

Conference on Group Processes in Computer-Supported Interaction: Technological and Social Determinism

CONFERENCE PROGRAM



April 1-2, 2005

Marcum Center
Miami University
Oxford, Ohio

This conference is supported by a grant from the
National Science Foundation

Conference on Group Processes in Computer-Supported Interaction: Technological and Social Determinism

Conference Theme

The use of computer-supported interaction has become a primary feature of communication among group members, due in part to its structural (freedom of time and geographical constraints) and psychological (anonymity) features. As a consequence, many group researchers have investigated the role of group process variables in computer-supported interactions. Because groups communicate via the use of computers in many personal, educational, and professional settings, it is important to continue and encourage the study of group processes in such environments. One theoretical issue that is implicit in many of the studies of group process variables in computer-supported interaction is whether technology is deterministic or determined. Spears and Lea (1994) recognized this issue when discussing whether technology was a panacea, allowing for greater freedom of expression and equality of status, or a panopticon, limiting expression and increasing control due to its ability for surveillance. The purpose of this conference is to bring together a diverse group of researchers with established programs of research on group processes in computer-supported interaction. This conference should serve to make the theme of technological and social determinism more explicit, thus leading to greater unity in the dominant research programs. The conference will offer a unique and timely theme, and is cross-disciplinary and cross-cultural.

This conference is supported by a grant from the National Science Foundation and the Department of Psychology, Miami University.

Special thanks to Karen Schilling and the Department of Psychology for their support.

Thanks to Dave Mueller and Lizz Howard for their assistance.

Conference Organizers: Beth Dietz-Uhler, Zak Birchmeier, and Gary Stasser.

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Schedule

Friday, April 1

Time	Event
8:00-9:00	<i>Registration (Foyer/Lobby)</i> <i>Continental breakfast (Room 158)</i>
SOCIAL IDENTITY (Room 112)	
9:00-9:45	Russell Spears (Cardiff University/University of Amsterdam), Martin Lea (University of Manchester), Tom Postmes (University of Exeter), Anka Wolbert (University of Amsterdam), & Sue Watt (University of New England) <i>A Broad SIDE: The Cognitive and Strategic Effects of Computer-Mediated Communication</i>
9:45-10:30	Tom Postmes (University of Exeter) <i>An Interactive Model of Social Identity Formation in Online Groups</i>
10:30-10:45	<i>BREAK (Foyer/Lobby)</i>
10:45-11:30	Craig McGarty and Girish Lala (The Australian National University) <i>Opinion-Based Groups: Talk and Action on the Internet</i>
SOCIAL INFLUENCE (Room 112)	
11:30-12:15	Adam Joinson (The Open University) <i>Who's Watching You? Power, Personalization and On-line Compliance</i>
12:15-1:30	<i>LUNCH (Room 158)</i> <i>POSTER SESSION ONE (Kimmerle & Cress; Rebaza; Kumagai et al.; Stern et al.; Gaudagno et al.; Kim; Cress et al)</i>
1:45-2:30	Melanie Green (University of Pennsylvania) <i>Responses to the Problem of Trust On-line</i>
2:30-4:30	<i>Break for Psychology Department Colloquium (Peter Glick)</i>

GROUP PERFORMANCE (Room 112)

5:00-5:45	Andrea Hollingshead (University of Illinois at Urbana-Champaign) <i>Strategic Information Sharing and Influence in Computer-mediated Group Decision Making</i>
5:45-6:30	Discussion (Scott Tindale)
7:00-9:00	<i>DINNER (Room 158)</i>

Saturday, April 2

Time	Event
8:00-9:00	<i>Registration (Foyer/Lobby)</i> <i>Omelets-Cooked-to-Order breakfast (Room 158)</i>
GROUP PERFORMANCE (Room 112)	
9:00-9:45	Alan Dennis (Indiana University) <i>Individual Cognition in Electronic Groups</i>
9:45-10:30	Poppy McLeod (Case Western Reserve University) <i>Anonymity in Computer-Mediated Communication in Groups: An Absence of Social Identity?</i>
10:30-10:45	<i>BREAK (Foyer/Lobby)</i>
10:45-11:30	Suzi Weisband (University of Arizona) <i>Leadership assignment in virtual teams: How does prior interaction affect team performance?</i>
11:30-12:15	Susanne Abele (Erasmus University Rotterdam) <i>Bounded Rationality Starts with the Encounter of the Game</i>
12:15-1:30	<i>LUNCH (Room 158)</i> <i>POSTER SESSION TWO (Lam & Arrow; Boucher & Jacobson; Baker; Howard et al.; Courte; Carey & Wade; Parker et al; Sheeks)</i>

TYPES OF GROUPS (Room 112)

1:45-2:30	Kai Sassenberg (University of Jena) <i>One of Many or Part of the Whole?</i> <i>The Impact of (Perceived) Group Type on Social Influence in Computer-Mediated Interactions</i>
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RELATIONSHIP DEVELOPMENT (Room 112)

2:30-3:15	Kip Williams (Purdue University) <i>Ostracism in Cyberspace</i>
3:15-3:30	<i>BREAK (Foyer/Lobby)</i>
3:30-4:15	Joe Walther (Cornell University) <i>Who Am I This Time? The Conflicted Nature of Self and Relating in Computer-Mediated Communication</i>
4:15-5:00	Discussion (Scott Tindale)

Conference on Group Processes in Computer-Supported Interaction: Technological and Social Determinism

Presenter Abstracts

Social Identity

**Russell Spears (Cardiff University/University of Amsterdam), Martin Lea (University of Manchester), Tom Postmes (University of Exeter)
Anka Wolbert (University of Amsterdam), & Sue Watt (University of New England)**

A Broad SIDE: The Cognitive and Strategic Effects of Computer-Mediated Communication

The social identity model of deindividuation effects (SIDE) is a framework for understanding a range of social psychological effects of computer-mediated communication (e.g., social influence, stereotyping, group attraction, audience and power effects), and analysing these in terms of characteristic properties of these media (visual anonymity, isolation, and communication of support). We provide an overview of the model, review research it has generated, and present recent work on the effects of gender which point to some interesting extensions of both the cognitive and strategic dimensions of the model.

**Tom Postmes
University of Exeter**

An Interactive Model of Social Identity Formation in Online Groups

Although research into virtual communities and online groups spans several decades, their phenomenology remains powerfully paradoxical. Despite the abundance of "weak" interpersonal ties, the Internet has become a rich mixture of groupings that are profoundly meaningful and influential to those involved. The virtual space is filled with communications that replicate and amplify familiar identities, social categories, and social issues, and sometimes we witness the emergence of new social identities and novel groupings. How is it that chat and personal interaction form and feed these rich subcultures? This paper argues there are distinct ways in which social identity is formed. In some groups a common identity is available or given, and norms for individual behavior may be deduced from group properties. Other groups are formed on the basis of interpersonal relations. Here a group identity may be induced from individual group members' contributions, making individuality and individual

distinctiveness a defining feature of the group. Several studies examined the conditions under which social identity is successfully induced or deduced in online groups. Their results suggest new reasons why the abundance of interpersonal communication on the internet may give rise to group processes that explain its powerful social influence.

Craig McGarty and Girish Lala
The Australian National University

Opinion-Based Groups: Talk and Action on the Internet

In this presentation Craig McGarty will present a useful tool for understanding aspects of the social psychology of (political and social) action diffuse settings such as the Internet. The focus will be on social identities based around shared opinions. He will then discuss an application of this broad approach developed by Girish Lala focusing on action (and the lack of action) in on-line communities designed to promote social and political causes. One key proposition is that the nature and purpose of on-line communities can become readily transformed from being about action to being about talk.

Social Influence

Adam Joinson
The Open University

Who's Watching You? Power, Personalization and On-line Compliance

Anonymity, in various guises, has been one of the key aspects of people's online experiences used to explain CMC effects. This is similarly true in the domain of survey methodology anonymity, or at least reduced researcher presence and increased technological mediation of participant responses, has been linked to the reduction of a number of response biases. In this talk, I will examine the trend towards the personalization of people's Internet experience, and look at the implications of this on anonymity, and behavior. A series of experiments using survey methodology are outlined, in which the role of personalization on compliance behavior online are examined, and implications drawn.

Melanie C. Green
University of Pennsylvania

Responses to the Problem of Trust On-Line

The online environment presents a challenge for establishing trust. Individuals recognize the possibility of deception, and this can lead to a lower general trust in individuals (strangers) encountered on the Internet. This presentation will explore individual and technological strategies that attempt to separate trustworthy interaction partners from untrustworthy ones. These strategies include reputation systems in online communities (such as Ebay's feedback system), identity verification in interpersonal relationships, and online groups designed to capitalize on existing social networks.

Group Performance

Andrea B. Hollingshead
University of Illinois at Urbana-Champaign

Strategic Information Sharing and Influence in Computer-Mediated Group Decision Making

Anyone who has been a member of a committee, task force or board of directors can attest that information sharing in groups is often strategic: it is goal-directed, intentional and conscious. I will present data from a series of studies that examine the strategies that members use to influence others in computer-mediated group decision making. Taken together, the studies suggest that goals and incentives have powerful and similar effects in determining information sharing strategies and influence in computer-mediated groups as they do in face-to-face groups.

Alan Dennis
Indiana University

Individual Cognition in Electronic Groups

Previous research shows that computer-mediated communication (CMC) can significantly improve the exchange of information within teams, but this improved information exchange usually does not improve decisions, because participants fail to consider the new information they receive from other team members. The tendency to ignore new information may be attributable to social factors (e.g., a dominant majority may overwhelm a minority) but another potentially fruitful line of inquiry may lie in cognitive explanations – that is, the extent to which individual cognition fails in electronic groups. This presentation will examine the results from a series of studies designed to understand individual cognition in electronic groups.

Poppy Laretta McLeod
Case Western Reserve University

Anonymity in Computer-Mediated Communication in Groups: An Absence of Social Identity?”

The central question addressed in this paper is, what is the essential definition of anonymity? The paper develops the thesis that anonymity can be defined based on a principle of social identity group matching. The extent to which others cannot match together certain of one’s identity group memberships, according to this principle, one has a degree of anonymity to those others. This basic definition is then applied to a framework describing the multi-dimensionality of anonymity. Implications of the definition and framework for future research on computer-mediated group communication are discussed.

Suzi Weisband
University of Arizona

Leadership assignment in virtual teams: How does prior interaction affect team performance?

We conducted a study to examine the behaviors and roles that are enacted by team-assigned leaders in virtual team settings. Specifically, we analyzed quantitative and qualitative data to identify differences between team members who were selected as leaders and those who were not in terms of their behavior as manifested in their electronic communication. The longitudinal study involved 23 temporary virtual teams composed of graduate and undergraduate students who participated in a social issues of computing course at a university. The results show that early interaction by team members and leaders influenced who was selected as the team leader. Team-selected leaders posted more and longer electronic messages than their team members did, and they were responsible for contributing to the team’s improved performance, as compared to teams who did not select their leader. These findings are discussed and their implications for early interaction in virtual settings are elaborated in the paper.

Susanne Abele
Erasmus University Rotterdam

Bounded Rationality Starts with the Encounter of the Game

Interdependent decision-situations can be modeled by games. Experimental games provide a tool for studying effects of the mere nature of the interdependency on social perception and behavior.

According to the fundamental attribution error, the situation is underrepresented in people's attribution of behavior. The extended argument is made that before one knows the behavior, the situation can affect the perception of other players, which can in turn affect the behavior.

Consequently, the way an opponent is perceived may depend partly on the game people are playing, even before the game is played. Moreover, these initial impressions subsequently affect decisions and decisions, in turn, further modify impressions of the opponent.

Types of Groups

Kai Sassenberg
University of Jena

One of Many or Part of the Whole? The Impact of (Perceived) Group Type on Social Influence in Computer-Mediated Interactions

Following Prentice, Miller and Lightdale (1994) common identity groups (in which the group as a whole attracts the members) should be distinguished from common bond groups (in which relations to other group members are the social glue). This talk will discuss how this difference between groups impacts on group members' self-perception and subsequently on social influence processes within the groups.

Relationship Development

Kipling D. Williams
Purdue University

Ostracism in Cyberspace

Theories argue that our need to belong to a few important others is so strong that we are highly vigilant to signals of relational devaluation. Our research on ostracism extends this argument to even non-important others: when we detect that we are being ignored and excluded, even by strangers that we will never

meet, our sense of belonging is threatened. Furthermore, belonging is not the only thing that is threatened: ostracism also thwarts our self-esteem, sense of control, and our sense of meaningful existence (i.e., recognition by others as worthy of attention). We have examined ostracism in a variety of electronic media, including the Internet, intranet, chat rooms, and cell phones. In general, regardless of media, ostracism is detected quickly and is perceived as painful and distressing. A few interesting differences emerge between face-to-face ostracism and cyber ostracism and these will be discussed and explored.

Joe Walther
Cornell University

Who Am I This Time? The Conflicted Nature of Self and Relating in Computer-Mediated Communication

Within the study of relationships online, conceptualizations both of the self and of relating have become conflicted and contested. This essay first reviews the nature of self as it is reflected in a variety of theoretical approaches to online social interaction and how the self is treated in these paradigms with respect to its stability or malleability as a function of interaction. Next, the nature and measurement of relating is examined, with particular respect to relationships in online groups. Measurement concerns are explored with respect to conceptual, presentational/administrative, and potentially artifactual issues.

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Poster Abstracts Friday, April 1 (12:15-1:30)

Joachim Kimmerle & Ulrike Cress

Visual Anonymity in Computer-Supported Interaction – The Ambiguous Effect of Portraits on Behavior in an Information-Exchange Situation

In many situations of computer-mediated communication it is a significant problem that a lot of participants do not actively take part by contributing information but prefer “lurking” (Preece, Nonnecke & Andrews, 2004). It is thought that the high anonymity in computer-supported information exchange would probably be an obstacle to active participation. Usually participants do not know each other personally. Due to the missing social cues they scarcely regard themselves as members of a group with one common goal and as a result primarily pay attention to their own requirements. This orientation towards personal interests lessens an individual’s effort to provide one’s own knowledge to others. To reduce anonymity and the resulting disadvantages, some communication tools allow integrating portraits of the group members. These portraits provide at least some impression of the people involved and make the participants more aware of the others as well as of the group as a whole. At first glance this attempt to enhance group awareness seems to be a feasible variant to change a person’s focus from his personal needs to those of others. However, research based on the Social Identity-Deindividuation-Effect (SIDE) Model (Reicher, Spears & Postmes, 1995) provides evidence that such portraits can also yield the converse effect of making the group less salient. The SIDE Model expects visual anonymity to have varying effects depending on the current self-categorization: In the mode of *group identity*, visual anonymity increases the salience of the group. If anonymity is reduced, a user receives information about the heterogeneity of the group, which in turn lowers the subjective perception of being part of one group with one general group norm. In the *personal identity* mode, visual anonymity extends a person’s perceived distance to the group. If portraits are available, the other participants become more substantial, enhancing the prominence of the group.

To test this ambivalent effect of portraits, an experiment in an information-exchange setting was conducted. In this experiment, groups of six people performed a task in which group members acquired information that others could possibly use and that could be contributed to a shared database. In contrast to the most previous SIDE studies, we did not only examine the

portraits' impact on attitude but also on *behavior*. Therefore our results have significant implications for practical applications of virtual settings. Each participant had to complete a pre-test questionnaire which measured *social orientation* (Van Lange, Otten, De Bruin, & Joireman, 1997). This questionnaire showed whether a person was mainly oriented towards his own interests and needs (individual orientation) or towards those of others (prosocial orientation). We regard this trait as a reasonable indicator for social identity in uncertain situations: Personal identity is supposed to be more salient for people with individual orientation, and group identity for people with prosocial orientation. This is an additional important innovation in our experiment: We did not induce social identity via experimental treatment but accounted for an existing *trait*. In the experiment half of the participants worked with a shared database providing portraits of the other group members, while the other half worked without such portraits. The contribution rate, showing how much of their information people contributed to the database, served as dependent variable. A 2-factorial ANOVA with the factors *social orientation* and *anonymity* revealed a significant main effect for social orientation: People with individual orientation contributed less than those with prosocial orientation. As expected, there was no main effect of anonymity, but a significant interaction between social orientation and anonymity. For participants with individual orientation, portraits led to higher contribution rates, whereas for prosocial participants, portraits led to lower contribution rates.

Steven E. Stern, University of Pittsburgh at Johnstown,
John W. Mullennix, University of Pittsburgh at Johnstown
Muriel Dumont, Catholic University of Louvain
Ilya Yaroslavsky, University of Pittsburgh at Johnstown

*Social Perceptions of Disabled and Non-Disabled Users of Synthetic Speech:
Evidence for Positive Prejudice and Black Sheep Effects*

Overview

The proposed poster presents a synthesis of four studies (one published, two in submission, one just completed) that are part of a larger program on social perceptions of computer synthesized speech. The data has provided some interesting patterns of interest related to group processes, including the black sheep effect, positive prejudice and situational ambiguity.

Participants

Each of the four studies examined has between 100 and 200 research participants. All were undergraduates at a 4 year undergraduate college.

Method

Each participant listens to a persuasive appeal, and subsequently rates the argument, speaker, and the message on semantic differential scales. In each of the four studies we manipulated different variables, as follows:

Study 1: Disability (disabled vs. nondisabled)

Study 2: Source (student-ingroup vs. computer-outgroup)

Study 3: Disability (disabled vs. nondisabled) and Purpose of appeal (unpleasant vs. unspecified)

Study 4: Disability (disabled vs. nondisabled) and Music as distraction (control, pleasant, unpleasant)

In general, the responses to the instruments are reduced by factor analysis, and the resulting dependent measures are subjected to factorial ANOVAs.

Results and Discussion

In this limited space, I will provide a summary and brief interpretation of the results of each experiment, as follows:

Study 1: Human speech is viewed positively compared to synthetic speech. This difference diminishes if the speaker is believed to be disabled. There is evidence of the Black Sheep effect, as the evaluation of the disabled user (a member of an outgroup) is less extreme for both pleasant (human) and unpleasant (synthetic) speech. There is also evidence of positive prejudice, as the disabled user of synthetic speech is viewed more favorably than the non-disabled user of synthetic speech.

Study 2: Human speech is viewed more positively when delivered by a student (ingroup), while synthetic speech is viewed more positively when delivered by a computer (outgroup). When there is a “mismatch” participants react less positively toward the human speech, and less negatively toward the synthetic speech. This is evidence of Black Sheep effect and suggests that computers may, under certain circumstances, be treated as if members of an outgroup.

Study 3: The findings reveal a 3 way interaction whereby the positive prejudice toward disabled users of synthetic speech is diminished when another negatively perceived factor is present (the target is engaged in a telephone campaign). This provides evidence of situational ambiguity, whereby the telephone campaign provides enough of an excuse for the participants to feel comfortable expressing a negative perception of the disabled target.

Study 4: In study 4, we find an interesting contrast to Study 3. For both the disabled and nondisabled targets, distracting music leads to lower evaluations. However, for the nondisabled target, the irritating music leads to even lower evaluations (compared to pleasant music), while the specific type of music has no effect on evaluations of the disabled target. Hence, with an irritating distraction that is not viewed as controllable by the target, the positive prejudice persists.

Ulrike Cress, Joachim Kimmerle, Stefan Martin & Friedrich W. Hesse

Costs, Benefits, and Guidelines in Computer-Supported Interaction – How to Overcome the Information-Exchange Dilemma

The performance of a group working collaboratively depends very much on the group members' ability and willingness to share their knowledge. Shared databases are a tool for supporting exchange of knowledge. By entering information into the database, group members can make their knowledge available to others, and each member can use the information that others contributed. Indeed, when shared databases are implemented for information exchange, the problem arises that group members often are not willing to share their knowledge. The reason for that reluctance is that the decision to enter information into a shared database represents a typical instance of a social dilemma: Potential knowledge providers derive no individual benefit from contributing information. They only accrue costs (time, effort, loss of power). A group member can only benefit from the database by retrieving provided information. Therefore, withholding information is the most reasonable strategy for an individual. But if all members behave in that way, there is no information exchange at all, and all involved persons end up worse off than if they had co-operated. In order to investigate this dilemma empirically, we developed an experimental setting where sharing information sets up such a dilemma. The dilemma is established by the amount of money participants can earn during the experiment. On the one hand, the less information a participant contributes to the shared database, the more s/he earns. On the other hand, the mean payoff for all group members is higher if all decide to contribute than if no one contributes.

Within this experimental environment we carried out a series of experiments and tested how the following factors influenced the group members' behavior.

- Importance of information: The experiment examined whether handling important information leads to different contribution behavior than handling less important information.
- Bonuses: Another study tested the effect of a use-related bonus system. This is a kind of bonus-system where participants receive a bonus each time one of their contributions is used by one of their group mates.

- Costs: For investigating the effect of contribution costs, a low costs condition was compared to a high costs condition.
- Guidelines: In a further experiment we tested whether guidelines – which suggest how many pieces of information a participant should contribute – influence contribution behavior.
- Feedback: We established social norms through feedback about the other group members' behavior, and we compared high to low social norms. In all the studies of this series we found interesting results which support our assumption that both structural and psychological approaches are able to influence the group members' contribution behavior in an information-exchange dilemma.

Rosanna E. Guadagno, University of California, Santa Barbara
Jeremy N. Bailenson, Stanford University
Andrew C. Beall, University of California, Santa Barbara
Aleksandar Dimov, University of California, Santa Barbara
James J. Blascovich, University of California, Santa Barbara

Transformed Social Interaction and the Cyranoid: The Impact of Non Verbal Behavior on Persuasion in an Immersive Virtual Environment

We are all familiar with the story of Cyrano de Bergerac who loved Rosalyn, but provided prose to help another man to woo her. From his name, Stanley Milgram coined the term "cyranoid" to describe an intermediary that communicates with a target using the words or non-verbal behavior of another individual. To examine the use of a cyranoid in social interaction, Milgram conducted a study in which participants interacted with an individual who, unbeknownst to them, was a cyranoid whose words were being controlled by a third party. Milgram described cyranoids as: "People who do not speak thoughts originating in their own central nervous system: Rather, the words they speak originate in the mind of another person who transmits these words to the cyranoid by radio transmission" (Milgram, Sabini, & Silver, 1992).

In the present research, two studies examined the impact of Transformed Social Interaction (TSI; changing the nature of a social interaction by altering how individuals are rendered to perceivers in an Immersive Virtual Environment; Bailenson, Beall, Loomis, Blascovich, & Turk, 2004) on persuasion via the use of a cyranoid. In this case, a research assistant attempted to persuade two research participants on a counter-attitudinal topic during a multi-person interaction in an Immersive Virtual Environment (IVE).

We employed a cyranoid to communicate via the rendered head movements of the research assistant. The cyranoid attempted to provide persuasive head movements to accompany the persuasive passage read by the research assistant to the two research participants. The cyranoid was instructed to

engage a particular participant during the interaction. We expected that targeted non-verbal engagement by a third party (i.e., the cyranoid) would be more persuasive than a natural interaction (no TSI), an augmented TSI in which the persuader appeared to stare at all targets in the interaction 100% of the time, or a reduced TSI in which the persuader appeared to look away from the targets 100% of time. We expected this because a cyranoid can provide tailored non-verbal engagement because she does not have to split her attention between words and movements – the cyranoid’s sole duty was to engage the target non-verbally.

Results indicated that as compared to the other conditions, participants who were engaged by the cyranoid remembered more details of the persuasive passage, engaged in more mutual gaze with the persuader, liked the persuader better, and perceived more engagement via eye-contact. Additionally, participants were more persuaded as compared to the no TSI interaction (i.e., natural interaction) but not more so than the augmented TSI condition. Our second study replicated and expanded on these findings by demonstrating that a cyranoid who is knowledgeable about non-verbal behavior and persuasion is more effective than one who is not. Thus, the results of this study have several implications for computer-supported social interaction and group processes.

Claudia Rebaza
University of Illinois, Urbana-Champaign

10,000 Pixel Back Channels: Icon Use by Fan Fiction Writers on LiveJournal

In her 2002 literature review, “Computer Mediated Communication on the Internet,” Susan Herring stated: “To date, Internet CMC research has had a text bias,” primarily because early forms of software were designed for simple text communication. She poses the question, “How do different channels of communication interact to construct rich, multilevel meanings?”

LiveJournal (LJ), a blogging website, has since its inception in 1999 attracted a significant number of fan artists to adopt its software for both personal and group uses. User pictures, which are commonly referred to by fan artists as icons, are graphic images, usually photographs, 100 x 100 pixels or fewer. Icons optionally accompany each user’s posting on either their own journal, or in commentary posts on other journals. Icons must be located or created, chosen, and uploaded to each user’s account, yet they almost invariably accompany every user’s post made on LJ. This study focuses on the functions icons serve within two specific groups of fan artists, including the way that icons may be utilized as a “back channel” for emotional communication.

The more tightly knit a community is, the more likely individuals are to share similar practices, vocabulary, and an understanding of non-verbal communication. Observing the ways in which different online groups use icons indicates that such “non-verbal” communication is intentional, noticed, and understood. In a medium devoid of physical representation, icons allow subgroups of a larger fan fiction and fandom group to develop and share their lore more easily, as well as maintain visibility within the quantity and variety of discourse created by the larger group.

Observations of over 500 posts in two LJ community groups were coded for posting activity, content elements, distribution of icons, frequency of use, and intended audience. Icons were found to demonstrate community values and practices; were being used for added layers of communication; and icons reflected the existence of social networks, and social worlds. Although the intended purpose of “user pictures” (the LiveJournal term) was to provide images of the users themselves, icons (the community’s term) are rarely employed in this fashion in this study. Instead, of six apparent functions of icons within these communities, the most significant employed was one of emotional communication, of mood from the poster and "active listening" from the respondents. Icons function as "emotional apparel" providing a richer, multilevel meaning to the textual foreground. Although the use of icons to represent personal identity was significant and widespread, icons were often equally employed to represent community membership and values.

Tomohiro Kumagai, Hiroshi Oikawa and Ken-ichi Ohbuchi
Tohoku University

The Effects of Perceived Fairness and Trait Self-esteem on Third Party Aggression

In this study, we attempt to examine the social psychological processes of the third party’s aggressive intervention into inter-group conflicts focusing on the interaction between fairness and trait self-esteem.

Third party aggression is defined as an aggression against a harm-doer engaged by an individual who does not directly suffer any harm. We assumed that social identity variables mediated the motivational processes of it. When an individual observed the other who share the same category (ingroup member) being harmed, he felt that his social identity was threatened and motivated to retaliate against the harm-doer even if he was not personally harmed. In this study, we focused on two variables. One is fairness by ingroup. We suggested that the perception of fairness by ingroup would enhance identification to that ingroup (Hypothesis 1). Although enhanced group identity might make individual perceives other-directed threat as to their own threat, we conjectured that the effect of group identification on third party aggression would be moderated by other variables. The other variable is trait self-esteem.

Previous study has indicated that while people in high trait self-esteem are robust to threat to self, those who in low trait self-esteem are sensitive to negative evaluation to self. Based on above discussion, we hypothesized that participants in low trait self-esteem would aggress more intensively than those who in high in trait self-esteem when they observed unfair allocation to ingroup member who treated fairly participant previously (Hypothesis 2).

Forty participants were randomly assigned into one of four conditions across 2 (equality: equal vs. unequal) x 2 (Trait self-esteem: high vs. low) factorial design. In the first session, participants in the equal condition were equally allocated lottery tickets by ingroup member, whereas participants were allocated fewer tickets than an allocator in the unequal condition. As this allocation was conducted through PC, no participant met other participants. In the second session, the participants observed that the ingroup member was unfairly allocated by outgroup member and then were asked to evaluate the fairness of allocation. Participants were explained that the rating of fairness was associated with different levels of unpleasant noises and the selected noises were given to the allocator. In the second session, either allocation or evaluation was conducted through PC. The measure of aggression was the intensity of noises that participants delivered against the allocator. Participants further answered to a questionnaire to measure trait self-esteem, group identification, perception of threat, and hostility. Results showed that the fair treatment by the ingroup member enhanced group identification. Moreover, participants in equal/low self-esteem condition aggressed more severely to the allocator than participants in other three conditions. Structural equation analysis indicated that only participants who in low self-esteem perceived harm to ingroup member as threat to their own, as we hypothesized. Implications for future research are discussed.

Junghyun Kim
Michigan State University

The Effects of Differentiated Depersonalization, the Anticipation of Future Interaction and Need for Uniqueness on Individuals' Conforming Behavior in Computer-Mediated Group Decision-Making

Anonymity has been one of the most important factors in studying people's behavior in computer-mediated groups. However, research on the effect of anonymity on group decision-making has produced controversial results depending on diverse performance indicators of group decision-making including decision quality, the quantity of ideas generated or members' satisfaction with group decision. This study points out three possible reasons for the inconsistency: 1) Lack of clarity in classifying different levels of anonymity, 2) Lack of attention on individual level variables (psychological and personal attributes) based on the assumption that the impact of anonymity is indiscriminate to all the group members, and 3) Omission of the anticipated

future interaction possibility. This study focuses on two other variables that had been neglected in the previous Group Decision Support Systems (GDSS) studies: group consensus-reaching and individual choice making within the mediated group decision-making contexts. Therefore, this study investigates differentiated depersonalization conditions, individual differences in need for uniqueness and the possibility of future interaction as factors that could affect individuals' choice making in a computer-mediated group whose norm is consensus reaching.

First, based on the depersonalization concept from the Social Identity of the Deindividuation Effects (SIDE) theory, this study investigates the relationship between the types of self-representations (whether group members are represented by the same or different avatars) in the computer-mediated group and the degree of individual members' conformity to group consensus norm. Second, based on the need for uniqueness framework, this study expects that people who have higher need for uniqueness might not be as conforming as those with lower need for being different from others. Then, how the environmental factor (self-representation) might interact with personal factor (need for uniqueness) will be examined by looking at the interaction between the two. Finally, the impact of the anticipated future interaction on individual members' conforming behavior will be investigated.

This study uses quasi-online experiment. The design of this experiment study is a 2 <with the anticipation of future interaction vs. without the anticipation of future interaction> × 2 <the same avatar (high depersonalization) vs. different avatars (low depersonalization)> between-subject factorial. Using a random assignment program, participants are randomly assigned to one of the four possible combinations of experimental conditions. Subjects are asked to participate in a series of discussions with four other people. Each discussion takes place in a chat room like window displaying conversation content among five people. After reading what other discussants say, subjects need to decide if they agree with the existing group members' opinions or not, which is used for the measurement of conforming behavior.

This study is expected to contribute to the computer mediated group decision making in three aspects. First, it combines group norms and depersonalization concept from social psychology into the computer mediated group decision-making research, which has been dominated by the efficiency maximization framework. Second, this study takes the individual domain variables into consideration in studying group dynamics of decision-making. Finally, this study tries to specify the boundary of SIDE theory by arguing that group members' conforming behavior could be differed depending on: 1) differentiated depersonalization contexts, 2) individual differences in need for uniqueness, and 3) the existence of the anticipation of future interaction.

Saturday, April 2 (12:15-1:30)

Jill Courte
Miami University Hamilton

Using Technology-Enabled Group Projects in a Computing Survey Class

The use of group projects in the classroom is a well-accepted pedagogical tool, benefiting both student and teacher. Generally, students are thought to gain experience in cooperative learning and teamwork while teachers can utilize more complex assignments that more closely mirror real-world projects. However, group projects are not without drawbacks. Students often have trouble arranging meeting times, groups may have a dysfunctional dynamic, and group members may feel different levels of commitment to a project. As more courses are taught online or in technology-enabled classrooms, these problems can be magnified as face-to-face interaction decreases. This poster session will report the results of requiring students in a computing survey course to use computer mediated communication to form groups and complete projects.

CSA 151 (*Computers, Computer Science, and Society*) is a survey course designed to provide a perspective on the potential and limitations of computing technology. Participants in this course regularly use computers in the classroom, labs or at home to complete assignments throughout the course. As a Miami Plan Foundation course, a high percentage of projects for the course are done collaboratively. The curriculum for the course also includes modules on tools for using computers for communication and how those modes of communication have changed the way people work and interact socially.

For this study, students in selected sections completed group projects with the object of creating a reference guide to resources available online for any topic of common interest to the group. In some sections, students were required to form groups which included members of different sections of the class. These students were asked not to meet face-to-face but instead to use discussion forums, chats, and email to identify a common interest and form their group. In other sections, groups were formed face-to-face in class in a more traditional manner. Once groups were formed, the groups which were formed across sections were required to complete their project using only computer mediated communication. The other groups were encouraged to meet face-to-face and only use computer mediated communication to supplement their activities.

The objectives of the study were the following:

1. To assess students' perceptions of using only computer-mediated communication with no face-to-face meeting to complete group projects.
2. To assess whether projects done strictly through computer-mediated communication affects students' sense of responsibility toward completing group projects.

It is expected that students in the groups which were formed between sections with no face-to-face communication and no prior familiarity between some or all of the participants will feel less commitment toward other members of the group and the project. For this poster session, I will report the preliminary results from this study.

**Robyn E. Parker, Ph. D., Albert L. Ingram, Ph. D., Tsui Yi Cheah, and the Collaborative Technologies Learning Community
Kent State University**

Collaborative Technology use in Higher Education Settings

Two trends affecting teaching and learning in higher education are: (1) the increasing importance of collaborative learning strategies and (2) the widespread availability of computers and networks. The Collaborative Technologies Faculty Learning Community at Kent State University is an interdisciplinary body of scholars studying technologies available to support group collaboration.

The community was established during the 2001-2002 academic year to explore the ways to use technology effectively in collaborative endeavors. Collaboration is an interactive process through which interdependent individuals integrate their efforts toward achieving shared objectives. That first year we examined how faculty used two specific collaborative technologies (WebCT and Groove) in teaching their classes. What we learned was that we did not fully understand the collaborative learning process as it relates to collaborative technologies.

Over the past 3 years the community has explored the various affordances of collaborative technologies and sought to provide guidance for implementing their use in higher education. Using a variety of research methods (survey, observation, interaction logs and interviews) the community has studied collaborative technology use from both the student and instructor perspective. The result is a rich case study exploring three sets of variables. The first set centers on the various capabilities of a series of collaborative software systems. The second set focuses on how the various capabilities were actually employed by students and faculty. The final set of variables involves the intersection of the other variables. This set is used to explore the processes and outcomes of the group as influenced by software capabilities and use.

A recent study involved faculty and Graduate Teaching Assistants across an eight campus system. Participants were asked a series of questions about

their use of technology in the classroom. Responses indicated technology was used primarily to facilitate group communication through email and chat rooms. Groups engaged in activities such as idea sharing, problem solving and decision making using collaborative tools. Collaborative technology tools were also used to facilitate instructor inspired discussion using a discussion board.

There were a number of respondents who used technology primarily to post information for students. One of the most striking results of this study was nearly ten percent of respondents reported disabling the collaborative tools such as email and the discussion board. The rationale faculty used for making the choice to disable the communication tools was inappropriate use by students.

This highlights one primary difference between collaborating on-line versus face-to-face. When collaborating on-line, there is a record of what has been “said”. This record is accessible to individuals outside the small group (i.e., the discussion board is accessible to all students in a class). Therefore comments made spontaneously during a discussion have a longer life and broader audience than in face-to-face contexts.

One thing we have learned is that we cannot separate the technologies from how they are used. Computers connected across networks provide an opportunity for us to change how we work in many ways. They can affect how and with whom we do research, how professors teach and students learn, and a variety of other processes. Some of these changes are already starting to take place using familiar technologies such as email. Much more is possible, however. Our goal in the Kent State University Collaborative Technologies Learning Community is to continue to explore some of the technologies available to enable and enhance collaboration with a view toward helping people make better choices about which ones to use.

JoAnne Carey, M.A. and Shari Wade, Ph, D. Cincinnati Children’s Hospital Medical Center

Computer Literacy as a Moderator to Therapeutic Alliance and Treatment Response in a Web-Based Intervention

Objective: Children with a traumatic brain injury (TBI) can incur cognitive and behavioral changes. Educating families about these possible changes and providing family-centered skill-building intervention may increase coping and problem solving thereby improving adaptation after brain injury. This presentation investigates how computer literacy may impact the perception of therapeutic efficacy in a web-based treatment for parents whose child has suffered a traumatic brain injury.

Method: We utilized a multimedia forum to provide Online Family Problem Solving (Wade, Wolfe, & Pestian, 2004). Eligible families had a child between the ages of 5-16 with a moderate to severe tbi. Families were provided with a

computer, web camera, and internet connection. A trained therapist visited the family's home once to build rapport and provide instructions on how to use the web-based intervention. The therapist was subsequently available by pager to answer technical questions the family encountered. Online session material consisted of self-guided web pages and synchronous one-on-one videoconferences with the therapist. Topics addressed included: the cognitive and behavioral effects of tbi and training in problem solving, behavior management, communication skills, and coping with parental stress. Parents completed a self report measure of depression and anxiety at baseline and follow-up.

Results: Families (n=20) had various levels of prior computer experience. This intervention provided some primary caregivers (n=6) the with their first computer exposure while others (n=14) were experienced computer users. After controlling for baseline levels of anxiety and depression, parents with prior computer use in their home reported significantly lower levels of anxiety (M=9.20, SD=4.96, p=.006) and depression (M=9.45, SD=7.19, p=.021) at follow-up than those without prior use. These differences were not attributable to differences in race or education level. Although parents without prior computer experience did not rate the intervention as less helpful than more computer-literate parents, there was a trend for non-computer users to rate the therapist as less caring and understanding and to report feeling less supported by the therapist. Comments from qualitative interviews suggest that technical problems potentially interrupted the "flow" of the intervention. Participants noted that sessions were extended over a longer period of time due to technical delays and lengthened due to difficulties with logging on, poor video quality, or lack of sound.

Discussion: The web-based intervention provided unique therapeutic opportunities, increased accessibility, and increased perceptions of confidentiality. We looked specifically at the ability of the intervention to improve depression and anxiety in parents with and without prior home computer use. Individuals with less computer experience appeared to view the therapeutic relationship less positively and did not show the same improvements in depression and anxiety as those with prior computer use. These findings suggest that individuals with limited prior computer experience may be less able to benefit from an online intervention, partly due to a less robust therapeutic alliance. To be effective with families with low computer literacy, subsequent interventions may need to address these factors.

Jasmine Lam & Holly Arrow
University of Oregon

The More the Merrier? Or Four's a Crowd? Preferences for Dyadic or Small Group On-line Conversations

In a face-to-face (FTF) setting, gender and social skills both appear to influence people's preferences for interacting in dyads versus larger groups. Males tend to prefer groups, whereas females generally prefer dyadic interactions in both childhood (Waldrop & Halverson, 1975) and adulthood (Tannen, 1990). Men and women with weaker social skills are typically more satisfied with dyadic interactions (Burleson & Samter, 1994), possibly because the higher quantity of social information in larger groups can overwhelm them. In the "leaner" format of asynchronous text-based on-line communication, the reduced information processing load may make larger group conversations easier to handle.

This study investigated whether the gender and social skills effects on group size preferences observed in FTF settings would replicate for on-line interactions. Participants were 160 college students (80 women and 80 men), recruited based on their scores on Duran's (1983) Communicative Adaptability Scale, a measure of social skills. Within each of the 20 sets (half female, half male) of eight same-sex participants recruited, people were assigned to have "get-to-know-you" conversations on an electronic bulletin board first in a dyad, and then in a four-person group (or vice versa). They were matched up so that each conversation was with strangers and had equal numbers of people with low or medium social skills. After completing both conversations, participants indicated which conversation they preferred and which conversation they judged to be smoother, more interesting, more difficult, and more comfortable.

Logistic regression analyses examined whether social skills and gender predicted preferences for dyadic versus small group conversations. Results indicated that gender significantly predicted preferences ($p=.001$), replicating the gender patterns reported in the literature for FTF interactions. Women preferred dyads at a rate of 2.5 to 1 (57 out of 80 choices), while men showed a weaker tendency to prefer small groups (47 out of 80, ratio of 1.4 to 1). In line with their overall preference for the dyadic conversations, most women judged the dyadic conversations to be smoother, more comfortable, and less difficult than the group conversations. The men, however, split about equally in their judgments of whether dyads or small groups had the advantage on these variables.

Being classified as having low versus medium social skills did not predict preferences or judgments, failing to replicate the preference for dyads found for less socially skilled people in the Burleson and Samter study (1994). This result is consistent with the hypothesis that group conversations are less socially demanding in an on-line than in a FTF setting. Conversation order significantly predicted which conversation was judged to be most interesting ($p < .01$). Those who interacted in the small group first typically preferred found

this conversation to be the more interesting of the two (57 out of 80, ratio of 2.5 to 1), whereas those who interacted first in a dyad were equally likely to choose dyads or quartets as the more interesting conversation.

Eliane M. Boucher & Dr. Jill A. Jacobson
Queen's University

Shyness Isn't Everything: Causal Uncertainty as a Predictor of Computer-Mediated Communication Use

A great deal of research has focused on the effects of personality factors such as shyness and social anxiety on the use of computer-mediated communications (CMC), including e-mail, instant messengers and Internet chat rooms. However, while some researchers have found that socially anxious and lonely individuals are more likely to use this medium to interact with others (cf. McKenna & Bargh, 2000), others have failed to find this relationship (e.g., Birnie & Horvath, 2002; Scealy, Phillips, & Stevenson, 2002). To clarify the relationship between social anxiety and CMC use it might be informative to examine the role of other potential factors, such as *causal uncertainty*, which is positively associated with loneliness and shyness (Jacobson et al., 1997). Causal uncertainty is an individual difference in the degree to which we are confident in our ability to correctly identify the causes of social events (Weary & Edwards, 1994). While we have all felt causally uncertain at some point in our lives, these beliefs are more accessible for some than for others. Specifically, high causally uncertain (CU) individuals have chronically accessible doubts about their causal inferences in social situations. Therefore, high CU individuals might prefer CMC because of its increased levels of anonymity and control over the timing and the nature of interactions (cf. Culnan & Markus, 1987). To examine how causal uncertainty might influence one's use of computer-mediated communications, participants (N=626) completed a series of questionnaires assessing various aspects of their CMC and face-to-face (FtF) interactions: (1) satisfaction with CMC, (2) satisfaction with FtF, (3) preference for CMC, (4) perceived convenience of CMC, (5) general social use of CMC, (6) CMC use for meeting new people, and (7) emoticon usage. And to measure participants' level of causal uncertainty and social anxiety, they also completed Weary and Edward's (1994) Causal Uncertainty Scale and Leary's (1991) Interaction Anxiousness Scale. As predicted, greater levels of causal uncertainty predicted less satisfaction with FtF communication. Interestingly, although causal uncertainty had no effect on one's satisfaction with CMC, greater causal uncertainty was associated with a preference for this medium. Moreover, our findings suggest that although high CU individuals may not communicate via CMC more than low CU individuals, *how* they use this medium does differ. For example, causal uncertainty predicted greater emoticon usage and more CMC use for meeting new people. Taken together, these findings suggest that high CU individuals prefer CMC to face-to-face

interactions because they can control various aspects of the conversation and that they take advantage of this added control in order to form new social relationships. And, more importantly, because social anxiety could not account for any of our causal uncertainty effects, this research offers a new predictor of CMC use that merits further examination.

Elizabeth V. Howard, CIT, Miami University Middletown

Jill Courte, CIT, Miami University Hamilton

Cathy Bishop-Clark, CIT, Miami University Middletown

Using Virtual Reality Through Alice and Pair-Programming to Teach Introductory Programming Concepts to Non Majors

Traditionally, programming courses were taught in a teacher-centered, lecture-based manner with an occasional in-class exercise using programming languages such as Visual Basic or Java. The majority of students find programming in such languages difficult to understand, difficult to use and not very motivating. The emphasis was placed on individual effort and collaboration among students was discouraged, and in some cases, strictly prohibited. This poster session will report the preliminary results of a study including two innovative approaches to teaching programming to non-majors: the use of paired programming and the use of the programming language Alice.

In CSA151, *Computers, Computer Science, and Society*, students study many aspects of computing, including a module on programming using the Alice programming language. Alice is a programming environment which makes it easier for students to create programs which are interesting and fun. Rather than having to correctly type syntactically correct commands, Alice involves a drop and drag technology which allows students to create interesting worlds and actions. For instance, traditionally a first program in C++ or Java displays the message “Hello World” to the screen. In Alice a first program may be of an ice skater skating across a pond.

For this study, in selected sections, students completed a programming project using Alice individually (this is the traditional approach to programming assignments). In other sections, students completed a programming project using Alice using the pair-programming paradigm. Pair-programming is when two people work on the same program at the same time on the same computer. One partner acts as the “driver” and the other partner acts as the “navigator.” Each partner takes turns being the driver or navigator, but both people actively participate in the entire process.

Our objectives in this study are:

- To assess the change in student perceptions about programming after using Alice
- To assess student perceptions of pair-programming
- To assess whether pair-programming affects student learning of introductory programming concepts

The study was divided into four phases:

In Phase I, students completed an anonymous questionnaire at the beginning of the programming module to provide a baseline of information on general attitudes and knowledge of programming concepts.

In Phase II, students completed tutorials and activities on programming and programming concepts using Alice. Some sections used the traditional individual approach to programming and other sections used the pair-programming paradigm.

In Phase III, students completed an anonymous questionnaire after they have completed the programming module to measure attitudes and knowledge or programming concepts.

In Phase IV, faculty not involved in the study will review and score the students' programming assignments from both groups (individual approach and pair-programming approach).

At this poster session, we will report the preliminary results from this study.

Andrea Baker
Ohio University

"I Heart U": Expressing Affection and Other Emotion After Meeting Online

This paper examines expressions of affection or the "verbalization" of love and commitment in online relationships in writing, before and after the first meeting offline. As part of a larger exploratory study of 89 online couples that met in cyberspace and then in physical space, the process of attraction to another person is examined through questionnaire data on relationship development online. People included in the study met each other first online, and both parties had to agree to complete the open-ended questionnaire. Interviewing and email correspondence supplemented the open-ended emailed questionnaires in some cases. The couples shared how they came to feel strongly about their partners before meeting offline, and also how they regarded each other after the first f2f encounter. Some of them provided data on how they expressed affection to each other through email or chat.

Detailed verbalizations of love in writing appear in emails of the couples, contributed by a small subgroup that voluntarily provided a selection of their written correspondence for the research.. Along with what attracted them and how they communicated online, couples discussed in the questionnaire what happened at the first meeting irl (in real life). They revealed their feelings toward their partners right before they met, and at the moment of first encountering the other person in physical space in words and behaviors, and then afterwards. How did the couples express and conceive of “love” both before and after meeting, in writing? Did the type of expression change after meeting irl, in adding the offline component to the purely online relationship? What kinds of textual devices did they use to communicate, such as emoticons or words of physical and emotional affection?

Attitudes towards each other before the first f2f encounter ranged from a strong liking to actually being in love. A few couples had not exchanged photos before meeting and felt attachment through text alone. Expressions of affection occurred before, during, and after meeting, along with plans to meet again. Following the trajectory of forms and content of statements and demonstrations of love can help us see what is unique about online romantic relationships, as well as what is similar to attraction and bonding among couples offline.

Miranda Sheeks
Miami University

Shyness, Sociability, and the Use of Computer-Mediated Communication in Relationship Development

The use of computer-mediated communication seems to offer benefits for shy individuals who also show a desire to be sociable and develop relationships with others. Individuals who are high in both shyness and sociability reported greater increases in satisfaction with and closeness in their online relationships.

Research by McKenna and colleagues has observed that people who are engaged in online relationships report that they can express their “true selves” to a greater degree. People who report higher levels of social anxiety are most likely to report a strong relationship between their degree of true-self expression and the quality of their online relationships. The current study was intended as a constructive replication of McKenna, Green and Gleason (2002; Study 1); we hypothesized that those who report high levels of both shyness and sociability would also show stronger links between reported changes in true self-expression and the quality of an online relationship.

Method:

Paper and pencil surveys were given to 220 university student participants in a mass testing session at the beginning of the fall semester. These surveys included scales of sociability, shyness, disclosure of one's "true self," CMC usage, and online relationship development based upon previously published research (Cheek & Buss, 1981; Jones, Briggs & Smith, 1986; McKenna, Green & Gleason, 2002; Parks & Floyd, 1996).

After performing a median split on the shyness and sociability variables, participants were categorized by their relatively high/low status. Using a stratified random sampling technique, 22% of the original sample was assessed again at the end of the semester. The same measures were used with the addition of a scale of relationship satisfaction (Hendrick, 1988).

Results:

All variables were standardized, and scale averages were computed for all measures (all alpha reliabilities > .7). A 2(time) X 2(high in both shyness and sociability or not) mixed ANCOVA was performed on the reported closeness of the online relationship. The calculated changes in CMC usage ($p < .01$), true-self expression (p ns), shyness (p ns) and sociability (p ns) were included as covariates. After equating participants on those variables, a nearly significant multivariate interaction between time and the shyness/sociability grouping was observed, $F(1, 32) = 3.86, p < .06$. Although loss of power precluded significant post-hoc tests, the means indicated that perceived closeness of the online relationship had grown over the course of the semester for those participants high in both shyness and sociability (Mean z change = .31), whereas online relationship closeness was perceived to decline by the rest of the sample (Mean z change = -.11). An ANCOVA of participant grouping on reported relationship satisfaction with changes in true-self expression (p ns), shyness (p ns) and sociability ($p < .05$) as covariates revealed a marginally significant main effect, $F(1, 38) = 3.19, p = .08$, such that those participants high in both shyness and sociability expressed greater satisfaction with their relationship (Mean $z = .35$) than the rest of the sample (Mean $z = -.13$).

Conclusion:

Extending McKenna et al.'s (2002) findings, the data suggest that individuals who indicate higher levels of both shyness and sociability also seem to report closer and more satisfying online relationships than those who indicate lower levels of those constructs. Contrary to our prediction, the degree of true self-expression was not a significant predictor of relationship development.