CURRENT RESEARCH IN SOCIAL PSYCHOLOGY

Volume 8, Number 1
Submitted: August 22, 2002
First Revision: September 4, 2002
Accepted: September 5, 2002
Publication date: September 5,2002

INTERNET USE AND THE SELF CONCEPT: LINKING SPECIFIC USES TO GLOBAL SELF-ESTEEM

David E. Rohall

University of New Hampshire

Shelia R. Cotten

Charlie Morgan

University of Maryland Baltimore County

ABSTRACT

An Internet survey of a random sample of college freshmen at a mid-sized university in the mid-Atlantic was conducted during the spring of 2002 to determine the impact of Internet activities on self-esteem. We argue that Internet use can serve as a source of positive social support or reduce the effects of social support, thus having a negative impact on self-esteem, depending on how the Internet is used. Results partially support this perspective. More use of the Internet for non-communicative reasons (e.g., surfing) is associated with lower self-esteem, even after controlling for background characteristics. In addition, social support levels help mediate the impact of Internet use on self-esteem but these findings are less robust. These findings are discussed in terms of self-esteem research and the social impacts of technology.

[1]
---
[2]

INTRODUCTION

Internet usage among college students is increasing in the United States (Perry, Perry, Hosack-Curlin 1998), particularly among college freshmen (ACENEWS 1999). Five years ago it was estimated that 92% of U.S. college students had computer access (Marklein 1995). It is becoming more common for colleges to require freshmen to own or lease a computer, and of the colleges studied by Olson (2000), most college students had Ethernet connections in their dorm rooms. A recent study reports that the majority of college freshmen used a personal computer frequently during the year prior to entering college (The American Freshman 2001).

Although researchers are beginning to assess the levels of Internet usage and computer-mediated communication among college students (Morahan-Martin and Schumacher 2000; Perry, Perry, Hosack-Curlin 1998), almost no research has investigated how these factors may affect the self concept among college students. Further, very few studies have tried to assess the impacts of Internet use for the self-concept more generally. The goal of this paper is to examine the impacts of different types of Internet use on self-esteem using data from a random sample of college freshmen from a mid-sized state school in the mid-Atlantic region of the United States. Literature linking Internet use and well-being will be introduced, followed by research on self-esteem more specifically. Finally, a model linking Internet use to self-esteem via positive social interaction will be introduced.

INTERNET USAGE AMONG YOUTH

Todayís youth are increasingly becoming early adopters of Internet technology, and as such they are utilizing this resource to communicate with others, do research, and pursue entertainment. Recent research indicates that the majority of students between the ages of 12 and 17 use the Internet, with most of these students accessing the Internet primarily through home access (Lenhart, Rainie, and Lewis 2001). More than 90% of the youth in this study reported using the Internet for email and also for completing school projects; three-fourths also reported using instant messaging. Over three-fourths of these online teens say they would miss the Internet if they could no longer go online. Given that such a high percentage of youth use the Internet and would miss it if it was not available, it is not surprising that frequency of usage is high as well. Over 40% of youth aged 12-17 report going online *each day*, while another third of teens report going online a couple of times each week (Lenhart, Simon, and Graziano 2001).

For teenage youth, Internet usage has become an integral feature of their lives. It plays an important role in maintaining relationships with friends, family members, and school contacts and approximately half of online teens report that Internet communication has improved their relationships with friends (Lenhart, Rainie, and Lewis 2001). Gross, Juvonen, and Gable (2001) report that teens that already have strong social networks utilize email and instant messaging as a way to reinforce these existing connections, while those with smaller or less developed networks utilize the Internet to develop new social network ties.

[2]
---
[3]

The prior studies on youth suggest that acculturation into Internet usage begins early in the school and family socialization processes. By the time youth enter college today, they should be skilled in using the Internet. These skills are becoming the norm as it is becoming more commonplace for colleges and universities to require students to own or lease a computer when they enter school as freshmen. Similarly, Ethernet connections are commonplace at schools, even in residence hall dorm rooms (Olson 2000).

Internet usage estimates are very high among college freshmen, with close to 80% of college freshmen reporting using a personal computer frequently during the year prior to entering college (The American Freshman 2001). Other recent research indicates that almost 60% of freshmen communicated daily with friends or acquaintances outside their institution, 36% with students at their institution, and almost 27% with family members via email (Sax et al. 2000). These findings also show that only about 25% of college students communicated with faculty members once a week or more, and that only 35% reported communicating at all with their advisor via email. The results of these studies suggest that college freshmen utilize the Internet at high levels, and for a variety of reasons.

INTERNET USAGE, WELL-BEING, AND SELF-ESTEEM

Given the high levels of Internet usage among youth, it seems critical to begin examining the effects of this usage on their well-being. Unfortunately, research examining the effects of Internet use on individuals in general, and youth more specifically, is in its infancy. Further, most of the research linking the Internet to self-evaluations has focused on its effects on personal well-being. Initial studies of Internet users found that Internet usage was inversely related to

social contacts, with some researchers stating that increased use of the Internet, at least among novice users, was associated with increased social isolation and even depression (Kraut, Kiesler, Boneva, Cummings, Helgeson, and Crawford 2002; Kraut, Patterson, Lundmark, Kiesler, Mukophadhyay, and Scherlis 1998).

However, most of the current research on the effects of Internet usage on personal outcomes indicates positive effects. For example, recent studies show that computer-mediated communication tends to supplement rather than detract from traditional modes of communication (i.e., face-to-face and phone contact) (Wellman, Haase, Witte, Hampton 2001; Katz, Rice, and Aspen 2001). In addition, Internet usage has been associated with increases in voluntary activities (Wellman et al. 2001) and Internet access has been associated with increased contact with friends and relatives among people moving to a new neighborhood (Hampton and Wellman 2001).

[3]
---
[4]

The few studies of Internet use among high school and college students are not quite as positive as the literature cited earlier. It appears that extremely high levels of Internet usage may be associated with a variety of negative outcomes. For example, a study of high school seniors found that high Internet use was related to weaker social ties (Sanders, Field, Diego, and Kaplan 2000). Similarly a recent study of college students found that heavier Internet usage was highly associated with impaired academic outcomes (Kubey, Lavin, and Barrows 2001). Other research on college students, however, concluded that quantity of Internet use was not related to psychosocial adjustment (Ward 2001). Morgan and Cotten (2002) found that Internet usage for communication purposes was associated with decreased depressive symptoms, while non-communication usage was related to increased depressive symptoms among college freshmen. The results in this area are far from consistent in terms of how Internet usage relates to academic and well-being outcomes.

Theoretically, using the Internet for communication purposes allows for the development and maintenance of affective social ties. We argue that the Internet can act like any other medium; it can act as a conduit for social interaction, such as the telephone, or it can limit social interaction, such as watching television. Thus, using the Internet for communicative reasons may actually help to create and maintain social networks and exchange social support while using it for other reasons may restrict access to or use of support. This is important given the role of social support in peopleís lives. Social support helps ameliorate the negative effects of stressful life events, and thus leads to lower levels of negative psychological outcomes, particularly depressive symptoms (Pearlin 1989; Turner and Roszell 1994; Cotten 1999). Thus, Internet

usage for communication purposes, which is related to the exchange of social support, should be associated with better levels of psychological well-being.

Cotten (2001) and Preece (2000) suggest that online communication allows for the development of computer-mediated support (support that is exchanged via email, chat rooms, instant messaging) that may buffer the negative effects of stressful life circumstances, as do types of non computer-mediated social support. Prior studies show that people experiencing stressful life events receive vital support from computer-mediated communication, and particularly from online communities (Ickes 1997; Preece 2000). The benefits that computer-mediated communication and online communities provide are especially valuable for people who lack mobility, or are socially or geographically isolated (Cummings, Sproull, and Kiesler 2001; Sproull and Keisler 1986; Cotten 2001).

[4]
---
[5]

The relationship between Internet use and well-being is salient to understanding its impacts on the self-concept because elements of the self-concept like mastery and self-esteem are highly related to well-being (see Pearlin 1989). Yet, little research has been done to examine this relationship. Early research in this area generally predicted that Internet use would lead to less social interaction and thus decrease the primary means of boosting self worth (McKenna and Bargh 2000). Further, the Internet would be a form of escape for those who could not otherwise cope with their reality. Some research supported these ideas. Armstrong (2000) found that people with poorer self-esteem showed greater Internet-related problems (i.e., addiction). Funk and Buchman (1996) found electronic game playing was associated with lower self-esteem among females. However, Shaw and Grant (2002) found an increase in both social support and self-esteem when they followed a group of chat-room participants over a period of time.

These findings suggest that the effect of Internet use on self-esteem may depend on its use: using the Internet to relate to others may boost self-esteem by providing access to positive interaction while using it to escape from social reality may create self-esteem problems by limiting such interaction or simply reflecting underlying problems. The communicative function is particularly important to understanding the Internetís effects on the self-concept, since social interaction provides a means of constructing the self-concept (Rosenberg1986). Patterns of positive interaction help to boost our self images while negative interactions reduce them.

Most research suggests that youth are using the Internet to communicate with friends (in particular), but also with family members. In a pilot study of Internet users by Cotten and her

colleagues (2002), they found that college students reported using the Internet to communicate primarily with geographically distant network ties, of which the majority was family and friends. Although it is known that college students communicate with a variety of individuals online, research suggests that most interaction is with existing network ties. Thus, theoretically, it makes sense that Internet usage for communication purposes would be associated with perceptions of social support among family and friends.

Several studies have established a link between positive social relationships, in the form of social support, and self-esteem (see Newcomb and Keefe 1997). Makri-Botsari (2001) reports that among high-school students who report high levels of acceptance by teachers and parents, the students who feel that their acceptance is unconditional report higher levels of self-esteem than those who feel that their acceptance is conditional. In a sample of visually-impaired adolescents, social support from friends is shown to help boost self-esteem, particularly among those with more severe impairments (Huurre 1999). Similar findings are also found in college student samples. In studying the effects of unemployment on self-esteem among Croatian university students, Lackovic-Grgin and colleagues (1996) find social support of friends and family associated with higher self-esteem among unemployed university students.

While computer use may reflect a desire to avoid people, it may also provide a venue for some for boosting self-esteem, via positive social interaction. If the Internet gives us more freedom to choose interactions, it makes sense that we would look for the most positive feedback. Further, we can quickly eliminate less desirable interactions while increasing time and exposure to positive interactions. Thus, Internet use for communicative purposes should boost self-esteem by providing positive feedback, but at least some of these effects should come from the social support that the Internet provides. Internet use for other reasons should have a negative effect on self-esteem, either reflecting our self-concept as it is or limiting access to positive social stimulation of it.

METHODS

Data and Sample

An Internet survey of a random sample of second semester on-campus freshmen college students (n=500) at a mid-Atlantic, mid-sized public university was conducted during the spring of 2002. The survey gathered information on demographics, Internet usage levels and types, sources of social support, and measures of well-being. A pre-notice letter delivered by campus mail notified students that they had been selected to participate in the study and that they should expect an email in the next few days at their university email address with directions on how to complete the survey. Students were then sent email messages asking them to complete the survey, and providing a link to the Internet based survey. Follow-up mailings were performed with both e-mail and hard copy. Total responses equaled 287.

The overall response rate was 56% for the study. While this percent is lower than we would have preferred, it is representative of other representative student samples. For instance, a recent study by Hertel (2002) employed a mail survey using a random sample of freshmen and only found a 55% response rate, even after two follow-ups. We attempted to see if mode of administration introduced any bias by using a split-sample follow-up with half the sample receiving the e-mail survey and the other half receiving a mail version. Regardless of the mode of administration, almost all respondents reported high levels of Internet usage in general. Therefore, we suggest that the selection bias related to Internet usage is minimal in this study.

Measures

Self-Esteem: Self-esteem levels were measured using Rosenbergís (1965) self-esteem scale. Respondents were asked the degree to which they agree with the following statements: "I feel that I'm a person of worth, at least on an equal plane as others," "I feel that I have a number of good qualities," "All in all, I am inclined to think that I am a failure," "I am able to do things as well as most other people," "I feel that I do not do things as well as most other people," "I feel that I do not have much to be proud of," "I take a positive attitude toward myself," "On the whole, I am satisfied with myself," "I wish I could have more respect for myself," "I certainly feel useless," and "At times I think I am no good at all." Responses ranged from 0 "Strongly Agree" to 3 "Strongly Disagree." Items were recoded such that positive scores reflect higher self-esteem. The combined item index produced a Cronbachís alpha reliability coefficient of .91.

Internet Usage: Internet usage is divided into usage for communication and non-communication purposes. Internet communication usage is measured by asking respondents the number of hours per week using (1) email and (2) chat rooms and instant messaging. Internet non-communication

usage assesses the number of hours per week using the Internet for shopping, playing games, and doing research. Respondents entered the actual number of hours spent on each activity.

These measures were modified from those in the General Social Survey (General Social Survey 2000) to be appropriate for college students and they have been used in similar ways in other studies (see the Pew Internet & American Life studies by Lenhart and colleagues (2001)). Although measurement error may exist in that college studentsí recollections of their Internet usage amounts may vary depending upon stress and school obligations, this measurement technique is commonly used in prior studies. Future studies that can actually assess where students go on the Internet and what actually transpires when online will be able to better discern the levels of measurement error that may exist when using self-report measures.

Social Support: Social support was measured using a four-item scale (House 1989; House, Landis, and Umberson 1988): "On average, how much do your friends and relatives make you feel loved and cared for?" "On average, how much do you feel your friends and relatives make too many demands on you?" "How much are these friends and relatives willing to listen when you need to talk about your worries or problems?" and "How much are these friends and relatives critical of you or what you do?" The original scale had friends and relatives as separate questions. Due to time and survey space constraints, the two groups were combined in the current survey. Responses ranged from 1 "A Great Deal" to 5 "Not at all." Responses were coded so that higher scores reflect higher levels of social support.

[7]
---
[8]

An alpha reliability coefficient of .51 was achieved using all four items. Reliability analyses showed that the dropping the fourth item in the series increased the reliability to .54 and produced a much stronger relationship with self-esteem and other salient model variables. Therefore, the final scale only includes the first three items.

Control Variables: Gender (1=Female), age (continuous measure), and whether the respondent has declared a major (1=Yes) were available controls in this study.

Analytical Procedures

Descriptive statistics were generated to describe the characteristics of the total sample. Bivariate analysis was conducted to assess the relationships between each independent variable and the outcome measure using correlation analysis. Finally, two sets of regression analyses were conducted, one to test for the effects of Internet use on self-esteem, controlling for background characteristics, and another to test for the mediating effects of social support. Mediating effects were determined both by examining variables' ability to reduce the effects of the primary independent variable and follow-up analysis that regressed resources on the stressors. Strong effects suggest these variables act as mediators (see Baron and Kenny 1986).

RESULTS

Approximately 54% of the sample is female and over 70% of the sample has declared a major (see Table 1). The mean age is 18 years. Respondents report averaging 3.9 hours of email usage per week, but 15.6 hours of chat room and instant messaging usage. Approximately 11.1 hours per week are spent in use of the Internet for non-communication purposes. The mean self-esteem score for the sample is 22.6 (out of a possible 30 points). From this, it appears that the majority of the students report high levels of self-esteem. Students also report a relatively high level of social support (11.9 out of a possible 20 points).

[8]

---

[9]

Table 1: Sample Characteristics

Model Variables	N	Mean	Std. Deviation	Minimum	Maximum
Self-Esteem	270	22.59	5.67	2.00	30.00
Email Hours	262	3.91	8.86	.50	110.00
Chat Room Hours	254	15.57	19.51	.00	119.00
Surf Hours	254	11.07	15.65	.00	125.00

Social Support	267	11.91	2.05	5.00	15.00
Female	270	.54	.50	.00	1.00
Age	270	18.05	.50	16.00	22.00
Declared Major	270	.71	.46	.00	1.00
Valid N (listwise)	241				

Table 2 presents the correlation analysis for the study variables. While hours per week using the Internet for non-communication purposes is associated with *lower* self-esteem (r=-.18, p<.01), supporting one of our hypotheses, using the Internet for e-mail and chat rooms/ instant messaging are not significantly associated with self-esteem. Social support is associated with higher levels of self-esteem (r=.42, p<.001) and students who have declared a major report higher levels of self-esteem (r=.20, p<.001) than those who have not. It is also interesting to note that women report using the Internet less for surfing than males, while they do not vary significantly on using the Internet for e-mail or other forms of communication.

[9]
---
[10]

Table 2: Correlation of Self-Esteem and Other Model Variables

	Self-Esteem	**Email Hours**	**Chat Room Hours**	**Surf Hours**	**Social Support**	**Female**	**Age**	**Declared Major**
Self-Esteem	----							
Email Hours	.06 (270)	----						
Chat Room Hours	.02 (254)	.23*** (250)	----					
Surf Hours	-.18** (254)	.11 (250)	.55*** (246)	----				
Social Support	.42*** (267)	-.16** (263)	.13* (255)	-.01 (254)	----			

Female	.08 (270)	.06 (262)	-.06 (254)	-.16** (254)	.12* (267)	----		
Age	.01 (270)	-.07 (263)	.06 (254)	.04 (254)	.06 (267)	.08 (270)	----	
Declared Major	.20*** (271)	.06 (262)	.08 (254)	.05 (254)	.16** (267)	-.01 (270)	.01 (270)	----

* p. < .05, ** p. < .01, *** p. < .001

Correlation analyses also show that social support is positively related to one form of Internet use, chat-rooms (r=.13, p<.05), but negatively correlated e-mail use (r=-.16, p<.01). Thus, using the Internet to communicate with other people via chat-rooms is associated with a stronger sense of social support. However, using it for e-mail is associated with a lower sense of social support.

[10]
---
[11]

Regressing self-esteem on Internet use and other model variables supports the findings presented in the correlation analysis (see Table 3). The only background characteristic associated with self-esteem is choosing a major; students who have chosen a major report higher levels of self-esteem (B= .21, p<.01). Adding hours spent using the Internet for e-mail or other forms of online communication is not associated with self-esteem (see Models 2 and 3). However, using the Internet for surfing or non-communication continues to have a negative effect on self-esteem, even when controlling for background characteristics and other uses of the Internet (see Model 4) (B=-.30, p<.01). About nine percent of the variance in self-esteem is explained by socio-demographic factors and Internet usage variables, more than half of which can be attributable to hours spent surfing the web. Results in Table 3 continue to support one of our hypotheses, that using the Internet for non-communicative reasons is associated with lower self-esteem.

Table 3: Self-Esteem Regressed on Internet Use and Other Model Variables^

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Email Hours		.067 (.058)	.064 (.060)	.065 (.058)	.091 (.055)

Chat Room Hours			.010 (.019)	.165* (.022)	.090 (.021)
Surf Hours				-.289** (.026)	-.241** (.025)
Social Support					.353** (.165)
Sex (1=female)	.079 (.702)	.069 (.710)	.070 (.715)	.025 (.707)	-.002 (.663)
Age	-.028 (.689)	-.022 (.692)	-.023 (.696)	-.024 (.676)	-.149 (.712)
Declared Major (1=yes)	.213** (.766)	.210** (.766)	.209** (.770)	.212** (.749)	.149* (.712)
R^2	.040	.041	.037	.089	.204

Numbers in parentheses are standard errors.

^ OLS regression, standardized beta coefficients, N=240

* p<.05, **p<.01

[11]

---

[12]

Two analyses will be done to test for the possible mediating effects of social support on the relationship between Internet use and self-esteem. First, Table 3 (see Model 5) shows a relatively strong effect of social support on self-esteem (B=.35, p<.01). Further, including social support in the model results in a small reduction in the effect of Internet surfing on self-esteem (17% reduction in effect). It also mediates the effect of chat room usage on self-esteem, as the effect of chat room usage becomes non-significant when social support is included in the model.

Table 4 includes additional analysis to test for the mediating effects of social support on the relationship between Internet use and self-esteem. Regression analysis shows almost no effect of model variables on social support levels. Among Internet usage variables, chat-room hours are

associated with higher levels of social support, supporting our hypotheses regarding the positive effects of Internet use for communicative reasons (B=.15, p<.05) (Model 4). It also suggests that the effects of chat room hours are mediated through respondentsí perceptions of social support. However, the negative impacts of Internet usage for surfing and other reasons are minimal (B=-.13, p<.10), suggesting that that the mediating effects of social support are present but not very strong. It should also be noted that the negative relationship between e-mail use and social support in the correlation analysis (Table 2) disappears when background characteristics are controlled in the regression analyses, suggesting that e-mail use may have little or no relationship with either sense of social support or self-esteem.

Table 4: Social Support Regressed on Internet Use and Other Model Variables^

	Model 1	**Model 2**	**Model 3**	**Model 4**
Email Hours		-.035 (.021)	-.074 (.022)	-.074 (.022)
Chat Room Hours			.145** (.007)	.214*** (.008)
Surf Hours				-.128* (.010)
Sex (1=female)	.079 (.257)	.084 (.260)	.097 (.259)	.077 (.263)
Age	.055 (.252)	.051 (.253)	.039 (.252)	.039 (.251)
Declared Major (1=yes)	.185*** (.280)	.186*** (.281)	.177*** (.279)	.178** (.278)
R^2	.031	.028	.044	.051

Numbers in parentheses are standard errors.

^ OLS regression, standardized beta coefficients, N=240

*p<.10, ** p<.05, ***p<.01

DISCUSSION

The purpose of this study was to determine the effects of Internet usage on self-esteem and test for the mediating effects of social support on this relationship. We hypothesized that Internet use for communicative purposes would be positively related to self-esteem and its use for other reasons would have negative effects, largely as a result of the presence or absence of social support. Our findings support some of these hypotheses. First, self-esteem is negatively associated with time spent on the Internet for surfing or other non-communicative purposes. This makes sense: people with low self-esteem may be avoiding traditional social interaction or the lack of positive social interaction may reduce self-esteem. There is reason to believe the latter may be the case, since including social support into the model reduces some of the impact of Internet surfing on self-esteem. However, follow-up analysis shows only a small effect of Internet surfing on social support. This may be a reflection of our measure of social support. Perhaps a measure more focused on computer-mediated social support would help elaborate this relationship. Future research should try to determine the degree to which traditional support measures are useful in the Internet environment.

We also find that Internet communication may have different effects on self-esteem and support, depending on its format. While we find only a small effect of chat-room hours on self-esteem, its effects on social support are stronger. However, zero-order correlations show a *negative* relationship between e-mail use and social support. Regression analyses reveal that these effects are largely a result of background characteristics. At the least, it suggests that different forms of communication may have differing impacts on individual well-being.

These findings generally support recent literature linking Internet use and well-being more generally, and the concerns that some forms of Internet use may decrease social interaction designed to boost self worth (McKenna and Bargh 2000). Further, we find a positive effect of participating in chat-rooms and social support like Shaw and Grant (2002). These findings support the notion that the Internet may be a great source of positive interaction, particularly for people who lack mobility, or are socially or geographically isolated (Cummings et al., 2001; Cotten 2001).

We did not find strong effects of using the Internet for communicative purposes on self-esteem. But this finding may reflect the nature of the measures. While we established the quantity of communicative use, we did not establish the quality of that interaction. Perhaps some forms of communication are less powerful than others. For instance, we did find a small relationship between social support and the use of the Internet for chat rooms and other forms of communication, but this relationship was not found for e-mail. Perhaps the synchronous nature

of communication in chat rooms makes it more like traditional social interaction, making it more ìrealî to people, hence more useful for assessing our self-worth.

[13]
---
[14]

While the results of this study provide new information regarding the interrelationships among Internet usage and the self-concept, it should be kept in mind that issues of causality cannot be determined due to the cross-sectional nature of the data. It is plausible to argue that people with higher levels of self-esteem will use the Internet for different reasons than those with low levels of self-esteem. For instance, future studies may show that use of the Internet for surfing reflects a form of escape for those who have low self-esteem, rather than reducing access to social support. The only true method of establishing this relationship is to conduct longitudinal research, to predict change in self-esteem over time.

Future studies are needed that elaborate upon these relationships with larger, more diverse samples of both students and non-students, and that follow respondents to discern how these relationships may change over time and to discover other social impacts of Internet usage. In addition, more research is needed to clarify specific aspects of Internet usage and how these may influence both social support and aspects of our self-concept. We hope that this study will provide a venue for establishing such projects in the future.

REFERENCES

Higher Education Research Institute. 2000. "The Nation's Female Freshmen Lack Computer Confidence, UCLA Study Reveals." Available at: http://www.gseis.ucla.edu/~heri/norms_pr_00.html.

Higher Education Research Institute. 2000. The American Freshman: National Norms for 2000, Higher Education Research Institute, UCLA.

Armstrong, Lynette, James G. Phillips, and Lauren L. Saling. 2000. "Potential Determinants of Heavier Internet Usage." *International Journal of Human-Computer Studies*, 53(4): 537-550.

Baron, Reuben M. and David A. Kenny. 1986. "The Moderator-Mediator Variable Distinctions in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." *Journal of Personality and Social Psychology*, 51(6): 1173-1182.

Cotten, Shelia. 1999. "Marital Status and Mental Health Revisited: Examining the Importance of Risk Factors and Resources." *Family Relations*, 48:225-233.

Cotten, Shelia. 2001. "Implications of Internet Technology for Medical Sociology in the New Millennium." *Sociological Spectrum*, 21:319-340.

Cotten, Shelia, Beth Davison, and Heather Hax. 2002. "Internet Communication and Changes in Contact With Others." Paper presented at the *American Sociological Association* annual meetings, August 2002, Chicago, IL.

Cummings, J., Lee Sproull, Sara Kiesler. 2002. ìBeyond Hearing: Where Real World and Online Support Meet.î *Group Dynamics*, 6: 78-88.

Funk, Jeanne B. and Debra D. Buchman. 1996. "Playing Violent Video and Computer Games and Adolescent Self-Concept." *Journal of Communication*, 46(2): 19-32.

General Social Survey 2000. *Census Bureau.* Washington, D.C.

Gross, E., J. Juvonen, and S. Gable. 2001. *Internet Use and Well-Being in Adolescence*. Los Angeles: UCLA.

Hampton, Keith and Barry Wellman. 2001. "Long Distance Community in the Network Society." *American Behavioral Scientist*, 45:476-495.

Hertel, James B. 2002. "College Student Generational Status: Similarities, Differences, and Factors in College Adjustment." *Psychological Record*, 52(1): 3-19.

House, James S. 1989. *Americans' Changing Lives: Wave I, Computer File*, Ann Arbor, MI: Survey Research Center [producer]; Inter-University Consortium for Political and Social Research [distributor].

House, James S., Karl R. Landis, and Debra Umberson. 1988. "Social Relationships and Health.î *Science*, 241: 540-545.

Huurre, Taina Maarit, Erkki Juhani Komulainen, and Hillevi Marita Aro. 1999. ìSocial Support and Self-Esteem Among Adolescents with Visual Impairments." *Journal of Visual Impairment and Blindness*, 93(1): 26-37.

Ickes, William. 1997. *Empathic Accuracy*. New York: The Guilford Press.

Katz, James E., Ronald E. Rice, and Philip Aspden. 2001. "The Internet, 1995-2000: Access, Civic Involvement, and Social Interaction." *American Behavioral Scientist,* 45:405-419.

Kraut, Robert, Sara Kiesler, Bonka Bonev, Jonathon Cummings, Vicki Helgeson, and Anne Crawford. 2002. "Internet Paradox Revisited." *Journal of Social Issues,* 58: 49-74.

Kraut, Robert, Michael Patterson, Vicki Lundmark, Sara Kiesler, Tridas Mukophadhyay, and William Scherlis. 1996 "Internet Paradox: A Social Technology that Reduces Social Involvement and Psychological Well-Being." *American Psychologist*, 53:1017-1031.

Kubey, RobertW., Michael Lavin, and John R. Barrows. 2001. "Internet Use and Collegiate Academic Performance Decrements: Early Findings." *Journal of Communication*, 51: 366-382.

Lackovic-Grgin, Katica, Maja Dekovic, Branko Milosavljevic, Izabela Cvek-Soric, and Goran Opacic. 1996. "Social Support and Self-Esteem in Unemployed University Students." *Adolescence*, 31(123): 701-707.

Lenhart, Amanda, Lee Rainie, and Oliver Lewis. 2001. *Teenage Life Online: The Rise of the Instant-Message Generation and the Internet's Impact on Friendships and Family Relationships*. Pew Research Center. Available at: http://www.pewinternet.org/. Accessed November 20, 2001.

Lenhart, Amanda, Maya Simon, and Mike Graziano. 2001. *The Internet and Education: Findings from the Pew Internet and American Life Project*. Pew Research Center. Available at: http://www.pewinternet.org/. Accessed November 20, 2001.

Makri-Botsari, Evi. 2001. "Types of Social Support and the Role of Unconditional Acceptance in the Development of a Positive Self-Esteem." *Psychology: The Journal of the Hellenic Psychological Society*, 8(4): 488-505.

Marklein, M. 1995. "At Colleges, E-mail is as Easy as ABC." *USA Today,* 5:1D.

McKenna, Katelyn Y.A. and John A. Bargh. 2000. "Plan 9 from Cyberspace: The Implications of the Internet for Personality and Social Psychology." *Personality and Social Psychology Review*, 4(1): 57-75.

Morahan-Martin, J. and P. Schumacher. 2000. "Incidence and Correlates of Pathological Internet Use Among College Students." *Computers in Human Behavior,* 16:13-29.

Newcomb, Michael D. and Keunho Keefe. 1997. "Social Support, Self-Esteem, Social Conformity, and Gregariousness: Developmental Patterns Across 12 years." *Sourcebook of Social Support and Personality*: 303-333.

Olson, F. 2000. "Campus Newcomers Arrive with More Skill, Better Gear: A Look at Freshmen Computing Lifestyles at 5 Institutions." *Chronicle of Higher Education,* 47:A39-40.

Pearlin, Leonard I. 1989. "The Sociological Study of Stress." *Journal of Health and Social Behavior,* 30: 241-256.

Perry, T.T., L.A. Perry, and K. Hosack-Curlin. 1998. "Internet Use by University Students: An Interdisciplinary Study on Three Campuses." *Internet Research: Electronic Networking Applications and Policy,* 8:136-141.

Preece, Jenny. 2000. *Online Communities: Designing Usability, Supporting Sociability.* Chichester, UK: John Wiley and Sons.

Sanders, Christopher E., Tiffany M. Field, Miguel Diego, and Michelle Kaplan. 2000. "The Relationship of Internet Use to Depression and Social Isolation Among Adolescents." *Adolescence,* 35:237-239.

Sax, Linda J., Shannon K. Gilmartin, Jennifer R. Keup, Frank A. DiCristi, and Alyssa N. Bryant. 2000. "Designing an Assessment of the First College Year: Results from the 1999-2000 YFCY Pilot Study." *Los Angeles: Higher Education Research Institute, UCLA 2000.* Available at: http://www.gseis.ucla.edu/heri/heri.html

. Accessed: April 16, 2001.

Shaw, L. H. and L.M. Gant. 2002. "In Defense of the Internet: The Relationship Between Internet Communication and Depression, Loneliness, Self-Esteem, and Perceived Social Support." *CyberPsychology,* 5(2):157-171.

Sproull, Lee S. and Sara Keisler. 1986. "Reducing Social Context Cues: Electronic Mail in Organizational Communication." *Management Science,* 32:1492-1512.

Turner, R. Jay and Patricia Roszell. 1994. "Psychosocial Resources and the Stress Process." In: Avison W, Gotlib I, eds. *Stress and Mental Health: Contemporary Issues and Prospects for the Future.* New York: Plenum Press.

Ward, D.L. 2001. *The Relationship Between Psychosocial Adjustment, Identity Formation, and Problematic Internet Use.* Dissertation Abstracts International: Section B: The Sciences and Engineering 2001; 61:3906.

Wellman, Barry, Anabel Q. Haase, James Witte, and Keith Hampton. 2001. "Does the Internet Increase, Decrease, or Supplement Social Capital?" *American Behavioral Scientist,* 45:436-455.

[17]

---

[18]

AUTHORS' BIOGRAPHIES

David Rohall is an Assistant Professor of Sociology at the University of New Hampshire. His research focuses on the effects of social structure on personality and well-being. Current research examines the impact of geographic distance on one's sense of self as well as the mediating effects of the self-concept on the effects of stressful life events on mental health. Please refer all comments and questions regarding this paper to David E. Rohall, Department of Sociology, University of New Hampshire, Durham, NH 03824 or via e-mail at david.rohall@unh.edu.

Shelia R. Cotten is an Assistant Professor of Sociology at the University of Maryland Baltimore County. Her research examines the interrelationships among social structure, psychosocial resources, and health status. Her current research focuses on the social impacts of Internet usage, in particular in relation to computer-mediated social support and health status. She can be contacted at the University of Maryland Baltimore County, Department of Sociology, 1000 Hilltop Circle, Baltimore, Maryland 21250 or via email at cotten@umbc.edu.

Charlie Morgan is a doctoral student in the Policy Sciences Ph.D. program at the University of Maryland Baltimore County. His dissertation research examines formulary committee decision-making processes in the health care arena. His email address is: cmorga2@umbc.edu.