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The Impact of Internet Usage on Adolescent Self-Identity Development

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Abstract. This study examines the impact of Internet usage on the self-identity development in 10 students between the ages of 12 and 18. Using Erickson's Ego Identity Theory, the computer mediated communication (CMC) practices of students from private and public schools are evaluated through in-depth interviews. All students are frequent users of instant relay chat (IRC) and have a minimum of one year of experience with Instant Messenger. Identity development is examined using questions generated from a modified form of the Objective Measure of Ego-Identity Status developed by Adams and Ryan (2000). The four dimensions of Identity Development examined here are avoidance decision-making, identity formation, self-reflection and ego strength or fidelity. Results indicate Internet usage impacts each of these dimensions in the adolescents studied. Implications and limitations of the study are discussed. [China Media Research, 2007; 3(1):99-109].

Keywords: Internet usage, self-identity development, CMC, IRC

Introduction

Current understanding of adolescent self-identity development is primarily based on knowledge of traditional offline constructions and experiences. These influences focus on peer and parental/adult interactions and perceptions of self-esteem. Yet presently more than 7 hours of an adolescent's day is spent interacting with some form of media (Harrison, Taub, & Hayes, 2000). Ong (1982) pointed out that any media shift affects the interior state of the user and McLuhan (1964) went so far as to say that the medium itself "controls the scale and form of human association" (p.9). Because interpersonal communication is a key component in psychological development, CMC practices, which are often interpersonal in content become an important area of study for those interested in identity formation (McKenna, 1999).

It is Erickson's (1968) understanding that an optimum achieved identity status is represented by a sense of continuity between what one has become in childhood and what one will become in the future. The quality of our understanding of life experiences, values and beliefs fosters a level of continuity that strengthens our fidelity towards a particular self-concept. Therefore, evidence of this continuity in online interactions among adolescents is relevant to the evaluation of the Internet's impact on identity development. Yet, Gergen (2000) questioned whether study of "the impact of technology on psychological processes is premature" (p.201) since this assumes that foundational psychological processes are permanently established. In his view, the study of new media effects must be open to the possibility that they are *transforming* those foundations. Does this perspective put continuity at risk? Because current literature outlines specific effects of Internet usage in adults whose identity development is somewhat

stabilized, it becomes important to understand the impact of usage in adolescents who are just beginning this process. Thus, the purpose of this paper was to examine the impact of Internet usage on adolescent self-identity development.

Literature Review

Internet usage was conceptualized as actual hands-on time in front of the computer as well as the effects of perceived experiences in the cyberspace environment. Identity development was conceptualized as the Internet user's degree of commitment to a specific conception of self (Erickson, 1968).

The concept of identity development has been widely studied by scholars from different disciplines, including the social psychological (e.g., Adler, 1974; Cote & Levine, 2002; Erikson, 1950, 1963, 1968; Marcia, 1980, Tajfel, 1978; Waterman, 1992), communication (e.g. Brewer & Gardener, 1996; Martin & Nakayama, 1997; Ponterotto & Pederson, 1993), and critical studies (e.g. Althrusser, 1971; Katz, 1995). Presently, research on identity is expanding to consider influences from the realm of the Internet (Mantovani & Riva, 1999; McKenna & Bargh, 1999; Riva & Glimberti, 1998; Turkle, 1984, 1995, 1997).

Psychology and sociology approach the concepts of identity by different routes. The former lays its emphasis on the interior and interpersonal relationships, while the sociological viewpoint derives from interpersonal aspects and its concerns with intergroup and social-structural processes (Cote & Levine, 2002). In Cote and Levine's view, self-concept is not synonymous with identity but when reflected on "becomes the schema content for the domains of either personal or social identity" (p. 88). For Erik Erickson, when this process of reflection is activated, it propels

the individual forward through a series of developmental life stages or crises that results in the gain of a character virtue if successful or a character weakness if unsuccessful (Hergenhahn, 1984). This suggests that the essence of identity is formed through the interplay of the social and the psychic.

Erikson (1965) understood one of the main psychological functions of identity is to provide a sense of inner self-sameness and continuity, to bind together a person's past, present and future into a coherent whole. Pertinent to this continuity is the process of individuation or the ability to think and choose independently without fear of losing support from foundational relationships. The level of anonymity experienced in chat rooms and multi-user domains (MUDs) often produces an opposite condition called deindividuation, defined by Postmes, Spears, and Lea (1998) as "a psychological state of decreased self-evaluation causing antinormative and disinhibited behavior" (p.6).

Identity formation involves the individuation process and normally occurs between the ages of twelve and twenty. Erikson (1968) was careful to point out this stage of life is a time of searching for identity not necessarily achieving one. The inner search or "crises" takes place during a period of development called a psychosocial *moratorium* or a time between distinct phases of childhood and adulthood. This search also happens online.

According to McKenna and Bargh (1999), "people are turning to the Internet to meet important social and psychological needs" (p.2). Expressing identity is a strong self-motivator for using the Net. People who feel important aspects of their identity are unexpressed due to fear of a negative reception will often search chat rooms for role relationships in which to engage stigmatized aspects of their identity.

If the identity crisis stage is left without a successful resolution, the young adult may adopt a negative identity or a condition known as "role confusion" or the inability to choose a direction in life beyond one that is superficial at best. A positive resolution of the identity crisis results in the person gaining the virtue of fidelity which is "the ability to sustain loyalties freely pledged in spite of contradictions in value systems" (Erikson, 1964, p. 125).

The level of involvement one invests during this time of searching is often related to the seriousness of the risks perceived in doing so. Marcia (1980) recognized the difficulty in making commitments to the domains of gender role, occupation and ideology because of the risk factor. He named two dimensions of the identity process that frames these kinds of decisions as *exploration* and *commitment*.

To further help in measuring qualities of identity, Marcia defined four identity statuses in terms of these

dimensions. The first two statuses describe those who reach an understanding of their identity. Individuals who have searched for life's options and found acceptable paths are labeled identity achieved; those who find their sense of self by adopting their parents' views and values without further searching are called members of the identity foreclosed group. The remaining two categories are those of noncommitment, i.e., *moratorium* or those who look at possible life decisions but don't narrow them down, and *identity diffused* are those who don't see the importance of making one choice over another.

Archer (1989a) found that adolescents can be in different statuses with varying components of their identity. For example, one can be identity achieved in occupation, but foreclosed in gender role, diffused in ideology and in moratorium concerning faith issues. In addition to identity statuses, Waterman (1992) saw the *type* of commitment one makes toward identity as important. He observed that individuals who seek the most practical options to commit to when weighing life choices are not as satisfied as those who discover commitments "experienced as fully engaging and deeply held." Waterman labeled this dimension as "feelings of expressiveness," which advanced Marcia's (1980) two dimensions by focusing on *the optimal condition* for such commitments.

Waterman (1992) used "personal expressiveness" to describe one's personal daimon or "true self," based on the classical Greek understanding of expressiveness, meaning "those potentialities of each person...which represent the greatest fulfillment in living of which each is capable" (p.58). This is similar to Erikson's (1968) notion that the most secure identities are ones that enrich the relationship between the individual and society.

Two distinct motivations that drive Internet social behavior are self-related and group related (McKenna & Bargh, 1999). A self-motivator for Internet use is to present an image of the idealized self to gain approval and acceptance. This is done to gain rewards or to claim an identity for oneself. Social motivators for usage list a desire to disclose in order to gain intimacy. McKenna and Bargh (1999) indicated that disclosure of feelings and emotion-laden messages are strong predictors of intimacy in comparison with disclosing mere facts about the self.

The years of adolescence are a time open to an earnest search for personal values, a fundamental component of self-identity construction. Teens thrive on self-reflection at this stage in life and a shift from exterior to interior dialectic thinking proposes avenues to exercise new decision making skills. A confident sense of self-trust is needed to communicate one's chosen values and other self-concepts and without it, testing, adjusting, acceptance or rejection of these

internal constructs can enter a prolonged or adopted stage of inner conflict where a sense of *dualism* results (Harter, 1990). According to Bagnall (2000), some educators see kids who use the computer regularly as living in two distinct worlds, "one in which they are construed as dependent and passive, and the other in which they operate fearlessly, with great pleasure" (p. 29). The experience of telepresence as described by Riva and Galimberti (1998) outlines similar behavioral incongruities that may exist in cyberspace.

Telepresence or the CMC experience and its power of interactivity in virtual environments is becoming "increasingly immune to the balancing effects of direct experience and traditional social contexts." (Riva & Galimberti, 1998, p.16) The result is a concept of "fluid forms of network and community" where the individual is no longer a transmitter or receiver but "a partner in the co-construction of an area of reality" (p.16).

Gender differences in identity formation have been noted by Erikson (1968) to be based on physical uniqueness. He felt women are predisposed to a more interpersonal approach than men who tended to be more ideologically centered when constructing self-identity. Patterson, Sochting, and Marcia (cited in Cobb, 2001) found females "face a need to balance competing occupational and interpersonal commitments involving 'meta-decisions' across domains" (p. 205), whereas males can resolve these issues separately and more easily than females. Issues of relatedness and responsibility to others are prime dynamics in defining statuses for females.

An important influence on identity development is membership in social groups. Martin and Nakayama (1997) observed "Identity is created in part by the self and in part by relation to group membership" (p.64). As the individual explores interests, beliefs and abilities along internal planes, external experiences related to these preferences occur within group settings. In the CMC environment a unique form of group identity exists. A study by Postmes, Spears, and Lea (1998) indicated that visually anonymous CMC (such as chat and Instant Messenger) "enhances the group dimensions of identity," because influences from the group "come partly from within." They are "external and internal dimensions of the self" (p.13).

Trajfel (1978) discussed the importance of the categorization of social groups. In his view these groups create a *social environment* with cognitive and behavioral practices impacting identity formation. In a study concerned with the relationship between contexts created by a virtual community and the identities used by the participants (Talamo & Ligorio, 2001), it is seen that identity construction in cyberspace is directly related to the interactions in the virtual environment. In addition, the combination of text-based and visual communication (i.e. Avatars, a photo or animation

representing the user) impacted individual identities in ways that may not occur if either media were not present. The study showed that identity is not a static condition of participants, but a negotiation through discourse in interaction dependent on context and roles played. In addition, the study noted that the dialogical discourse is not used as a means of describing identity, but of constructing it. Avatars did not have the effect of representing their identities as much as they allowed positioning of those identities.

Gergen (2000) pointed to the effect of *polyvocality* or the proliferation of online opinions and commercial resources that can cause a sense of being overwhelmed in those exposed to them. He believed this effect and others embedded in the proliferation of technology are disseminating our core understandings of the self. Another contributor to this break down may be the effect of speed.

Since humans exist in time, technology can often move faster than our ability to reflect on it. When the user is fully immersed in the technological environment, the tendency towards mindful assessment of CMC diminishes. Because texts are speedily posted to unseen receivers there is a marked tendency in senders not to reflect on the message content. Speed is part of the fun of IRC and yet it imposes a specific restriction on our need for self-reflection, an influential component in decision making.

Group membership contributes knowledge that formulates a *social identity*. Group membership is maintained and new memberships are sought as long as they contribute to the positive aspects of the individual's social identity. It also enhances the need to belong, an innate human motivation (Brewer & Gardner, 1996). The activity of the social identity moves away from perception of self as a unique person and toward a depersonalized or collective sense of self. In CMC such as role playing games, where participants are motivated to move beyond accepted identity boundaries, Postmes, Spears, and Lea (1998) found they will "redraw the boundaries for groups as well as individuals" (p. 19).

As the individual perspective leans toward an in-group/out group mentality, the goals of social interactions also change. The collective identity can influence identity development independent of personal developing profiles. The space a collective occupies is a social space or community where members hold a shared interest or goal.

Adams and Ryan (2000) assessed the impact of family and university environments on identity formation and ego strength. Students answered surveys in a cohort-sequential study to examine the following four dimensions:

Avoidance decision-making is a cognitive strategy of avoiding decisions or remaining highly diffused in responses to issues of the self. *Self-reflection* is a

preference to engage in dialectic-like thinking. *Identity formatio* is understood as the ratio of identity achievement (commitments) to role confusion (diffusion), and *Ego strength* is a measure of fidelity to beliefs, behaviors, causes or relationships. The results confirmed Erikson's (1968) finding that supportive academic and family environments predict ego strength. Students who acted with minimum diffused decision making had supportive family backgrounds and perceived college and teachers as supportive. The same students showed a gain in the ego strength over the two-year span. Adams and Ryan's (2000) findings on the effect and use of self-reflection show "the role of social cognition as a mediator of academic environments" (p. 15). Students in the study who used self-reflection in a supportive environment were likely to be identity achieved within the first year.

Adams and Ryan further stated three characteristics of all social environments: first, the environment maintains relational characteristics that outline the degree to which individuals in the environment interact with each other. Second, the environment encourages psychological functioning. Third, all social environments provide order, compliance, and protocol to behavior. They noted that the first and third characteristics could have their effects through both direct and mediated social processes. The strongest findings of the study suggested that when the environment pursued a focus such as increasing scholarship skills it reduced the use of avoidance strategies in students. Briefly, "the academic environment influences social cognitions and identity formation and the family remains influential, even when that system is less dominant in the lives of youth" (p.15-16).

Adams and Ryan (2000) found support for Erikson's notion that "identity formation, when achieved, enhances one's sense of fidelity and pursuit of commitments; but when identity is diffused it lowers, or decreases fidelity, a vital virtue of personality" (p. 15). Evidence of direct and indirect influences on identity development from environments suggests that other relational systems may also impact identity formation.

An aspect of cultural identity as outlined by Collier (2003) is "a group communication system that merges when people claim membership in a particular situation, event or communication context" (p.419). Because culture can be defined in a variety of contexts including politics, ideology, psychology, worldview, style of thinking, speaking and group identity, there is no doubt that through the use of the Internet, where each of these contexts exist, many cultures can be formed. As youth of the 21st century claim the realm of the Internet as the communication device of choice, each of these contexts are thriving in the form of electronic text and simulated reality.

Much of virtual reality CMC is gaming. Online games often involve strategies with role playing and many participants are children. Publishers of GamePro Magazine (2003) state that 61% of their audience is between the ages of 12 and 18. That translates into 1.9 million young video gamers. The main use of computers by the young is still chat.

Children's Market Research report that the Internet priorities for kids 12 to 17 finds more than 70% are using the New for email, half are sending Instant Messages, and almost 40% frequent public chat rooms. It's likely those CMCs are concerned with interpersonal issues. Allison and Schultz (2001) looked at interpersonal identity development in adolescents using four domains that teens usually talk about online: dating, sex roles, friendship and recreation.

In CMC experiences boundaries often blur. Is there much separation between the play involved in formal games and the playful attitudes of online relationship that it can accommodate? Turkle (1995) noted that in virtual reality "words are deeds" (p.15). Her research (cited in Bagnall, 2000) with young Internet users showed that children are "fluent users not fluent thinkers." This means, according to Turkle, they take the computer as they find it. If it works well for them, "it has all the reality it needs." Turkle called this "the culture of simulation," (p.28) or an immersion in the computer world.

The Net Generation (N-Gen) or youth who currently use the Internet have characteristics in common (Dorman, 2000). Most exhibit fierce independence, emotional and intellectual openness, inclusion, free expression and strong views, innovation, preoccupation with maturity, investigation, sensitivity to corporate involvement, authentication, trust and immediacy. Self-reflection and identity formation can be enhanced by emotional and intellectual openness when the N-generation finds it easy to expose inner thoughts and personal information on creative web pages. Dorman's (2000) positive view of Internet wielding adolescents is offset by the postmodern perspective outlined by Gergen (2000). He saw the technological ethos as directly and indirectly undermining a belief in the self "as a bounded and integral agent, capable of conscious self-direction and self-control" (p.202). If adolescents are at such risk due to computer mediated experiences it would certainly impact their ability to construct identity statuses regarded as functioning or achieved.

Traditional psychology understands adolescent identity development based on offline criteria while today's youth are regularly interacting with complex cognitive experiences through CMC. Therefore it is important to explore this line of research. Based on the literature review, a research question was proposed:

What is the impact of Internet use on self-identity development in adolescents.

Method

Participants

Adolescent students who use the Internet regularly were the participants of this study. Among them, five

were female and five were male. Their age ranged from 12 to 18 years with the average being 14.4. Each student was an active user of the IRC on AOL's Instant Messenger (IM) for an average of two years. Use of other multi-user domains (MUDs) by participants was included as secondary sources of inquiry. Volunteer students were drawn from public and private elementary and secondary schools in the New England area. Table 1 shows the demographic information of participants.

Table 1. The Demographic Information of Participants.

| Student # | Gender | Age | Yrs of Using Internet |
|-----------|--------|-----|-----------------------|
| S1 | F | 13 | 2 |
| S2 | M | 13 | 3 |
| S3 | M | 12 | 2.5 |
| S4 | F | 14 | 1.5 |
| S5 | F | 15 | 3.5 |
| S6 | M | 13 | 1.5 |
| S7 | F | 13 | 1 |
| S8 | M | 16 | 5 |
| S9 | M | 18 | 6 |
| S10 | F | 17 | 5 |

Procedure

Structured in-depth interviews were conducted in this study to collect the information. All interviews were recorded upon the agreement of participants and the schools. School Administrators signed consent forms to conduct the interviews after the researcher presented a verbal proposal. The project was then introduced to students in grades applicable to the study. Consent forms went home with those interested for signatures from participants and the parents of minors. Each interview ranged from 45 to 74 minutes with an average length of 58 minutes.

Instrumentation

Internet usage and self-identity development were explored in this study. A modified version of questions by Adams and Ryan (2000) that operationalizes the identity dimensions of avoidance decision making, identity formation, self-reflection, and ego strength or fidelity was used. Students were asked to reference their answers to behaviors that occurred while online. For example, self-reflection as understood by Adams and Ryan (2000) is based on "a dialectic tension" (p.7) when individuals compare alternative choices for behaviors. Using this understanding, students were asked about their expression of emotions and conflict resolution while online. The degree to which self-reflection is

reported in this context with regard to their Internet usage indicates the degree of impact on that dimension.

Analysis

Ten interview cassette tapes were reviewed and transcribed into category lists representing each of the four identity dimensions. Results were analyzed by the overall range of Internet usage impact on these dimensions indicated by the responses from each student.

Results

Results from the in-depth interviews on the dimensions of avoidance decision making, self-reflection, identity formation and ego strength, showed Internet usage had a full range of impact in the majority of the students studied. This indicates that online communication as an individual experience and as a network of shared group membership is salient in the identity development of these adolescents. The following parts report the results from each dimension.

Avoidance Decision Making

Adams and Ryan (2000) used Berzonsky's (1989) measurements of diffuse/avoidance decision making styles to look at cognitive strategies of avoiding decisions or remaining highly diffused in responses to

issues of the self. Students in this study were asked about their emotions and sense of personal empowerment during CMC as well as their response to online situations involving decisions and conflict resolution.

Emotions are an area of high sensitivity during adolescence and often involved in decision making. Results show Internet usage impacted student's avoidance of decisions by offering them technological ways to communicate their decision strategies. For example, most students did not feel their online behavior choices were a conscious decision although they could clearly state what actions they took in response to conflict situations in chat or gaming. It was also clear during the interview process students hadn't thought about their online behaviors as actions but as unconscious *reaction*. Their response to negative circumstances online resulted in action to block, warn others or quit games. All students expressed a strong desire to avoid fighting or arguing in IM and gaming.

All ten students indicated they felt CMC limited their ability to express emotion. Several said CMC negated their awareness of feeling any emotion. Yet students admitted an overall positive mindset online because CMC brought them in touch with friends. When asked how they chose to respond to conflicts most students had a plan they could coherently express such as this one from S9:

In chat, arguments are menial to me. Pointless, stupid. I tell my friends I'm not going to talk online about it. I'll talk over the phone where I can hear them or in person.

When conflicts occur in anonymous CMC, S3 also responded with certainty about his plan of action:

It was a strategy game and a player got 500,000 points so they beat everyone else. Someone asked him if he was cheating and he said yeah, he had a cheat code. He won very quickly. It was just discovered; not dealt with. I never went back to that game.

When asked if users felt powerful while online, responses were uncertain or indicated no. Only one (S2) answered yes. Although he described his online behaviors as often confusing to himself, he said he felt powerful using the Net because it gave him a sense of independence. He admitted he frequently used the Internet at home without permission:

I feel more interactive than regular life. You can talk more on the Internet because there aren't other people around. More privacy online.

Some respondents (both male and female) said they felt pressured when trying to type thoughts quickly and accurately in chat. They said it caused a sense of inner confusion and frustration as S6 pointed out:

Sometimes I feel jumbled inside. Hyper. If there's a fight, like with my friends once, it was two on

two...I started saying that I'd do things, but you forget what you're saying because you're so energized. You just type away. And it's hard to forgive online. You can't see what they're feeling.

Identity Formation

Identity formation was operationalized as the degree to which a subject experiences the search to find oneself. This is evident in the ratio of identity achievement to role confusion. This study found Internet usage impacted identity formation in three ways: increased risk taking, enhancement of communication when constructing personal views, and perceptions of influence on plans for a future role.

The Internet usage by students in this study impacted the dimension of identity achievement by allowing them to take risks when they engaged in CMC with strangers. For some, this experience permitted their sense of an achieved identity to find support. Students with more diffused identities said the same experience seemed somewhat threatening. For example (S8),

Yes, I talk anonymously on Web Wizard. I have a certain level of trust that I give them even though they're anonymous. If we can't be truthful with each other why are we talking? If I suspect I can't trust someone, I'm out.

Students were asked how they constructed their own point of view on CMC. Two didn't know, three said no differently than offline, half reported the Internet enhanced their ability to be creative, meaningful and at ease when communicating. For more experienced users, access to video cameras and scanners permitted more detailed messaging and thus enhanced the quality of expression. Being concise and confident is characteristic of achieved identities. Female students and older, more computer experienced males showed a level of technological prowess that they said made them feel comfortable with the type of communicating they did online. As S7 indicated,

I try to present the reasons why I think one way as opposed to another. If there's a difference of opinion between two friends, I try not to get involved. But if I do, I'll tell each of them how I think.

Answers to question 16 indicated the degree in which communication in MUDs had an impact on students' plans for a future role. Only S10 said there was no impact. Her identity status was admittedly diffused: "I don't know who I am yet. I'm only 17. But people (in MUDs) don't influence me."

Self-reflection

This component was conceptualized as the ability to investigate the truth about opinions, especially those involving the self. Self-reflection is impacted by the Internet usage of these students in three ways: students

clearly stated why they were motivated to use IM; how it felt to be in the online environment; and how they perceived their level of openness toward opposing views online. Students' comments about online behaviors were astute. They seemed pleased with their technical prowess and were generally eager to talk about it. It was evident that little if any self-reflection on this subject had occurred prior to the interview process.

Interview questions examined why students used the Net, what it felt like to be online, and the quality of their openness to others while online. How we see our environment often reflects how we see ourselves (Postmes, Spears, & Lea, 1998). As S8 mentions,

You're alone but you don't feel alone. You go in solo. You leave solo. If I'm talking to someone about relationships and I can't have one right now - for some reason talking about that online makes me feel lonely.

Students said their reasons for logging on included doing homework, talking with friends and having fun playing games. S7 said initially she wasn't self-motivated to use the Net, it was a social response:

I used it because friends were on more. I didn't find it interesting at first but everybody was using it so I figured I'd learn. It was convenient. Then I didn't have to call them.

Contact with people in MUDs or IM gave adolescents significant exposure to a volume of opinions. CMC impacted the ability of these students to self-reflect when they were mindful of receiving messages that offered them the opportunity to do so. Often, depending on the emotional state of the user, IM exchanges were viewed as mostly shallow conversation. Yet the following comment indicates that interpersonal exchanges online have a depth that affects what adolescents think and feel about themselves on a subconscious level.

S5 indicated a specific degree of self-reflection when she remembered an online chat she had with friends about the issue of dating versus going out socially with groups:

I stay open (to other opinions). Sometimes it reveals that down deep I really want a one on one relationship. So I guess what people say really does change how I feel.

Both emotions and self-reflection are evident in the following comment by S1. She admitted feeling suspicious when kids "got too nosy" in her chat room. She reacted by warning or blocking them. She then reasoned she needed more self-control because reacting to emotions had consequences. Her understanding also confirms Martin and Nakayama's (1997) finding that the individual relies on the group to find out about the self.

If you just warn someone then everyone's mad at each other and no one's sorry. Warning can be a

protection but then you don't get to read what's really on their mind which might include an apology and the opportunity for you to apologize.

Ego Strength

Ego strength results in a fidelity to personal commitments involving beliefs, behaviors, causes or relationships. Interview questions in this category asked students to rate the depth of their commitments to others online and to themselves. An increased level of commitment indicates an increase of ego strength (Erikson, 1968). The purpose of most Internet usage is for interpersonal communication and for adolescents it concerns topics concerned with relationships (Allison & Schultz, 2001; McKenna & Bargh, 1998). S3 indicated the effect of this type of chat: "Because we're not doing anything like shooting baskets, we talk more, and it can make us closer."

The overall opinion of the students interviewed concerning the effect of Internet usage on their commitments to self and others seemed like an alien concept. Students used IM for relating, hanging out in cyberspace and keeping in touch with friends. The Net was understood by these students as an extension of their offline relations, not one that is taken as seriously as face to face contacts. The Internet either served a relational purpose well or it fell short. It was not relied on to succeed at any cost. The attitude toward the issue of how the Internet aided students in committing to relationships seemed to fluctuate between two ideas; it was viewed more as a tool if it concerned areas of future roles and more of a toy if usage concerned relationships with known friends. Adolescent responses indicate the Internet's environmental effects of deindividuation and anonymity positively impacted their fidelity to self-commitments as in this response from S7:

I do (stand up for my beliefs). I might find this easier to do online because I don't have everybody watching me. I guess it's easier because it's not on a personal level. You don't have all the pressure on you that you would if you did it face to face.

Discussion

The results of this study not only showed that Internet usage impacts four dimensions of identity development, but new ways of understanding identity formation have also been observed. Internet usage was conceptualized as the perceived experiences in the cyberspace environment, and identity development was understood as the degree of commitment to a specific conception of self (Erikson, 1968). This study interviewed adolescents about their Internet usage to discover its impact on their developing self-identity.

The age of the students involved in this study was relevant to their active involvement in the identity

formation stage of human development. Each student reported daily use of IM or other forms of CMC. The amount of time students engaged in Internet use corresponded to the level of computer immersion, indicated by Turkle (2001), evident in their confidence and ease in performing technical functions. This prowess was a source of individual pride and achievement contributing to a positive sense of self-esteem.

Since the Internet is a conglomeration of easily manipulated relationships and information not bound by real time constraints, it can often lack continuity. Erikson (1965, 1968) has underscored the importance of continuity as an internal and external factor that builds up ego strength needed for achieved identities. Ego strength produces a fidelity or inner conviction and surety about one's direction in life. When students were asked to consider their decision-making practices online they could not report any specific incidences at first. This indicates students understand the IM environment as a text messaging a situation where attitudes and behaviors associated with decision making aren't considered. The text itself was speaker and doer of the actions. Yet when asked about their choice of action in conflict situations, students were clear about their reasoning to perform as they did. This indicates an ability to self-direct and motivate individual behavior responses in a mediated setting.

These students appeared comfortable with complex CMC involving ideological conflict, anonymity, speed and misunderstandings as well as highly charged emotional responses to online behaviors such as cheating in games. For them, the Internet environment is an extension of RL experiences confirming Turkle's (2001) understanding that the Net is as real (as opposed to virtual), because the people met there are real. Apparently the same holds true when situations are negative. Students in this study reacted to negative CMC with genuine frustration indicating that online experiences held a validity offline. Since this is the case our understanding of the self is indeed changing through its contact with Internet effects as Gergen (2000) pointed out, but are these influences undermining our current beliefs about self-concepts or expanding them?

Effects of speed during IRC and offline familiarity with group members gave participants the impression that most of their CMC was friendly banter. Yet a closer examination of CMC involving conflict showed that specific behavioral decisions made online brought about satisfying resolutions for the individual who exercised them. In most cases, students showed a patterned response to first ignore the conflict, then minimize it and finally to abandon it.

Older students acted more swiftly to end their involvement by communicating their rejection or immediate withdrawal. This applied to any forum -

game, chat or IM. If the problem was significant to the adolescent, offline help was sought from teachers, parents or peers.

In general, females exhibited more concern with conflicts online confirming their stake in issues of relatedness (Patterson, Sochting, & Marica, cited in Cobb, 2001). This concern, when urgent, enabled students to seek offline support. When they did, a deeper sense of satisfaction with the conflict resolution ensued. This implies a sense of continuity in offline/online relationships was maintained. Most often however, when students were exposed to offensive CMC that threatened to persist, they used the technology itself to act as arbiter and blocked the offending party or left the site. Overall, students saw the online environment, when it was shared with offline friends, as a place to enjoy relationships unfettered by serious concerns. Students' daily use was motivated by the sense of companionship they found in online groups (Trajfel, 1978), and by the creativity experienced when they could express individual character traits through stylized web pages (Waterman, 1992).

A strict adherence to a nonchalant attitude during CMC with peers was a strong effect of deindividuation observed. This appeared similar with offline attitudes of wanting to appear "cool" among members of peer groups. When students described their experience of IM as "a place to hang out" more than a type of communication, it indicated a detached mindlessness toward the text exchange (Langer & Moldoveanu, 2000).

Most adolescents said they were not aware of any specific emotion during routine CMC. Yet CMC experiences with friends, no matter what the content of their messages, were described as fun, invigorating and always busy. This indicates a sense of intimacy one can feel with the computer itself (Robson & Robson, 1998). Contradictions in self reports like this one may be an effect of telepresence in young Internet users (Riva & Galimberti, 1998). This study found that students were unconsciously integrating opposed perceptions in response to an innate need for continuity of experience.

Decisions having a positive or ego strengthening outcome help to create a sense of continuity. When decision making results in balanced growth, self-reflection has usually been a part of the process. Since the nature of reflection is a return to something felt or thought, the exercise of self-reflection calls for an individual to be able to cognitively return to events and attitudes in order to reassess them. This occurs most easily through self-questioning. This study found that the speed of CMC and the user's emotions during it were related to the quality of self-reflection they experienced. For example IRC would generate less self-reflection than email. IRC, with its options to block, warn and speed through dialog did not seem to create scenarios that students felt worthy of self-reflection.

Yet the interview method brought out many anecdotes about effects of chats on students' emotional and social growth. Gergen (2000) wrote that Internet users will become susceptible to the polyvocality of online groups where "concern with the inner life is a luxury if not a waste a time" (p. 207). It was evident these students were not previously aware of how dynamically Internet use had effected their ideas about themselves and others. The interview process allowed students to self-reflect possibly for the first time on these subjects. They expressed enthusiasm and surprise at what they were able to understand about themselves in their responses.

The continuity so important to a healthy identity formation and already known to be lacking in the online environment surfaced in this study in hints of dualism some adolescents admitted experiencing. S6 said there was an understanding, "an online thing" that discussions from the Net weren't repeated offline. S2 responded similarly saying that the two worlds "would never meet." The majority however said they saw little difference in their relationships with friends in cyberspace or the cafeteria.

From either end of the spectrum adolescents in this study seemed comfortable with their online life and how it fit with their offline perceptions of reality. This implies Internet users themselves will become a bridge to span the continuity gap that exists between keyboard and RL. How that user fares is an outcome predicted by Gergen (2000) in one direction and Erikson (1968) in another. Erikson (1968) believed the individual seeking an achieved identity would need to successfully commit to one's relationship to "an all inclusive human identity" that he felt "must be part of the anticipation of a universal technology" (p.42). Future studies can examine how we are working out this task.

This study was limited in several aspects. The vibrant nature of the Internet and the young age of its newest users made the interview method challenging to execute and analyze. There were operational difficulties in the creation of interview questions. The interview examined complex identity dimensions and often needed supplemental questions to help students understand what was being asked.

The ages of the students crossed a broad spectrum. This may have hindered the generalization of the findings. Some younger students had more time logged on than others their age but lacked the maturity to respond to questions about online behavior to the same degree as older adolescents.

The results of this study showed that Internet usage impacts adolescent identity development and should be regarded as a significant aspect of behavioral growth by parents, health care providers and teachers. Erikson (1964) saw identity development as an ongoing process that could change direction at any point in the life cycle.

An important avenue for future research would be a longitudinal study. Because of differences in online perceptions by students from different age categories in the present study, it would be logical to assume an in-depth study over time would yield pertinent results. A triangulation process would be the optimum exploration of identity development on the Net. A likert scale could be administered as a priming device to gain younger user's perceptions of online behavior and the interview would follow.

This study found that adolescents were not aware of decision-making practices during online interactions. As the Internet accelerates its performance to include sound or "voice," an exploration of its impact on self-reflection and the user's emotions would be warranted due to the influence decision-making has on commitment and fidelity.

Finally, Adams and Ryan (2000) found that students entering college from supportive family backgrounds were often identity achieved within the first year. In this study, S2 said his unmonitored relationships with friends online were often as confusing to him as his relationships offline. Future research comparing adolescent offline support systems with their perceptions of support with experiences online, to look for impact on their identity status, should also be worthwhile.

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