictors of deindividuating behaviors (such as anonymity and group size) lead to a loss of self-observation, self-evaluation, and a lower concern for social evaluation, which ultimately result in deviant/destructive behaviors. Diener (1979, 1980) proposed that lowered self-awareness leads an individual to arrive at a deindivudated state, as they are "blocked from awareness of themselves as individuals and from monitoring their own behaviors" (Diener, 1980, p.210). To demonstrate this, Diener (1979) induced one group of participants to become more self-aware by engaging in solitary tasks such as writing an essay about themselves and wearing unique attire amongst others who wore coveralls. Another group of participants was induced to become less self-aware by engaging in tasks that led their attention outward such as playing puzzles and games and wearing coveralls amongst others who also wore coveralls. This study showed that those who were induced to become less self-aware were more likely to suggest that the group engage in disinhibited activities (e.g, playing in mud, finger painting with your nose), than those who were induced to become more self-aware. Because Diener (1979, 1980) did not account for the sub-types of self-awareness that differentially influence deindividuated behaviors, Prentice-Dunn and Rogers (1982) proposed the differential self-awareness theory of deindividuation, as a refined version of Diener's theory. This theory assumes that self-awareness is composed of private self-awareness and public self-awareness, and that public self-awareness involves "concerns about one's appearance and the impression made in social situations" while private self-awareness involves a "focus on personal, more covert aspects of oneself such as perceptions, thoughts, and

feelings" (p.504). In this model, lower accountability cues, such as anonymity and diffusion of responsibility, would reduce public self-awareness, while higher external attentional cues, such as group immersion and physiological arousal, would reduce private self-awareness, and that these cues would lead an individual to engage in disinhibited behaviors. Furthermore, they argued that although both accountability and attentional cues may lead to disinhibited behaviors, only attentional cues that led to reduced private self-awareness would mediate deindividuated and disinhibited behaviors. In fact, Prentice-Dunn and Rogers (1982) found that participants who were induced with external attentional cues (via verbal instructions to focus attention outward in a loud room) exhibited more disinhibited behaviors and reported lower private self-awareness levels than those who were not induced with such cues.

Overall, many classical deindividuation theories have interpreted deindividuation as a state where an individual loses a sense of behavioral control and awareness, which consequently leads to disinhibited antinormative behaviors. However, a meta-analysis conducted by Postmes and Spears (1998) found that only anonymity to out-group and public self-awareness lead to deindividuation effects, and that deindividuation effects are not limited to antinormative behaviors but included normative behaviors as well. This finding partially undermines classical models that suggest that anonymity to both in- and out-group leads to deindividuated behaviors, and that deindividuated behaviors are limited to antinormative behaviors. It also fails to support the differential self-awareness theory of deindividuation which suggests that private self-awareness mediates deindividuated behaviors. This led Postmes and Spears (1998) to support the social identity model of deindividuation effects (SIDE model) (Spears & Lea, 1992, 1994; Reicher, Spears, & Postmes, 1995), which might better explain the mechanism of deindividuation effects.

Social identity model of deindividuation effects (SIDE model)

The SIDE model (Spears & Lea, 1992, 1994; Reicher, Spears, & Postmes, 1995) is different from prior classical theories in that it reflects how individuals become sensitive to the norms that are salient. This model conceives an individual as consisting of at least two identities, where one is the personal identity and another is the group identity, and that different identities become salient based on the context. For an individual to express one's identity, one needs to first cognitively choose an identity, which is likely to be the most salient one in the given situation, and then strategically choose the appropriate mode of behaviors to express that chosen identity (Spears and Lea, 1994). Deindividuating factors, such as anonymity and group immersion, allow the group identity to become more salient than the personal identity, and thereby, induce an individual to become more sensitive to the group norm and thus behave accordingly. Specifically, anonymity reduces interpersonal differences among individuals while heightening salience on social factors, allowing one to switch the focus from a personal identity to the group identity. Also, group immersion increases the salience of group identity by emphasizing that individuals are treated as a group member and by shifting attention to the group from the individual (Reicher, 1984). However, when social factors are not salient because group boundaries are indistinct, anonymity might instead induce an individual to focus on a personal identity, as this induces one to experience isolation from the group (Reicher et al., 1995).

Postmes and Spears (1998) found in their meta-analysis that there was a strong relationship between deindviduated behaviors and group norms, such that deindividuating factors influenced individuals to conform to group norms and thereby further induce deindividuated behaviors. In fact, they also found the SIDE model to explain the normative conformity behaviors exhibited among deindividuated participants. For example, in a study by Johnson and

Downing (1979), participants in one condition were dressed in nurse uniforms, and in another condition dressed in Ku Klux Klan uniforms. Participants were to administer shocks to purported students in the next room whenever they made errors. The study revealed that participants who were dressed in nurse uniforms without nametags shocked less than those who wore nametags, and those who were dressed in the Ku Klux Klan uniforms without nametags shocked more than those who wore nametags. This is because uniforms without nametags allowed participants to become anonymous while perceiving the group's norm as more salient, thus influencing them to behave according to those norms.

Overall, the SIDE model predicts that deindividuation factors, such as anonymity and group immersion, lead to deindividuation behaviors, which are behaviors that essentially reflect conforming to the group or situational norm. Conforming to these norms can be exhibited in various ways, and one of them is group polarization.

Group Polarization

Group polarization is a phenomenon when an individual tends to become more extreme in his/her position on a certain issue following a group discussion (Isenberg, 1986). For example, when a subject who is moderately risk-seeking engage in a group discussion with slightly risk-seeking group members on choosing among options varied by riskiness, the subejct will likely end up choosing a very risky option after the discussion. Conversely, if the members of the group were moderately risk averse, the subjects will likely end up choosing a very cautious option after the discussion.

To explain why group polarization occurs, Sanders and Baron (1977) suggested that the social comparison theory (Festinger, 1954) explains the polarization phenomenon. Social comparison theory states that when the situation is ambiguous, people compare themselves to

similar others, and that they continuously adjust their opinions (or thoughts, feelings, and/or behaviors) in the direction valued by others. This may be due to a normative influence, where individuals are motivated to appear in a socially desirable manner, or due to an informational influence, where individuals are motivated to be correct (Isenberg, 1986).

In a deindividuation context, the social comparison theory fits well with the SIDE model, in that both hinge on the normative influence of the group/situation to conform. To understand such social influence in a group context, where individuality is overshadowed by the group's identity, studies have examined deinvidiaution effects on group polarization.

SIDE model and group polarization

In a formative study of the SIDE model, Riecher (1984) examined the role of self-categorization by measuring attitude polarizations. In this study, a group of science students and a group of social science students were recruited, and the study had manipulations on group immersion (group versus individual) and anonymity (anonymous versus identifiable). In the group condition, science students and social science students sat at separate tables facing each other, and were informed that they were being tested as members of their respective groups. In the individual condition, all students sat mixed, facing the front of the lab, and were informed that they were being tested as individuals. In the anonymous condition, students wore baggy overalls and masks, and in the identifiable condition, students were dressed normally. For instance, in the group – anonymous condition, one group wore red masks and the other group wore white masks, and both groups were separately seated facing each other. During the study, students watched a videotape of arguments concerning vivisection, and scientists consistently argued for vivisection, while social scientists argued against it. Then the authors examined the changes in attitude towards vivisection since the start of the experiment. When students were

immersed in a group (i.e., group condition), they showed more extreme opinions on vivisection in the direction of their corresponding group than when they were isolated (i.e., individual condition). Anonymity had a different impact based on group immersion, such that for those in the group condition, anonymity further polarized their attitude, but for those in the individual condition, anonymity reduced the extent of their attitude polarization. This finding supports the SIDE model, such that when individuals are immersed in a group with anonymity, their group identity becomes more salient, and they are influenced to conform to the group's norm by favoring the norm even more.

Subsequent to this study, much of the work examining deindividuation effects of group polarization were conducted in a computer-mediated communication (CMC) context.

SIDE model, group polarization, and computer-mediated communication (CMC)

Many of the studies examining deindividuation and group polarization employ computer-mediated communication (CMC) contexts, possibly because of the deindividuating features of CMC. Communications in electronic chatrooms, electronic mails, or social media are examples of CMC. In such a context, compared to face-to-face communications, individuating cues are relatively lacking and thus interpersonal differences become less visible. For that reason, individuals can become truly anonymous in a CMC context as opposed to deindividuated face-to-face interactions, as people can potentially become anonymous to both their in-groups and out-groups. This, in turn, may induce people to become more sensitive to group membership cues, if the cues are salient, such as when your electronic mailing address includes your school name. Conversely, anonymity may induce people to become less sensitive to group membership cues, if the cues are not salient, such as when you are chatting online with strangers without sharing personal information (Spears & Lea, 1992; Spears & Lea, 1994).

Lea and Spears (1991) conducted a study similar to Reicher (1984) to examine attitude polarization within a CMC context within a single discussion group. Here, they manipulated group immersion by referring to participants through individual code numbers (individual condition) or through group code numbers (group condition). They also manipulated anonymity by either having subjects sit isolated in different rooms (anonymous condition) or seated in the same room with all other subjects (identifiable condition). Subjects discussed four controversial subjects (e.g., nuclear power, privatization of industry) amongst themselves via computers, producing similar results as those from the study by Riecher (1984). Specifically, participants in the group condition exhibited even more polarization when deindividuated (anonymous) than when individuated (identifiable), while participants in the individual condition showed more polarization when individuated than when deindividuated.

Taylor and MacDonald (2002) conducted a similar experiment among geographically distant participants who took part in an e-mail discussion during a two week period. The study was designed to vary by personal identifiability (low vs. high) and group immersion (low vs. high). Those in the high personal identifiability condition had their biographical information shared among other discussion members, while those in the low personal identifiabilty condition did not. Participants in the high group immersion condition were instructed that the discussion was "to examine communications between group members ... and to see if there are any differences between various groups in the way that they communicate", while those in the low group immersion condition were told that the discussion was "to observe communications between individuals… and to examine personal styles in the way individuals communicate." Participants discussed the topic "issues concerning the definition of rape" via e-mail and were allowed to exchange as many e-mails during the two week period. Attitudes to rape were

measured at the beginning of the discussion and at the end; the study showed no significant differences in attitude change among either deindividuated participants (low identifiability condition) or individuated participants (high identifiability condition). This is contrary to Lea and Spear's (1991) results and may be due to a longer time frame of the study, as it may be that normative influence in a CMC is most influential in the early stages of discussion. In fact, Lea and Spears (1991) found that conciseness in messages was associated with group polarization, and so it is possible that polarization occurs the most when fewer and shorter messages are exchanged (i.e., at the early stages of discussion). Another reason may be the absence of an explicit norm at the start of the discussion. Specifically, in this experiment, explicit norms were not established at the start of the discussion, and thus there may have been disagreements among group members at first. This may have dampened or confounded the effect of polarization. However, an interesting finding from this study is that individuated participants reported experiencing more group cohesion than deindividuated participants. This conflicts with the SIDE model, which implies that deindividuating factors, such as anonymity, would induce an individual to focus on the group identity rather than the individual identity.

In a slightly different light, Sia, Tan, and Wei (2002) compared the extent of group polarization in a CMC setting, by varying the presence of social visual cues and anonymity. In this study, conditions varied by experimental settings (face-to-face CMC vs. dispersed CMC) and identifiability (identified vs. anonymous). Participants in the face-to-face CMC condition sat around a table with computer monitors placed in front of them, and were limited to using only visual and textual cues during the discussion (i.e., communicate via computers and/or hand gestures and facial expressions). Also, their discussion opinions were displayed on a big public screen. Participants in the dispersed CMC condition could neither see nor hear other members

because they were separated by partitions, and their discussion opinions were displayed on their private computers. Here, their discussion was conducted only through electronic textual cues (i.e., via computer). In the identified condition, participants had their identities tagged to their positions online, while those in the anonymous condition did not have their identities linked. The task for the participants was to assume a role as a business executive and to select a scheme to increase the market share of their company. The group discussion underwent a series of rounds, during which subjects simultaneously generated their positions with arguments, and then sequentially presented their views to others. The discussion ended when subjects reached a consensus or when a maximum of four rounds were completed. In this study, in the identified condition, the dispersed CMC condition yielded significantly greater polarization than the face-to-face CMC condition. In addition, in the face-to-face condition, the anonymous participants showed larger polarization than identified participants. However, in the dispersed CMC condition, although identified participants showed larger polarization than anonymous participants, the difference was not statistically significant (see Figure 1).

King, Hartzel, Schilhavy, Melone, and McGuire (2010) conducted a study to examine the differences in a CMC and face-to-face communication on group polarization. In this study, participants were assigned roles as various stakeholders in a pharmaceutical company (e.g., founder and chairman, employee representative, mayor's representative of the public). Each discussion group was composed of both majority stakeholders and minority stakeholders, where the board members were cast into majority roles, and the public representative was cast as a minority role. The group's task was to discuss how to deal with product liability exposure related to one of its most profitable drugs, and decide among options varying in the level of social responsibility. Participants were randomly assigned to either a CMC group or a face-to-face

group, and the study found that participant's role-based preferences in the CMC condition were more polarized than those in the face-to-face condition. In this study, polarization was measured as the extent to which the role-based opinion gravitated towards the group's consensus, which was the compromised position. For example, if the participant's role was as a board member, and he/she initially opined for a less socially responsible option (e.g., continue to effectively market the drug and take legal, political, and other action to prevent authorities from banning the drug), there would be group polarization when his/her opinion changed towards a more socially responsible option (e.g., stop all advertising and promotion of the drug), since it was conforming towards the group's consensus. However, this measure may be suspect, as there was clear disagreement in the early discussion phase among the majority and minority members, rendering the boundary between in-group and out-group more salient, and thus confounding the perception of norms. For example, some majority members who perceived the board members as their in-group would have perceived the less socially responsible opinion as the norm, while some may have considered the entire group as the in-group and perceived the more socially responsible option as the norm. An interesting finding from this study is that the authors also measured the participants' actual preferences independent of their roles at the start and end of the experiment. With this more private measure of attitude change, it was shown that individuals in the face-to-face condition were more likely to convert to the group's conclusion than those in the CMC condition. In other words, they were more likely to privately shift from their original position to conform to the group's conclusion than those in the CMC condition. Hence, when the in-group boundary is not clear, such as when there are disagreements among group members, a CMC context seems to lead individuals to publicly shift their opinions more than when they are in a

face-to-face communication context, and a face-to-face context leads them to privately shift opinions more than when they are in a CMC context.

The studies described above and other variations conducted on CMC and group polarization (Lee and Nass, 2002; Lee, 2004; Lee 2007) generally show that depersonalized (i.e., lower identifiability) discussion via CMC makes the group identity more salient, and thus induces more adherence to the group's norm (i.e., more polarization). However, these studies have also shown that if there were cues that would render individuality salient in CMC (e.g., use unique avatars to reflect one's character), people would adhere less to the group's norm (i.e. less polarization). These findings suggest that individuals in a deindividuation context may not lose sense of control, but rather become more aware and responsive to the perceived situational norms. However, there have not been any studies that empirically and explicitly tested the role of perceived control in this context.

Perceived control as a mediator/moderator of deindividuation effects

In order to explain the processes of deindividuation effects, several theories put forth various psychological mediators or moderators as influencing factors. Mediators are those that explain how or why such effects occur in a process, whereas moderators specify when certain effects would occur (Baron & Kenny, 1986). Classical deindividuation studies have attempted to see if private self-awareness was involved in deindividuation effects. For instance, Froming, Walker, and Lopyan (1982) found that private self-awareness moderated deindiviudated behaviors, such that those low in private self-awareness engaged in more aggressive behaviors than those high in private self-awareness. Prentice-Dunn and Rogers (1982) attempted to see if attentional cues mediated deindividuation effects, such that internal attentional cues decrease deindividuated behaviors. In order to present internal attentional cues, participants were

instructed to sit alone in an isolated room and were encouraged to attend inwardly. These participants were compared against those who were exposed to external attentional cues, who sat in a dimly lit room with loud rock music playing in the background while playing exciting video games and interacting with others (i.e., with external attentional cues). The study showed that those induced with internal attentional cues tended to exhibit lower levels of aggression. However, these findings were mixed with other elements, rendering it difficult to tease out which factors mediated or moderated deindividuation. For instance, Froming et al. (1982) found that those low in self-awareness tended to engage in aggressive behaviors only if they perceived that others favored such behaviors. Also, from the study by Prentice-Dunn and Rogers (1982), although external attentional cues have shown to induce deindividuated behaviors, elements such as accountability and public self-awareness were involved in producing those behaviors.

In examining self-awareness, Matheson and Zanna (1989, 1990) found that a CMC context increased private self-awareness because individuals were in a physically isolated environment. Sassenberg, Boos and Rabung (2005) found that private self-awareness moderated the effect of interpersonal influence in different mediums, such that only individuals high in private self-awareness showed strong interpersonal influence in face-to-face communication than in CMC. On the other hand, Lee (2007) found that there were no significant differences in regard to private self-awareness among individuated and deindividuated participants. Overall, among deindividuation studies, there are no reliable findings that private self-awareness played a role in deindividuation effects. However, a meta-analysis by Postmes and Spears (1998) suggests that there is sufficient evidence that public self-awareness is involved in deindividuation effects.

Recently, Lee (2007) found that group identification was involved in deindividuation effects. In this study, participants were placed in either an individuated or deindividuated

condition, and were provided with hypothetical scenarios, which posed a choice between actions of high risk and low risk. Participants presented their opinions to three other supposed participants online, and then read those other supposed-participants' opinions, which were preprogrammed to agree with the participant's opinion. After the discussion, participants indicated their final opinions on those hypothetical scenarios, and completed a survey on how publicly self-aware they were during the discussion, and how much they felt the other supposed-participants were like the participant him/herself. This study showed that individuals in a deindividuated condition were more likely to polarize from their initial opinion, and that public self-awareness and group identification mediated these behaviors. In fact, this study suggested that rather than deindividuation *per se*, public self-awareness and group identification were better predictors of attitude polarization (i.e., deindividuation effects). These results further support the SIDE model, in that deindividuation is due to the salience of the group one perceives and identifies with. This is because when individuals are immersed in a group and identify with the group, it seems that they become more publicly self-aware and thus more sensitive to the evaluation by others, and even seek social approval from those with whom they are affiliated. This implies that contrary to what classical deindividuation theories hypothesize, deindividuation may not involve a reduced sense of control, but rather a heightened or at least a sustained one. So far, existing deindividuation theories merely suggest the involvement of sense of control, but do not explicitly examine whether this mediates or moderates deindividuation effects. Moreover, with conflicting results on how private self-awareness is involved, it becomes even more difficult to predict whether sense of control is reduced or heightened in deindividuation contexts. The current study addressed this issue.

The current study

Given the unclear role of self-control and awareness in a deindividuated behavior, the study aims to understand how self-control might mediate or moderate deindividuated effects such as polarization in a deindividuation context, along with how and whether public, private, and situational self-awareness is involved. In order to understand the psychological factors involved in deindividuation effects, specifically attitude polarization, the study examined how individuals with and without individuating information differed in self-control, awareness, and the extent of attitude polarization. Hence, the study hypothesized that:

1 - Those exposed to deindividuating cues (i.e., remain anonymous and not share personal information) would show a larger change towards the group norm (i.e., attitude polarization) compared to those not exposed to such cues.

2 - The relationship between deindividuating cues and deindividuating effects (i.e., attitude polarizaiton) would be mediated (i.e. explained) by a decrease in self-control.

3 - The relationship between deindividuating cues and deindividuating effects (e.g., attitude polarization) would be moderated by (i.e. changed by) differing levels of self-control.

Method

Subjects

Fifty six undergraduate students (23 men, 33 women) fulfilling a psychology course requirement at City College, within the ages of 18 to 40 years (M = 20.39; SD = 2.88; actual range: 18-34), who were healthy and fluent in English participated in this study. There was roughly equal representation of freshman, sophomore, and junior years, and the majority used the computer more than five times a day. Demographic details can be found in Table 1.

Procedure

Participants were recruited from the City College Subject Pool, where they were informed that this experiment would be on computer-based communication and forming opinions. Participants gave informed consent before starting the experiment, which was carried out after approval by the local ethics committee (CUNY HRPP, protocol# 556119-3).

Prior to the study, participants who signed up via Subject Pool each received an e-mail that provided a website address of the electronic chat-room (www.chatango.com), where the study would take place. On the day and time of the experiment, participants then logged onto the chat-room site created and designed for this study, and virtually met the experimenter and three other participants. However, there were actually no 'other' participants, and the experimenter played the role of those three 'other' participants simultaneously online. Actual participants were randomly assigned to either a deindividuation or individuation condition. Those who were assigned to the deindividuation condition were instructed to use an anonymous chat-name (such as 'anon4530'), and those who were assigned to the individuation condition were instructed to use non-identifiable but unique chat-names (such as 'RHfan'). Hence, those in the deindividuation condition were manipulated by not being exposed to individuating cues (i.e., share personal information), assuming that less individuation would correspond to deindividuation. In the chat-room, before the experiment began those in the individuation condition were asked to answer a few questions that would increase the feeling of being different from other participants (e.g., what is your favorite movie?), thereby making them feel like a distinct entity. Those in the deindividuation condition were not asked these questions, so as to not induce a sense of a distinct self but to allow a sense of group identity to emerge. Subsequently, the experimenter provided four hypothetical scenarios about a person who needed

to make a decision (see Appendix). These decisions involved a choice between a high risk (more rewarding but less likely to achieve) and a low risk action (less rewarding but more likely to achieve) (Kogan & Wallah, 1967). As an example, the following scenario was presented during the practice session:

> Amy and John are college students who have been living together in an apartment near campus. John's allowance buys food and they are sharing the rent. Amy has told her parents that she is rooming with another girl, and now her parents are coming to visit their daughter. They have never seen the apartment. Amy is considering asking John to move out for the time that her parents are in town. What should Amy do?

After the scenario was presented, each participant took turns providing his/her opinion on what that person should do by choosing among 6 options (e.g., definitely should tell her parents, should tell her parents, probably should tell her parents, probably should ask John to leave, should ask John to leave, definitely should ask John to leave), with a brief explanation why. The order of providing opinions among participants was ostensibly based on who logged on first, and was determined by the experimenter. However, the order was rigged so that the real participant always had to provide his/her opinion first. For three scenarios, based on the participant's response, 'other' participants provided opinions that were in agreement with the participant's opinion. For instance, for each scenario, participants were provided with 6 response options to choose from, such as "definitely should do A," "should do A," "probably should do A," "probably should do B," "should do B," and "definitely should do B." If the participant answered, "should do A," 'other' three participants answered with "probably should do A," "should do A," and "definitely should do A." In order to avoid suspicion, the 'other' participants did not agree with the participant's opinion for one scenario. For each of the scenarios, 'other'

participants provided their reasons from one of the two sets of prearranged arguments, depending on what the real participant answered. Hence, all participants read the same arguments by the 'other' participants, provided the directions of their opinions were similar. Prior to the main experiment, as a practice round, subjects were provided with one scenario to become familiarized with the procedure. The experiment largely followed the procedure employed by Lee (2007).

After the discussion, the experimenter guided participants to a survey website (www.qualtrics.com) where they completed online questionnaires. First they were provided with the same four scenarios they discussed, and were to indicate their final opinions on those scenarios. Subsequently, they filled out questionnaires measuring personalization, public self-consciousness, sense of agency, and self-awareness, along with other demographic information.

At the end of the questionnaire, participants were instructed to go back to the chat-room to be debriefed by the experimenter, where they learned about the details of the study. Specifically, they were informed that the experiment was actually on examining how group interactions affected perceptions of control and conformity, and were explained that deceptions regarding the presence of 'other' participants along with the study's purpose were necessary to understand these perceptions of control and conformity.

Measures

Group polarization. Group polarization (i.e. exaggeration of the group opinion) was measured by the extent of the participant's change in opinion. Specifically, each participant's initial opinion provided in the chat-room was compared with their final opinion provided in the questionnaires. Polarization was determined by how much more extreme their final opinions became. For instance, if the participant's opinion moved in the opposite direction of the group's

or did not change at all, a '0' was assigned to the polarization level. If the opinion moved from 'probably should do A/B' to 'should do A/B', a '1' was assigned, and if the opinion moved from 'probably should do A/B' to 'definitely should do A/B', a '2' was assigned.

Personalization. As a validation check, personalization was measured to make sure that participants in the individuation condition personalized the 'other' participants more so than those in the deindividuation condition. The personalization index created and used in the study by Lee (2004) was adopted in this study. Specifically, participants evaluated each of the 'other' participants on competence (competent, intelligent, reasonable, informed; alpha = 0.91 for participant 1, 0.93 for participant 2, and 0.91 for participant 3) , perceived similarity to oneself (similar to me, think like me, shared my beliefs; alpha = 0.91 for participant 1, 0.94 for participant 2, and 0.96 for participant 3), and argument quality (convincing, relevant, valid; alpha = 0.91 for participant 1, 0.90 for participant 2, and 0.92 for participant 3) on a 10-point scale, ranging from describes very poorly (1) to describes very well (10). These ratings for each of the 'other' participants were compared against one another, and the absolute differences in each of those ratings were summed, reflecting the level of differentiation among the 'other' participants. The larger the difference perceived between the other participants, the greater participants' perceived personalization during the experiment, implying a lower group salience/immersion.

Public self-consciousness. Public self-consciousness was measured by employing a subscale of the Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975). This is a six-item self-report questionnaire that assesses the general awareness of the self as a social object, e.g., "I was aware of my appearance". Participants read statements such as "I was concerned about the way I present myself" and rated how much they experienced as described in the statements during the experiment from not at all (0) to very much (4). Cramer (2000) recently reviewed this

subscale metric and reported good internal consistency (Cronbach's alpha = 0.84). In the current study, the consistency was found to be 0.81.

Voluntariness. Self-control was measured by employing the involuntariness subscale of the Sense of Agency Rating Scale (Polito, Barnier, & Woody, 2013), and reverse-scoring it to measure 'voluntariness'. Involuntariness is a five-item scale, and assesses the extent of automaticity with actions and focus on an external locus of control, e.g., "my responses were involuntary". Participants read statements such as "I chose how to respond" and rated how well they agreed with them from strongly disagree (1) to strongly agree (7). Polito et al. (2013) found this measure to have good internal consistency with Cronbach's alpha at 0.91. In the current study, the consistency was found to be 0.57.

Immediate surrounding self-awareness scale. Immediate surrounding self-awareness was measured using a subscale of the Situational Self-Awareness Scale (Govern and Marsch, 2001). This three-item scale assesses self-awareness level of the immediate surroundings, e.g., "I was keenly aware of everything in my environment". Participants were to think about how they felt during the experiment, and evaluate how much they would agree with the statements they were provided from *strongly disagree* (1) to *strongly agree* (7). Govern and Marsch (2001) found this measure to have good internal consistency with Cronbach's alpha as 0.72. In the current study, the consistency was found to be 0.80.

Private self-awareness scale. Private self-awareness was measured using a subscale of the Situational Self-Awareness Scale (Govern and Marsch, 2001). This three-item scale assesses the level of private self-awareness, e.g., I was conscious of my inner feelings. Participants were to think about how they felt during the experiment, and evaluate how much they agreed with the statements they were provided from *strongly disagree* (1) to *strongly agree* (7). Govern and

Marsch (2001) found this measure to have good internal consistency with Cronbach's alpha as 0.70. In the current study, the consistency was found to be 0.83.

Results

Manipulation checks

Before the hypotheses described above were tested, manipulation checks were performed to validate the individuation manipulation (i.e., did those in the individuation condition feel that the participants were distinct entities more so than those in the deindividuation condition). Also demographics between the two conditions were compared to ensure that random assignment to conditions resulted in roughly equal distributions.

First, the manipulation of individuation was checked by comparing the personalization measure (i.e., perceived difference among 'other' three participants on competence, similarity to oneself, and argument quality) against the two conditions using a one-way ANOVA. It was expected that those in the individuation condition would have higher personalization scores than those in the deindividuation condition. However, contrary to expectation, the mean personalization measure was the same for both conditions (Individuation: $M = 40.79$, $SD = 25.06$; Deindividuation: $M = 40.79$, $SD = 30.31$), implying that the individuation manipulation was not successful.

Next, demographics for the two conditions were examined to make sure that random assignments resulted in roughly similar distributions, as would be expected if the random assignment were successful. There were no noticeable differences between the groups on the demographic variables with one exception: gender. There were noticeably more females than

males in the individuation condition (19 female, 9 male) compared to those in the deindividuation condition (14 female, 14 male).

Despite these two findings, the study hypotheses were tested accordingly. It is important to note that among the 56 participants who provided data, two reported being suspicious of the deception during the debriefing session, and ten exited the experiment before being debriefed. Data analyses were conducted with and without these twelve participant's data, and there were no differences in the results. For that reason, all participant data are included in the following analyses.

Deindividuation and Polarization

Given that the validation check indicated that the manipulation of conditions did not work, data were filtered for participants in the individuation condition with personalization score above the mean and participants in the deindividuation condition with personalization score below the mean. This allowed for analyzing data only from participants who were effectively individuated in the individuation condition and who were deindividuated in the deindividuation condition. Using this filtered data, the first hypothesis was tested which states that those exposed to deindividuating cues would show greater change towards the group norm (i.e., polarization) compared to those not exposed to such cues. Using a one-way ANOVA, polarization was examined between the two conditions. Contrary to what was found in previous literature, participants in the individuation condition showed greater levels of polarization (M=0.28, SD=0.30, N=13) than those in the deindividuation condition (M=0.11, SD=0.21, N=15) and the effect for condition on polarization measures was marginal, ($F(1,26) = 3.17$, p=0.09), likely due to the reduced sample size.

In addition, the hypothesis was tested on all data without the filter, and the pattern remained the same: participants in the individuation condition showed greater levels of polarization (M=0.27, SD=0.31) than those in the deindividuation condition (M=0.10, SD=0.20), and there was a significant effect for condition on polarization measures ($F(1,54) = 6.42$, $p<0.05$). Hence, the first hypothesis was not supported.

Self-control as a Mediator of the Relationship between Deindividuation and Polarization

The second hypothesis proposed that the relationship between deindividuating cues and deindividuating effects (i.e., attitude polarization) would be mediated (i.e. explained) by a decrease in self-control. Since the manipulation was not successfully induced, this hypothesis was modified as: the relationship between the usage of anonymous chat-names and polarization would be mediated by a decrease in self-control. Mediation was tested by using the recommendations from Baron and Kenny (1986). Mediation requires the demonstration of three effects – a significant effect between a predictor and a mediator, between a predictor and an outcome, and between a mediator and an outcome. This was tested on both filtered data (i.e., data from participants in the individuation condition with personalization score above the mean and participants in the deindividuation condition with personalization score below the mean) and the full data (i.e., data without filter). However, no significant correlation between predictors (i.e., condition) and mediators (i.e., each of the self-control measures), nor between outcome (i.e., polarization effects) and mediators was found for both sets of data (see correlations for all study variables in Table 2, 3). Thus, the second hypothesis was not supported.

Self-control as a Moderator of the Relationship between Deindividuation and Polarization

The third hypothesis proposed that the relationship between deindividuating cues and deindividuating effects (e.g., attitude polarization) would be moderated by (i.e. changed by)

differing levels of self-control. Since the manipulation was not successfully induced, this hypothesis was modified as: the relationship between the usage of anonymous chat-names and polarization would be moderated by differing levels of self-control. In order to test this hypothesis, hierarchical regression analyses were used. Predictor variables – condition, and each of the self-control measures (i.e., public self-consciousness, voluntariness, immediate self-awareness, and private self-awareness) - were entered in separate blocks into the regression equation, and incremental *F* test of the difference in R^2 between the blocks of variables were computed and examined after each predictor was added to the model. The order of entry was condition (Step1), self-control (Step2), and interactions of condition x self-control (Step3). Regression analysis was performed separately for each of the four self-control measures, and was performed using the filtered data and the full data. Scores for self-control were standardized for this computation, and this was done for each of the four self-control measurements. The regression results show a significant main effect of condition at Step1 (corroborating that individuation led to increased polarization), but no significant main effects of self-control at Step2, and no significant interaction effects between self-control and condition at Step3 for both sets of data (see Table 4, 5). Hence, the third hypothesis was not supported.

Post-hoc Analysis

Despite random assignment to conditions, there were noticeably more females in the individuation condition than the other. Since women tend to show higher rates of conformity than men in general (Eagley & Wood, 2012), additional tests were conducted to examine whether gender influenced the extent of polarization. A 2x2 ANOVA was conducted for condition and gender, with polarization as a dependent variable. Results indicate a significant main effect of condition ($F(1, 52)=4.66$, $p=0.04$) and gender ($F(1, 52)=3.61$, $p=0.06$), but no

interaction effects ($F(1, 52)=0.01$, $p=0.93$). Specifically, females showed marginally greater polarization than males regardless of the condition, as shown in Figure 2, but gender did not moderate polarization. One possible reason for such gender differences may be that males might have had more ceiling effects by initially responding with extreme options (i.e., definitely should do A/B) because males tend to be more agentic and dominant in their viewpoints (Eagly, 2013). However, there were no noticeable differences between males and females in choosing their initial responses. For that reason, it may simply be that females polarize more often than males.

Discussion

The main purpose of this experiment was to validate that deindividuating cues influence individuals to exhibit more group polarization, as was shown in the study by Lee (2007), and further examine whether self-control was mediating or moderating this process. However, because the deindividuating cues were not successfully induced, the experiment failed to validate that deindividuating cues influence individuals to exhibit more group polarization. Instead, it was shown that individuals who used unique chat-names (i.e., individuation condition) exhibited more polarization, and perception of self-control was not involved in this process.

The lack of findings regarding polarization among individuals using anonymous chat-names (i.e., deindividuation condition) may have been due to the failure of differentiating deindividuation from individuation, as was shown in the insignificant difference in personalization scores between the two conditions, and this failure may have been due to the presence of an active discussant-moderator. This is because, in the study by Lee (2007), there may not have been a moderator during the discussion, since Lee mentions that other participant's answers were preprogrammed, implying that the discussion might have been held via computer

software in the absence of a human moderator. In the current study, the experimenter was present in the chat-room with her real name as the chat-name, and this may have induced the participant to perceive other participants as the "in-group", and the experimenter as the "out-group". Consequently, this might have effectively led participants to perceive other participants similarly in both conditions, and thus provide similar personalization scores. However, this manipulation failure does not seem to be the reason why there were such results. This is evidenced by the similar pattern that was exhibited when the data were filtered for participants with high personalization scores in the individuation condition and those with low personalization scores in the deindividuation condition.

Since the experiment was conducted in a remote location from the experimenter, it is possible that participants were not attentive and were distracted during the experiment. If distraction was involved, participants using unique chat-names (i.e., individuation condition) might not have noticed the individuation cues, and thus behaved similarly as those using anonymous chat-names (i.e., deindividuation condition). In order to see if distraction confounded the process thereby caused participants with unique chat-names to polarize more, the tests were re-run with polarization measured only using the first scenario assuming that participants would be more attentive in the early stages of the experiment. However, when the two conditions were compared in just the first scenario, there was a more pronounced difference between the two conditions where participants using unique chat-names showed even more polarization ($F(1,54) = 7.07$, $p<0.05$). Hence, distraction was ruled out as the reason contributing to this result.

Another possible explanation lies in unequal gender distribution. Since there were noticeably more females than males in the individuation condition, it may be that the greater number of females shifted the level of polarization in the individuation condition. However,

given that there was a clear main effect of condition, and no interaction effect between condition and gender, gender did not seem to fully explain why participants with unique chat-names (i.e., individuation condition) showed more polarization than participants using anonymous chat-names (i.e., deindividuation condition).

Another possible explanation for the findings may be a reduction in conformity pressure due to less social presence. Contrary to what the SIDE model suggests, it may be that anonymity, particularly the anonymity of being behind a computer with no one physically near you, allows individuals to feel protected from social pressures, and thus reduce the normative influences that might exist. In this case, although both conditions led participants to remain un-identified (i.e., anonymous), participants using anonymous chat-names (i.e., deindividuation condition) did not share personal information with one another, and thus may have experienced less social presence than participants using unique chat-names (i.e., individuation condition), and thus felt less need to conform (i.e., polarize). On the other hand, participants using unique chat-names may have experienced more social presence and therefore were more likely to conform/polarize.

Interestingly, Reicher (1984) and Lea and Spears (1991) found that when individuals were not immersed in their group, anonymous participants showed less polarization than individuated participants, possibly because they were experiencing less social presence. In the current study, although participants using anonymous chat-names (i.e., deindividuation condition) were expected to be immersed in their group identities, this manipulation did not work. This may be why participants using anonymous chat-names showed less polarization than participants using unique chat-names, consistent with the findings by Reicher (1984) and Lea and Spears (1991). However, when examining the results among participants who were successfully manipulated (i.e., participants with high personalization scores in individuation

condition and low personalization scores in dedindividuation condition), the same pattern of results was found. For that reason, group immersion does not seem to fully explain why the results showed such patterns.

Alternatively, group cohesion might have had an impact on the findings. Taylor and MacDonald (2002) found that sharing personal information (i.e., individuation) induces a significantly higher sense of group cohesion (e.g., group connectedness) than when deindividuated in a CMC setting. The reasoning for this is that in the absence of nonverbal cues which one would see in an in-person setting (e.g., facial expression), individuating cues in a CMC setting (i.e., sharing personal information online) might actually increase group cohesion. Hence, it is possible that participants using unique chat-names (i.e., individuation condition) in the current study felt a stronger sense of group cohesion than participants using anonymous chat-names (i.e., deindividuation condition) due to sharing of information, thus influencing them to experience more social presence, and thereby polarizing more. Conversely, participants in the deindividuation condition may have experienced less group cohesion given their anonymous chat-names, and thus felt less need to conform to the group's norm. Unfortunately, group cohesion was not expressly measured in this study, so this remains an avenue for future research/experiments to test.

Regardless of the conditions, explicit self-control does not seem to be associated with polarization behaviors, as they were shown to neither mediate nor moderate them. This also implies that contrary to what the SIDE model suggests, concern for self-presentation is not involved, at least on an explicit level. This is because some level of self-control must be involved in managing one's presentation. However, given that this experiment was based on a fairly small sample, and that the tests used to examine mediation/moderation were stringent analyses (Hayes,

2009), it is possible that the study did not have enough power to detect reliable mediation or moderation effects. Moreover, the low Cronbach's alpha of the voluntariness scale (a self-control measure) may have dampened the effect of self-control via that assessment. This low reliability may have been due to fatigue by participants, as it was noted that many participants indicated their answers in the same direction for the reverse-scored items. Hence, although there was no significant effect of self-control in the deindividuation process, it is possible that this might have been detected with a larger sample size, a less stringent statistical analysis, and/or better control on fatigue effects.

There are several limitations to this study that deserve pointing out. First, manipulations should have been thoroughly checked through a pilot study, so that participants would be successfully induced in the main experiment. However, given the small sample size used, this experiment itself could serve as a pilot study for future purposes. Second, unequal gender distribution could have been controlled for by employing stratified random assignments. This is because although gender did not statistically impact polarization effects due to conditions, such control would have provided a clearer picture. Third, as mentioned above, the sample size was fairly small and therefore may not have allowed sufficient power to reliably detect the effects. Also, given the low alpha level for the voluntariness scale, it is very likely that this self-control scale was not properly measured. Lastly, because the experiment was conducted remotely without any physical supervision by an experimenter, it is likely that many participants were not entirely attentive throughout the experiment. In fact, there were a few times when the experimenter accidentally typed in with the wrong chat-name.[1] However, none of the participants

[1] The incidence of such typing errors occurred less than five times. Unfortunately, these incidences were not explicitly recorded, so this could not be reflected in the analysis.

reported that they noticed such errors during debriefing, and this may be because they were engaging in other tasks simultaneously during the experiment.

For future studies, it would be helpful to use a larger sample size. Also, to avoid fatigue effects in surveys, certain words in the reverse-scored items could be presented differently (e.g., underline or capitalize) so that participants do not misread the sentences. To avoid distraction, participants could be required to use computers that monitor any online activities during the experiment. Also, in order to better understand the polarization pattern exhibited in this study, group cohesion could be additionally measured and tested to see whether it mediates the deindividuation process. Lastly, it would be informative to see whether this process is generalizable in an older population and/or different cultural settings. For instance, since conformity behaviors vary by different age cohorts (e.g., Pasupathi, 1999), there may be some differences in the polarization behaviors. In this study, there was not a large enough sample size to reliably detect behavioral differences due to age. Also, since collectivistic cultures tend to exhibit stronger group cohesion than individualistic cultures (e.g., Triandis, 2001), if there is a stronger polarization effect in the collectivistic culture, this may be supporting evidence that group cohesion is involved in the deindividuation process.

Despite these limitations, the results of this study provide some understanding about how CMC may influence deindividuation and individuation effects. With increasing communications held online where communities of various interests exist, this study may be useful in understanding whether and how polarization occurs in the online world, where varied levels of personal information is shared. In social network spaces, like-minded people come together to discuss topics that they are commonly interested in, and this likely leads to attitude/behavior polarization. These effects may be pro-social if the topic is on volunteering, but may be

destructive if the topic is on prejudice and hate against a certain group. Hence, understanding this process within a CMC will allow us to become mindful of polarization effects and possibly change the conviction of collective positions, especially when the effects are destructive.

Conclusion

The purpose of this experiment was to examine whether deindividuation influences individuals to exhibit group polarization, and further examine whether self-control mediates or moderates this process. However, individuation manipulation was not successfully induced, and participants using unique chat-names (i.e., individuation condition) reported greater polarization than those using anonymous chat-names (i.e., deindividuation condition), and perception of self-control was not involved in this process. Although the data did not support the hypotheses proposed, it raises a question on whether group cohesion, rather than anonymity (i.e., lacking personalization), is what leads to deindividuation effects of conformity in a CMC settings. Hence, for future studies, research on group cohesion will help to advance our understanding on the deindividuation process.

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Table 1

Demographic characteristics of participants assigned to deindividuation and individuation conditions

	Deindividuation (N=28)		Individuation (N=28)		Total (N=56)	
Characteristic	N	%	N	%	N	%
Gender						
Male	14	50%	9	32%	23	41%
Female	14	50%	19	68%	33	59%
Age (M±SD)	20.29±2.58		20.50±3.11		20.39±2.86	
School year						
Freshman	9	32%	8	29%	17	30%
Sophomore	8	29%	11	39%	19	34%
Junior	10	36%	4	14%	14	25%
Senior	1	4%	5	18%	6	11%
Computer Usage Frequency						
A few times a week	1	4%	2	7%	3	5%
1-2 times a day	1	4%	6	21%	7	13%
3-5 times a day	7	25%	8	29%	15	27%
5 or more times a day	19	68%	12	43%	31	55%
U.S. Born?						
Yes	17	61%	18	64%	35	63%
No	11	39%	10	36%	21	38%

Table continued

Table 1 continued

Work full/part time?						
Yes	14	50%	13	46%	27	48%
No	14	50%	15	54%	29	52%
Estimated household income						
Less than $10K	1	4%	5	18%	6	11%
$10K-30K	10	36%	5	18%	15	27%
$30K-60K	7	25%	9	32%	16	29%
$60-100K	8	29%	5	18%	13	23%
$100K+	2	7%	4	14%	6	11%

Table 2

Correlation between mediators and predictor/outcome variable for filtered data

	Self-control measures (Mediator)			
	Public self-consciousness	Voluntariness	Immediate surrounding self-awareness	Private self-awareness
Condition (Predictor)	0.03 (p=0.87)	0.03 (p=0.90)	-0.07 (p=0.72)	-0.18 (p=0.37)
Polarization (Outcome)	0.07 (p=0.73)	0.11 (p=0.59)	0.00 (p=0.98)	0.07 (p=0.73)

Note: Deindividuation condition was coded as 0, and individuation condition was coded as 1.

Table 3

Correlation between mediators and predictor/outcome variable for full data

	Self-control measures (Mediator)			
	Public self-consciousness	Voluntariness	Immediate surrounding self-awareness	Private self-awareness
Condition (Predictor)	0.10 (p=0.46)	0.02 (p=0.89)	0.04 (p=0.77)	-0.18 (p=0.19)
Polarization (Outcome)	0.07 (p=0.60)	0.12 (p=0.39)	-0.08 (p=0.58)	-0.11 (p=0.42)

Note: Deindividuation condition was coded as 0, and individuation condition was coded as 1.

Table 4

Summary of hierarchical regression analyses for variables predicting polarization for filtered data (N=28)

	SC: Public self-consciousness				SC: Involuntariness				SC: Immediate surrounding self-awareness				SC: private self-awareness			
Variable	B	*SE* B	β	R^2	B	*SE* B	β	R^2	B	*SE* B	β	R^2	B	*SE* B	β	R^2
Step1				0.11				0.11				0.11				0.11
Condition	0.17	0.10	0.33^{t}		0.17	0.10	0.33^{t}		0.17	0.10	0.33^{t}		0.17	0.10	0.33^{t}	
Step2				0.11				0.12				0.11				0.13
SC	0.02	0.05	0.06		0.03	0.06	0.10		0.01	0.04	0.03		0.03	0.04	0.13	
Step3				0.11				0.12				0.11				0.13
Condition x SC	0.01	0.11	0.03		-0.05	0.13	-0.62		0.02	0.07	0.19		-0.02	0.10	-0.22	

^{t} $p < 0.10$

Note: Deindividuation condition was coded as 0, and individuation condition was coded as 1.

Table 5

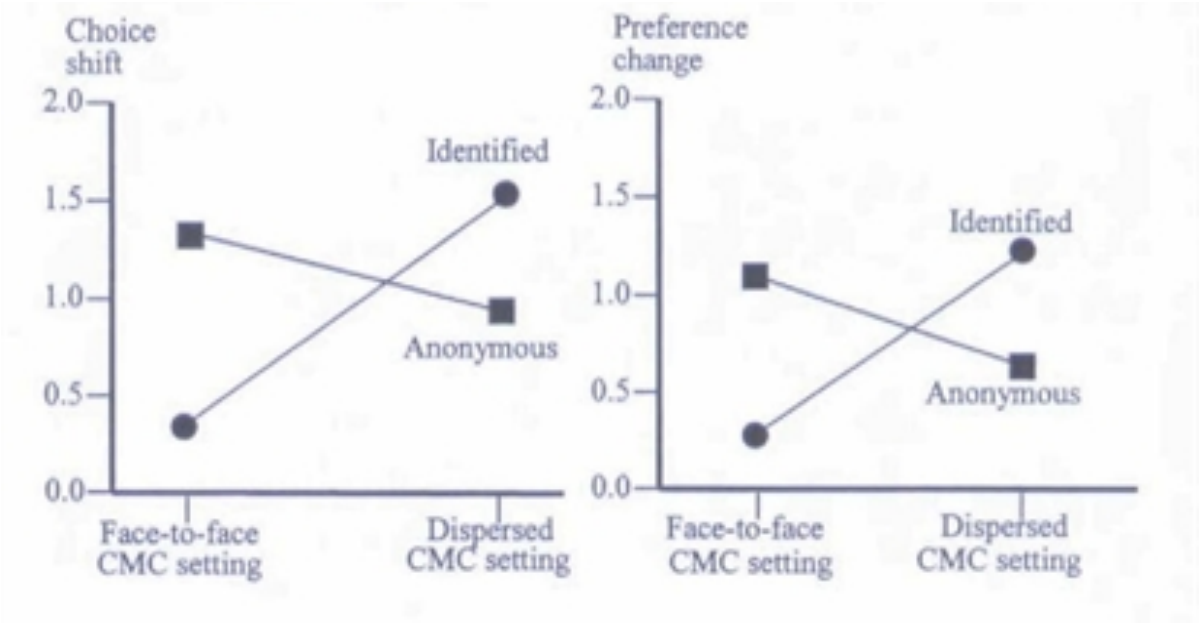
Summary of hierarchical regression analyses for variables predicting polarization for full data (N=56)

	SC: Public self-consciousness				SC: Involuntariness				SC: Immediate surrounding self-awareness				SC: private self-awareness			
Variable	B	*SE* B	β	R^2	B	*SE* B	β	R^2	B	*SE* B	β	R^2	B	*SE* B	β	R^2
Step1				0.11				0.11				0.11				0.11
Condition	0.18	0.07	0.33*		0.18	0.07	0.33*		0.18	0.07	0.33*		0.18	0.07	.33*	
Step2				0.11				0.12				0.11				0.11
SC	0.01	0.04	0.04		0.03	0.04	0.11		-0.02	0.03	-0.09		-0.01	0.03	-0.05	
Step3				0.12				0.14				0.11				0.11
Condition x SC	-0.06	0.07	-0.13		0.09	0.08	0.19		0.01	0.05	0.03		0.02	0.06	0.07	

* $p<0.05$

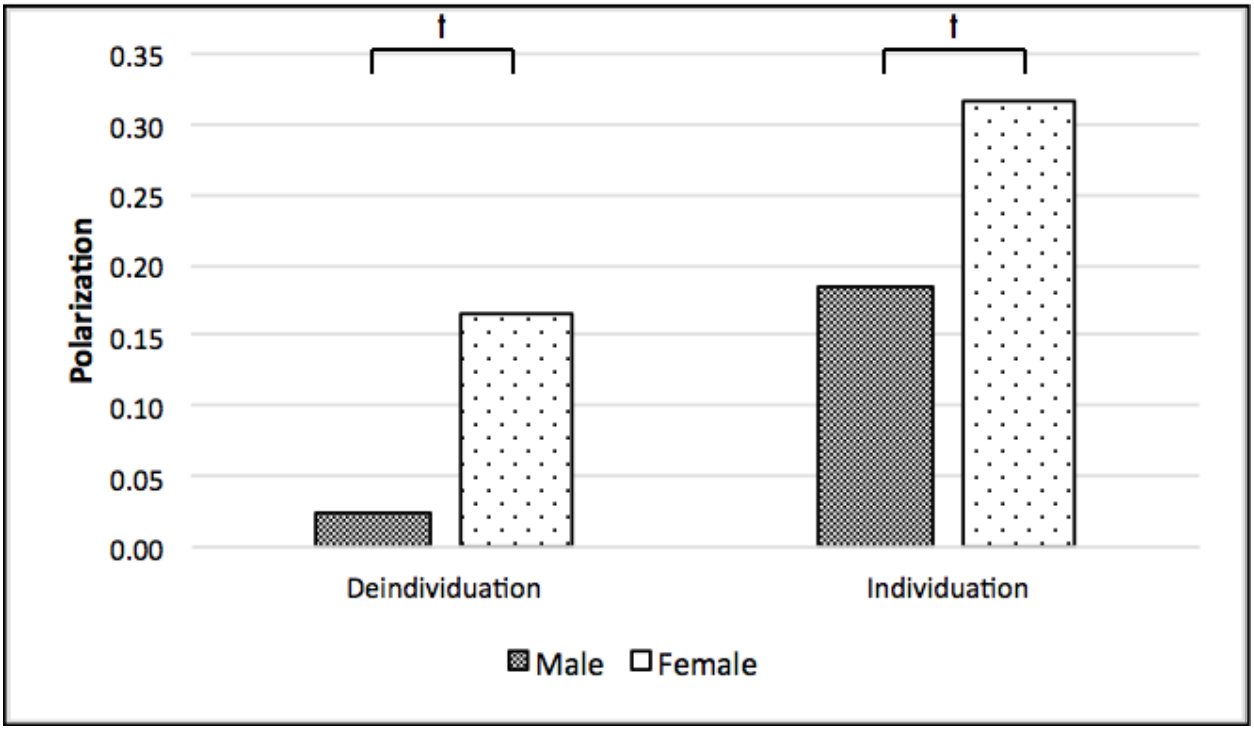
Note: Deindividuation condition was coded as 0, and individuation condition was coded as 1.

Figure 1.



Graphical presentation of group polarization.(Sia et al, 2002, p.81)

Figure 2.



Graphical representation of group polarization by condition and gender.

t $p < 0.10$

Appendix

Hypothetical scenarios involving choice dilemmas used for the experiment

Scenario 1) Ms. E., a college senior, has studied the piano since childhood. She has won amateur prizes and given small recitals, suggesting that she has considerable musical talent. As graduation approaches, she has the choice of taking a medical school scholarship to become a physician, a profession which would bring certain financial rewards, or entering a conservatory of music for advanced training with a well-known pianist. She realizes that even upon completion of her piano studies, success as a concert pianist would not be assured. What should Ms. E do?

1 – definitely should take the medical school scholarship

2- should take the medical school scholarship

3 – probably should take the medical school scholarship

4 – probably should go to the conservatory of music

5 – should go to the conservatory of music

6 – definitely should go to the conservatory of music

Scenario 2) Mr. G. is a surgeon with a well-established surgical practice. He is married and has three children, one of which is just starting college. During a backyard session of football, he seriously dislocated his shoulder. Although the shoulder was properly reset at the time, the dislocation produced some nerve damage and he has been experiencing a great deal of pain ever since. An operation is available that will relieve the pain if completely successful, but the operation also poses a risk of producing a permanent decrement in manual dexterity. The decrement in dexterity is normally inconsequential, but in his case, it could prevent him from continuing his surgical practice. What should Mr. G. do?

1- definitely should not go through the operation

2- should not go through the operation

3- probably should not go through the operation

4- probably should go through the operation

5- should go through the operation

6- definitely should go through the operation

Scenario 3) Mr. D, a married man with two children, has a steady job that pays him about $60,000 per year. He can easily afford the necessities of life, but few of the luxuries. His father, who died recently, carried a $40,000 life insurance policy. He would like to invest this money in stocks. He is well aware of the secure "anon7945 chip" stocks and bonds that would pay approximately 6% on his investment. On the other hand, he has heard that the stocks of relatively unknown Company X might double that present value if a new product currently in production is favorably received by the buying public. However, if the product is unfavorably received, the stocks would decline in value. Which stock should Mr. D buy?

1- definitely should buy the secure "anon7945 chip" stocks and bonds

2- should buy the secure "anon7945 chip" stocks and bonds

3- probably should buy the secure "anon7945 chip" stocks and bonds

4 – probably should buy Company X stocks

5- should buy Company X stocks

6- definitely should buy Company X stocks

Scenario 4) Ms. F is contemplating marriage to Mr. P, a man whom she has known for a little more than a year. Recently, however, a number of arguments have occurred between them, suggesting some sharp differences of opinion in the way each views certain matters. Indeed they

decide to seek professional advice from a marriage counselor as to whether it would be wise for them to marry. On the basis of these meetings with a marriage counselor, they realize that a happy marriage, while possible, would not be assured. What should Ms. F do?

1- definitely not marry Mr. P

2- should not marry Mr. P

3- probably should not marry Mr. P

4- probably should marry Mr. P

5- should marry Mr. P

6- definitely should marry Mr. P