

Involvement in Internet Aggression During Early Adolescence

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Abstract The current study examined concurrent and longitudinal predictors of early adolescents' involvement in Internet aggression. Cross-sectional results ($N = 330$; 57% female) showed that the likelihood of reporting Internet aggression was higher among youth who spent more time using Internet-based technologies to communicate with friends and who were themselves targets of Internet aggression. Offline relational aggression and beliefs supportive of relational and physical aggression also predicted concurrent involvement in Internet aggression. We used longitudinal data ($N = 150$; 51% female) to distinguish between youth who were aggressive in traditional contexts only (i.e., school) from those who were aggressive both online and offline. These results indicated that youth who were aggressive both online and offline were older at the initial assessment, were targets of Internet aggression, and held beliefs more supportive of relational aggression than youth who were aggressive offline only. Implications and directions for future research are discussed.

Keywords Internet · Aggression ·
Social information processing

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Introduction

Attention to the role of the Internet and other forms of electronic media on child and adolescent development has increased dramatically in recent years (David-Ferdon and Hertz 2007; Greenfield and Yan 2006; Lenhart et al. 2001; Wartella et al. 2004). This is not surprising in light of estimates indicating that more than 90% of youth between the ages of 12 and 18 are Internet users (Macgill 2007), and that 52% of adolescent Internet users go online at least once a day (Lenhart et al. 2005). To date, much of this attention has focused on describing trends in youth Internet use, exploring the functions of new forms of electronic media for youth, and examining the characteristics of Internet users (e.g., Gross 2004; Subrahmanyam et al. 2001). In addition, researchers have paid increasing attention to the implications of Internet use for adolescent social adjustment (e.g., Gross et al. 2002; Valkenburg and Peter 2007).

One particular topic of interest to professionals across diverse fields of study has been Internet aggression. Although definitions vary across studies, at the broadest level Internet aggression includes “overt, intentional acts of aggression toward others online” (Ybarra and Mitchell 2004a, p. 1,308). Research to date indicates that a small but significant minority of adolescent Internet users are involved in Internet aggression, with some reporting negative consequences of their experiences online (Li 2006; Patchin and Hinduja 2006; Wolak et al. 2007; Ybarra and Mitchell 2004a, b). Because only a few empirical studies have been conducted thus far, our understanding of this phenomenon is still in its infancy. The current study was designed to increase knowledge about factors associated with Internet aggression during early adolescence, particularly those that distinguish youth who are aggressive

online and offline from those who are aggressive offline only.

Trends in Adolescent Internet Use and Computer-Mediated Communication

Adolescents are using the Internet for diverse purposes including education, shopping, and gaming, however social communication has become the primary function of Internet use among youth (Gross 2004). Currently, a wide variety of Internet-based tools are available for computer-mediated communication (CMC): email, instant messaging (IM), text messaging on cellular phones, chat rooms, web logs (blogs), and social networking sites, such as Myspace. According to a report from the Pew Internet and American Life Project (Lenhart et al. 2005), 89% of adolescents surveyed used email, 75% used IM (48% of whom reported exchanging IMs every day), and 33% used cell phones to send text messages. A more recent Pew survey found that 55% of adolescent Internet users visit social networking sites, 26% of whom do so on a daily basis (Lenhart and Madden 2007). The same survey reported that older females utilize social communication Internet technologies to a greater degree than do males, although this gap may be decreasing. The majority of online communications appear to take place between youth and their offline friends and family, rather than with strangers (Gross 2004; Valkenburg and Peter 2007). Clearly, the Internet has created a new and highly complex social environment for youth.

Internet Aggression

Although the majority of adolescents' online social interactions are likely pleasurable, recent evidence suggests that a significant minority of youth are involved in negative interactions, either as the perpetrator, target, or both. Referred to as Internet aggression, Internet harassment or cyberbullying, definitions of this phenomenon have varied across studies. Specific behaviors include rude, embarrassing, threatening or harassing comments; unwanted sexual comments; and exclusion [e.g., blocking someone from a buddy list] (Finkelhor et al. 2000; Patchin and Hinduja 2006; Ybarra and Mitchell 2004a, b). Using data from the Youth Internet Safety Study (YISS) of 1,501 Internet users between the ages of 11 and 17, Ybarra and Mitchell (2004a) reported that 15% engaged in acts of Internet aggression in the previous year. Similar estimates of 11% were reported by Patchin and Hinduja (2006) in an online survey completed by 384 youth aged 18 and under; and by Kowalski and Limber (2007), who surveyed more than 3,000 middle school students. These rates are similar to national estimates of the prevalence of traditional, or offline, bullying in U.S. schools. For example, Nansel et al.

(2001) found that 13% of 6th through 10th graders reported bullying others at school. Higher estimates have been reported for specific acts of Internet aggression. For example, a recent Pew survey found that 82% of IM-using teens reported blocking someone, although 52% indicated that they engaged in this behavior less than every few months (Lenhart et al. 2005). When youth have been asked whether they have been the *targets* of Internet aggression, prevalence estimates have ranged from 6 (Finkelhor et al. 2000) to 43% (Patchin and Hinduja 2006). These discrepant results are likely due to the varied sampling techniques, operational definitions, and data collection methods used in prior studies on this topic.

The anonymous nature of the Internet is commonly cited as an explanation of its attractiveness as a vehicle of harm in online interactions. Social psychologists have argued that anonymity operates to reduce an individual's self-awareness resulting in *deindividuation* (Diener 1980; Zimbardo 1970). Deindividuated persons are presumed to have difficulty regulating their behavior, an outcome that is likely exacerbated by concomitant lower levels of concern about others' evaluation (Zimbardo 1970). A related concern is the absence of contextual cues in online social interactions that serve important regulatory functions, such as posture, facial expression, and tone of voice (Sproull and Kiesler 1986). Not only can their absence result in more self- rather than other-centered behavior on the part of senders, but receivers also run the risk of making attributional and other perceptual errors when interpreting others' communication devoid of nonverbal cues. In support of these hypotheses, several studies report higher levels of interpersonal misunderstanding, hostility and aggression, and nonconforming behavior in adults' online interactions relative to face-to-face interactions (see McKenna and Bargh 2000, for a review).

Consideration of other features of CMC and the use of multimedia technology might shed further light on the phenomenon of Internet aggression. For example, chat rooms and social networking sites such as Myspace allow youth to harass and humiliate peers in public settings. In addition, the text-based nature of email and IM present opportunities for aggressors to gather and distribute (i.e., via cutting and pasting, forwarding, or linking) damaging information to broader audiences than is possible in the traditional school or neighborhood context. Email and IM text, as well as digital photos, can also be altered by savvy Internet users prior to circulation to craft even more hurtful material.

The asynchronous nature of many online exchanges is yet another unique feature of CMC. Adolescents can carefully construct emails, comments to social networking sites, and blog entries, rather than having to respond immediately as is typically the case in a telephone or face-to-face conversation. McKenna and Bargh (2000) suggest that "these differences in timing and pacing provide an

individual with a great deal more control over his or her side of a conversation. This higher degree of control, coupled with anonymity, seems to contribute to individuals taking greater risks and chances with making self-disclosures to those with whom they talk..." (p. 67). It is reasonable to expect that these same features also impact adolescents' aggressive behavior online.

Correlates of Internet Aggression

Several studies have explored the individual, familial and school correlates of involvement in Internet aggression. Ybarra and Mitchell (2004a) and Patchin and Hinduja (2006) found that Internet aggressors differed from non-aggressors with respect to their patterns of Internet use. Not surprisingly, youth who go online more frequently, and who engage in more social communicative activities online, are more likely to behave aggressively online. In other research, poor quality parent–child relationships, low levels of parental monitoring, norms supportive of bullying and poor school climate have been linked to Internet aggression (Williams and Guerra 2007; Ybarra and Mitchell 2004b, 2007). Taken together, these findings indicate that the characteristics of youth who use Internet aggression are remarkably consistent with the familial, social and behavioral profiles of youth who are aggressive in traditional contexts, such as in school. This has led some to question whether the Internet offers already aggressive youth another outlet to express hostility against disliked peers (e.g., Raskauskas and Stoltz 2007).

Evidence to support the notion that young adolescents with a history of *offline aggressive behavior* will diversify their problem behavior to include Internet aggression during the middle school years can be found in literature demonstrating (1) the continuity of aggression across childhood and adolescence (see Coie and Dodge 1998, for a review), and (2) the escalation of deviancy during adolescence among aggressive children to include involvement in delinquency and other rule-breaking behaviors (e.g., Patterson et al. 2000). Importantly, several studies have found that online aggression is, in fact, associated with traditional aggressive behavior, delinquency, substance use and other problem behaviors (Ybarra and Mitchell 2004a, b, 2007). In a recent investigation, Raskauskas and Stoltz (2007) surveyed middle school students and found that all but one student who reported engaging in electronic bullying also reported bullying peers offline. Furthermore, regression analysis indicated that offline bullying explained 27% of the variance in electronic bullying status after controlling for sex and grade. Taken together, results from these studies provide support for the idea that adolescent aggression online is committed primarily by those youth who are predisposed to aggressive behaviors in general.

Other researchers have suggested that *victimized* youth might be likely to turn to the Internet as a way to retaliate against their aggressors. As discussed previously, the anonymous nature of the Internet might be particularly important for socially marginalized adolescents who lack traditional forms of power (e.g., social status, strong physical stature)—a profile that characterizes many victims of peer aggression (e.g., Olweus 1978; Schwartz et al. 1993). Direct tests of this hypothesis, however, have yielded mixed findings. Participants in the YISS were asked to report how often they were "hit or picked on" by another child in the previous year. Their results showed that youth who engaged in Internet aggression were more likely to have been victimized offline compared to youth not involved in Internet aggression (Ybarra and Mitchell 2004a, b). In contrast, no evidence to support the association of traditional victimization with Internet aggression was found by Raskauskas and Stoltz (2007). In light of the small sample used in the latter study, differing definitions and assessments of online aggression and offline victimization, and the reliance on cross-sectional data, additional research is needed before drawing firm conclusions.

The Role of Relational Aggression

Despite interest in the role of offline aggression for youth aggression online, few studies have considered whether certain forms of traditional aggression are uniquely predictive of online aggression. Of interest in the current study was the role of *relational aggression*, a form of aggression characterized by attempts to harm others by damaging peer relationships and social status (Crick and Grotpeter 1995). Although some relationally aggressive behaviors are overt in nature (e.g., threats to withdraw friendship), relational aggression is often covert (e.g., spreading rumors about a disliked peer). In a study of children's social goals and aggression, Delveaux and Daniels (2000) reported that youth who prefer relational aggression over more overt forms of aggression wish to avoid detection and possible retaliation from their victims. These findings raise the possibility that the Internet may offer another avenue for relationally aggressive youth to harm others while maintaining their anonymity. In the only study, to date, to explore these issues, Raskauskas and Stoltz (2007) found that Internet bullying was significantly positively correlated with physical and verbal aggression (i.e., teasing) in addition to spreading rumors and excluding others perpetrated offline (each construct was assessed with a single item). However, a composite measure of traditional bullying was used in the regression analysis predicting Internet bullying, thus limiting our understanding of the unique impact of different forms of aggression.

The Role of Normative Beliefs About Aggression

Social information processing theories conceptualize beliefs about the legitimacy of aggression as a type of knowledge structure housed in the individual's "database" (Crick and Dodge 1994; Huesmann 1988). This database functions as a cross-situational, distal storehouse of information that controls behavior by imposing limits on the individual's processing of information in the immediate social environment. According to Huesmann, knowledge structures function as scripts or schemas that are influenced by past social experiences (e.g., harsh discipline or peer victimization) and, in turn, influence behavior by becoming a "lens" through which children process more proximal social information. These schemas are particularly likely to be activated when social cues in the immediate environment are unfamiliar, ambiguous, and/or complex (Burks et al. 1999). The dearth of social and contextual cues available during CMC might lead to the activation of aggressive scripts during online interactions in some youth, particularly those with a history of aggressive peer interactions.

Previous research has demonstrated that youth who hold relatively positive views of aggression are more likely to engage in aggressive behavior as rated by teachers, parents, and children (Bentley and Li 1995; Huesmann and Guerra 1997; Zelli et al. 1999). In more recent work, Werner and Nixon (2005) and Bailey and Ostrov (2008) demonstrated that normative beliefs about different forms of aggression (relational and physical) were uniquely predictive of the corresponding aggressive behaviors. In the only study to examine the relation of normative beliefs and Internet aggression, to date, Williams and Guerra (2007) found that increases of one unit on their normative beliefs scale resulted in a 24% increase in the odds of being an Internet bully. Clearly, further investigation is necessary to better understand the role of adolescents' socio-cognitive processes in the development of online aggression.

Study Hypotheses

The current study was designed to extend our knowledge of Internet aggression among early adolescents, and it had two primary goals. Our first research goal was to further investigate predictors of Internet aggression using cross-sectional data. We considered the role of sex, grade, and CMC frequency for youth engagement in aggression online. On the basis of past studies, we expected that older adolescents and those who used CMC at higher levels would be more likely to report being aggressive online compared to younger adolescents and those who used CMC at lower frequencies. We further predicted that offline

aggression, particularly relational aggression, would be a better predictor of Internet aggression status than offline victimization, and that youth who held positive beliefs about aggression would be more likely to engage in Internet aggression compared to those who evaluated aggression less positively. Finally, given prior findings of overlap between aggression and victimization online (e.g., Ybarra et al. 2007), we expected that youth who were victimized online to report being aggressive online.

Our second research goal was to increase our understanding of youth who are aggressive in *both* contexts compared to those who are aggressive in traditional contexts *only*. It is quite possible that the conditions underlying aggressive behavior may be unique for youth who are aggressive in both settings; this study represents a first attempt to disentangle these groups of adolescents. We expected that youth who spend more time communicating with friends online, who are more aggressive in traditional contexts, who hold positive beliefs about aggression, and who experience more frequent online victimization would be at increased risk of being aggressive in both contexts 1 year later.

Method

Participants

In the first year of data collection (T1), 330 students (57% female) in grades 6–8 took part in this study. This number represents 76% of the total population of 6th through 8th graders in a small northwestern city. Participants were fairly evenly distributed across the grades: Grade 6: $N = 120$; Grade 7: $N = 102$; Grade 8: $N = 108$. The following year (T2), 150 students in grades 7–8 completed the survey again (51% female). Information about ethnicity and SES were not gathered in this study. Data provided by the school district in which this study was collected, however, reveals a student population consisting of 79% White, 11% Asian, 4.5% Hispanic, 4.1% Black, and 1.3% American Indian/Alaskan Native students. Twenty-six percent of students in the district are eligible for free or reduced meals.

It is important to note that the PI did not have permission to collect data in the high school, which prevented us from collecting data from 9th graders in the second year of the study. Comparison of students who took part in the first year of data collection only with those who took part in both years revealed that the former group of students reported more frequent use of computer-mediated technologies compared to the longitudinal sample, $F(1, 327) = 7.88, p < .01$. No other differences were found.

Procedure

This project emerged from a collaborative effort involving a local middle school and university faculty intended to increase opportunities for faculty research by providing schools with useable empirical data on school climate issues. In two consecutive years, students in grades 6–8 were sent home with consent forms describing the study. Active parental consent and child assent were required for participation.

Surveys were administered by trained research assistants in students' homerooms during a 1-week period in the middle of the spring semester. Research assistants first read instructions aloud and completed sample items with the group. Students then completed the surveys on their own while research assistants monitored the room. The order of administration of the measures of interest here was: normative beliefs, Internet aggression and victimization, traditional aggression and victimization. However, due to the inclusion of other survey instruments not analyzed in this study, none of the instruments of interest in this study were administered back-to-back. Data collection took approximately 30 min per classroom. Efforts were made to include students who were absent on the day of data collection by surveying them in groups during the week after initial administration. All study procedures were approved by the Institutional Review Board of the university where the first author is a faculty member.

Measures

Internet Aggression

Students' experiences of Internet aggression were assessed using 4 items. One item (use the Internet to threaten or embarrass someone, e.g., by posting or sending messages about them for other people to see) was developed for the Youth Internet Safety Study (Finkelhor et al. 2000), and a second item (tell others to block instant messages from someone you don't like or are mad at) was adapted from the Pew Internet and Family Life Project survey (Lenhart et al. 2005). The remaining 2 items (use the Internet to play a joke or annoy someone you were mad at; make rude or nasty comments about someone else online) were written for the current study to capture other examples of aggressive behavior online. Students were asked to report how often in the previous 30 days they engaged in each act of Internet aggression on a scale that ranged from 0 (never) to 3 (5 or more times).

To our knowledge, the factor structure of existing measures of aggressive behavior on-line has not been investigated in prior research. Thus, we computed principal components factor analyses on the Internet aggression

items at both assessments. The analysis conducted on items at T1 yielded a one-factor solution (eigenvalue = 2.10) that explained 52% of the variance in Internet aggression scores. All factor loadings exceeded .57. The analysis conducted on T2 scores yielded similar results. We computed a score for Internet aggression by calculating the mean of the 4 items. Cronbach's alpha for the scale was .70 at T1 and .71 at T2.

Internet Victimization

Students' experiences of Internet victimization were assessed using 4 items identical to those measuring Internet aggression but with wording indicating that the participant was the *target* of each behavior. A principal components factor analysis conducted on the Internet victimization items at T1 yielded a one-factor solution (eigenvalue = 2.77) that explained 69% of the variance in Internet victimization scores. All factor loadings exceeded .75. Similar results were found when this analysis was conducted on T2 Internet victimization scores. We computed a score for Internet victimization by calculating the mean of the 4 items. Cronbach's alpha for the scale was .85 at T1 and .67 at T2.

Computer-Mediated-Communication (CMC)

Participants rated how frequently they used Internet-based tools for the purpose of social communication (i.e., When you're not actually with your friends, how often do you communicate with them using...) on a scale ranging from 1 (less often than a few times per year) to 5 (every day). Students reported on their use of: email, chat rooms, instant messaging, and blogs. A principal components factor analysis conducted on the CMC items yielded a single factor (eigenvalue = 2.1) and explained 53% of the variance in scores. Factor loadings ranged from .56 to .81. The factor structure was similar at T2 with loadings ranging from .47 to .85. A composite variable for CMC was created by summing across the individual items. Cronbach's alpha was .70 at T1 and .68 at T2.

"Regular users" were defined as participants who reported daily use of at least one Internet tool. Using this criterion, 30% of youth at T1 were regular users, and 31% reported never using an Internet tool for social communication.

Traditional (Offline) Aggression

Traditional peer aggression was assessed with 9 items rated on 4-point scales ranging from 0 (never in the last 30 days) to 3 (5 or more times in the last 30 days). Four items assessed physical and verbal forms of aggression (e.g., push, shove, slap, or kick; tease). These items were taken from the Bullying Scale (Bosworth et al. 1999), an

instrument with demonstrated psychometric properties. Five items assessing relational aggression were written for the current study and included “exclude students” and “try to get your friends to turn against a student”. Previous studies with younger samples using other instruments have demonstrated that relational and overt (i.e., physical and verbal aggression) forms of aggression are correlated yet distinct constructs (see Crick et al. 1999).

To evaluate the factorial structure of the items used in the current study, we conducted a confirmatory factor analysis using MPlus 4.21 (Muthén and Muthén 2007) on the 9 aggression items. Results confirmed that a three-factor model in which items were allowed to load on their respective factors of physical aggression, verbal aggression, and relational aggression fit the data better than the one- and two-factor models. Overall fit of the three-factor model was adequate (RMSEA = .057, SRMR = .039, CFI = .96). We computed scores for relational aggression ($\alpha = .65$ at T1 and $.67$ at T2), verbal aggression ($\alpha = .72$ at T1 and $.73$ at T2) and physical aggression ($\alpha = .50$ at T1 and $.60$ at T2) by averaging across the items making up each subscale.

Traditional (Offline) Victimization

Traditional peer victimization was assessed using 9 items that were identical to those measuring aggression but with wording indicating that the participant was the *target* of the behaviors. Items were rated on 4-point scales ranging from 0 (never in the last 30 days) to 3 (5 or more times in the last 30 days). Confirmatory factor analysis indicated that a three-factor model fit the data better than the one- and two-factor models. Overall fit of the three-factor model was good (RMSEA = .049, SRMR = .031, CFI = .98). We computed scores for relational victimization ($\alpha = .82$ at T1 and $.77$ at T2), direct verbal victimization ($\alpha = .81$ at T1 and $.82$ at T2) and physical victimization ($\alpha = .62$ at T1 and $.66$ at T2) by averaging across the items making up each subscale.

Creation of Aggression and Victimization Groups

Due to the fact that the variables described above were not normally distributed, we created groups based on students' reported experiences of traditional and online aggression and victimization. The majority of prior studies of Internet aggression have defined aggressors as individuals reporting engagement in *any* aggressive behavior online within the specified reporting period (e.g., Raskauskas and Stoltz 2007; Wolak et al. 2007; Ybarra and Mitchell 2004a). Ybarra and Mitchell (2007) recently compared the dichotomous definition with a categorical definition based on the frequency of Internet aggression

perpetration (none, limited, occasional and frequent) and found that the associations with behavioral and psychological problems were similar across the definitions. To ensure adequate cell sizes for conducting statistical analyses, we classified students who reported any acts of Internet aggression (as perpetrator or victim) in the previous month as Internet aggressors or victims. Eighteen percent of students met the criteria for Internet aggressor, and 17% were Internet victims.

For the sake of consistency, we used the same criteria described previously to classify students as traditional aggressors and victims. Eighty-three percent of youth were identified as traditional aggressors; and 81% were traditional victims. The percentage of youth classified as traditional aggressors was somewhat higher in this study than in other reports (e.g., Raskauskas and Stoltz 2007), although differing operational definitions of aggression and cut-off scores for identifying aggressors are likely the cause. For example, in the Raskauskas and Stoltz study, traditional aggression items were rated on a 4-point scale ranging from “not at all like me” to “a lot like me”. Traditional aggressors (64% of the sample) included youth who rated at least one item higher than “not at all like me”. This measurement strategy differs from that used in the current study, in which participants rated their aggression on a scale that included discrete frequency estimates (i.e., “never in the last 30 days” to “5 or more times in the last 30 days”).

Normative Beliefs About Aggression

Normative beliefs about relational and overt (physical and direct verbal) aggression were assessed at T1 and T2 with items used in prior research (Huesmann and Guerra 1997; Werner and Nixon 2005). Participants rated the acceptability of aggressive behaviors on 5-point Likert scales, with higher scores reflecting greater approval of aggression. Normative beliefs about relational aggression were assessed with 3 items (e.g., “In general, it is OK to tell your friends not to be friends with someone you don't like”); beliefs about overt aggression were assessed with 4 items (e.g., “In general, it is OK to hit other people”).

To evaluate the factorial structure of these scales, we conducted a confirmatory factor analysis using MPlus 4.21 (Muthén and Muthén 2007) on the 7 normative beliefs items. The two-factor model provided an excellent fit to the data at T1 (RMSEA = .04, SRMR = .02, CFI = .99) and a better fit than a one-factor model. Scale scores were created by averaging across the items making up each scale. In the current study, the beliefs about relational aggression and beliefs about overt aggression scales demonstrated acceptable reliability at T1 ($\alpha = .64$

and .87, respectively) and at T2 ($\alpha = .62$ and $.85$, respectively).

Results

Descriptive Analyses

Table 1 provides descriptive statistics and intercorrelations for all study variables. We first examined students' use of CMC and sex and grade differences in their reports of Internet aggression and victimization. To explore grade and sex differences in CMC (regular users vs. not regular users), we computed a series of Chi square analyses on data from T1. There was a significant sex difference in group composition, $\chi^2 (1, N = 322) = 8.67, p < .01$. In addition, the effect of grade was significant, $\chi^2 (2, N = 322) = 12.20, p < .01$. These analyses showed that the regular user group was comprised of more females than males (68.9 vs. 31.1%), and of more 8th graders (47.8%) than 6th (26.7%) or 7th graders (25.6%).

Sex and grade differences in students' experiences of Internet aggression and victimization were explored by computing a 2 (sex) by 2 (aggression/victimization group: aggressive/victimized vs. non-aggressive/victimized) Chi square analysis and a 3 (grade) by 2 (aggression/victimization group) analysis. No significant differences in Internet aggression were found for grade, $\chi^2 (2, N = 322) = 2.56, p > .05$ or for sex, $\chi^2 (1, N = 322) = .60, p > .05$. Similarly, youth experiences of Internet victimization did not vary by grade, $\chi^2 (1, N = 322) = .16, p > .05$ or sex, $\chi^2 (1, N = 322) = 1.34, p > .05$.

Goal 1: Concurrent Predictors of Internet Aggression

Our first research question concerned predictors of youth involvement in Internet aggression at the initial assessment. We used logistic regression to test hypotheses pertaining to the roles of CMC, normative beliefs about aggression, and traditional aggression and victimization in youth reports of engaging in at least one recent act of Internet aggression. We also included students' reports of online victimization as a predictor of involvement. Predictors were entered in a stepwise fashion to evaluate the unique and additive effects of each variable or set of variables. We initially ran models with interaction terms involving adolescent sex (e.g., CMC X sex) and found no significant associations. For clarity, we do not discuss them or present them in the tables. In Table 2, we present the results from this series of logistic regressions. The unstandardized coefficients are given along with the odds ratios in parentheses.

In the first step, three control variables were entered: sex, grade, and CMC. Only CMC emerged as a significant predictor of Internet aggression. Consistent with hypotheses, youth who engaged in higher levels of CMC were more likely than other youth to engage in Internet aggression. The odds ratio of CMC in step 1 (1.22) indicates that for every unit increase in CMC, the odds of engaging in Internet aggression increase by 22%.

In the second step, we examined whether normative beliefs about overt and relational aggression were associated with Internet aggression. Both variables were significant predictors, such that greater approval of aggression was associated with an increased likelihood of engaging in Internet aggression. For norms about relational aggression,

Table 1 Correlations and descriptive statistics for all study variables ($N = 350$)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Relational agg	—										
2. Verbal agg	.61***	—									
3. Physical agg	.38***	.51***	—								
4. Internet agg	.45***	.33***	.36***	—							
5. Relational vic	.41***	.37***	.32***	.26***	—						
6. Verbal vic	.31***	.47***	.34***	.16**	.66***	—					
7. Physical vic	.28***	.38***	.51***	.18**	.47***	.56***	—				
8. Internet vic	.45***	.28***	.23***	.64***	.37***	.27***	.25***	—			
9. RA norms	.46***	.35***	.30***	.31***	.20***	.20***	.16**	.18**	—		
10. OA norms	.37***	.43***	.44***	.29***	.12*	.22***	.25***	.16**	.65***	—	
11. CMC	.07	.05	.36***	.27***	-.02	.04	.18***	.15**	.11	.09	—
<i>M</i>	.39	.50	.54	.36	.55	.61	.48	.43	2.02	1.62	1.89
<i>SD</i>	.46	.70	.58	1.11	.68	.86	.66	1.41	.78	.69	.95
Range	0–2.5	0–3	0–3	0–2.25	0–3	0–3	0–3	0–3	1–4	1–4	1–5

RA relational aggression, OA overt aggression, CMC computer-mediated communication, Vic victimization, Agg aggression

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

Table 2 Logistic regression models predicting Internet aggression at T1 ($N = 322$)

Predictors	Step			
	1	2	3	4
Sex	-.09 (.91)	-.46 (.63)	-.62 (.54)	-.53 (.59)
Grade	.03 (1.03)	-.06 (.94)	-.15 (.86)	-.16 (.86)
CMC	.20*** (1.22)	.20*** (1.22)	.23*** (1.26)	.21*** (1.23)
RA norms	–	.57* (1.78)	.01 (1.01)	-.28 (.76)
OA norms	–	.76** (2.14)	.51 (1.66)	.78 (2.19)
Relational agg	–	–	1.72*** (5.57)	2.38*** (10.78)
Physical agg	–	–	.24 (1.27)	.43 (1.53)
Verbal agg	–	–	.46 (1.58)	.64 (1.89)
Internet vic	–	–	–	2.78*** (16.16)
Relational vic	–	–	–	-.57 (.57)
Physical vic	–	–	–	.22 (1.25)
Verbal vic	–	–	–	0.34 (.71)
<i>df</i>	3	2	3	4
Model R^2	.15	.28	.43	.57
Step $\Delta\chi^2$	30.35***	29.12***	37.46***	40.89***

Unstandardized logistic coefficients with odds ratios in parentheses

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

a change of one unit was associated with a 78% increase in the odds of participating in Internet aggression. A change of one unit in overt aggression norms was associated with an increase of 114% in the odds of engaging in Internet aggression.

In the third step, we considered the impact of adding students' reports of traditional relational, physical, and verbal aggression as predictors of Internet aggression. Relational aggression—but not physical or verbal aggression—emerged as a significant positive predictor of Internet aggression. The odds ratio for relational aggression indicated that a one-unit change in relational aggression was associated with an increase of 457% in the likelihood of participating in Internet aggression. It is also important to note that in the third step, normative beliefs about aggression were no longer significant predictors of Internet aggression, suggesting that engaging in traditional

aggression may mediate the association between youth normative beliefs and their online aggression.

The fourth step involved an examination of whether various forms of victimization were predictive of Internet aggression. Note, first, that our full model explained well over 50% of the variance in Internet aggression. Results at this step revealed that Internet victimization, but not traditional forms of victimization, predicted involvement in Internet aggression. Internet victimization was strongly positively associated with being aggressive online: a one-unit change in Internet victimization was associated with an increase of 1,500% in the likelihood of engaging in Internet aggression.

Goal 2: Distinguishing Online + Offline Aggressors from Online Aggressors Only

Our final series of models was designed to disentangle youth who participated only in traditional aggression (but who were not aggressive online; $N = 90$) from youth who reported engaging in both traditional and Internet aggression ($N = 36$) using data collected 1 year prior. We used the same predictors as in the previous analysis; however the order of entry was modified such that normative beliefs about aggression were entered last in the models to determine if beliefs predicted unique variance in aggression status after all other predictors were included. As with the cross-sectional models, we tested interactions involving adolescent sex and found no significant associations. The results of this analysis can be found in Table 3.

In step one, we considered the same three control variables as in the previous set of analyses. Only grade was a longitudinal predictor of group status. The odds ratio indicated that an increase of one unit (i.e., one grade) was associated with an increase of 154% in the likelihood of students engaging in both Internet and traditional aggression versus traditional aggression only. In the second step, we added reports of traditional relational, physical and verbal aggression, in addition to Internet aggression scores at the initial assessment. Contrary to predictions, none of the aggression variables distinguished between groups of Internet aggressors the following year.

The third step involved the addition of victimization variables. Only prior levels of Internet victimization emerged as a significant predictor of group membership. The odds ratio for Internet victimization (4.85) indicated that for every unit increase in Internet victimization, the odds of membership in the group characterized by engaging in Internet plus traditional aggression, versus traditional aggression only, increased by 385%.

In the final step, we considered normative beliefs about aggression. For beliefs about relational aggression—but not overt aggression—a significant pattern materialized.

Table 3 Logistic regression models predicting involvement in traditional aggression alone ($N = 90$) versus traditional plus Internet aggression ($N = 36$) at T2 from T1 predictors

T1 predictors	Model			
	1	2	3	4
Sex	-.03 (.97)	.17 (1.18)	.05 (1.05)	.15 (1.16)
Grade	.93* (2.54)	.93* (2.54)	1.26* (3.51)	1.58** (4.85)
CMC	.11 (1.11)	.11 (1.12)	.14 (1.16)	.11 (1.12)
Relational agg	-	.23 (1.26)	.25 (1.28)	-.28 (.75)
Physical agg	-	.32 (1.41)	.60 (1.81)	.73 (2.08)
Verbal agg	-	.81 (2.25)	.65 (1.92)	.84 (2.31)
Internet agg	-	-.21 (.81)	-.91 (.40)	-1.26 (.29)
Internet vic	-	-	1.58* (4.85)	1.76* (5.83)
Relational vic	-	-	.78 (2.17)	.65 (1.91)
Physical vic	-	-	-.45 (.64)	-.38 (.69)
Verbal vic	-	-	.03 (1.04)	-.10 (.91)
RA norms	-	-	-	1.09* (2.98)
OA norms	-	-	-	-.44 (.65)
<i>df</i>	3	4	4	2
Model R^2	.09	.19	.30	.36
Step $\Delta\chi^2$	7.61	9.24	12.29*	6.12*

Unstandardized logistic coefficients with odds ratios in parentheses
 * $p < .05$, ** $p < .01$

For every unit increase in approval of relational aggression, the odds of being an Internet plus traditional aggressor increased by 198%.

Discussion

The present study was designed to increase our understanding of adolescent aggressive behavior on the Internet. The majority of prior studies on this topic have focused on older adolescents, reflecting the assumption that these behaviors occur infrequently at younger ages. Our results demonstrated that early adolescence is a time of significant growth in the use of the Internet for social communication

purposes, and that a significant percentage of youth in grades 6 through 8 have been involved in Internet aggression either as perpetrators (18%), victims (17%), or both (9.5%). These findings are consistent with those of a recent study of over 3,000 middle school youth (Kowalski and Limber 2007). In contrast to some research, we did not find significant grade or sex differences in Internet aggression or victimization, although this might have been due to our relatively small sample and the restricted range of grades studied. Our findings add to a growing body of literature pointing to the need for prevention efforts beginning in late middle childhood that target online harassment prior to the onset of children’s use of the Internet for CMC.

Our first research goal was to examine concurrent predictors of Internet aggression. Consistent with prior investigations, we found that regular users of CMC applications such as IM, email, and social networking sites engaged in higher levels of online aggression. These findings might simply reflect an increased opportunity for more “wired” youth to become involved in aggressive exchanges online. Another interpretation has been offered by Patchin and Hinduja (2006), who suggested that “online ‘power’ stems from proficiency” rather than from physical stature or social status (p. 152). According to this view, adolescents who are more knowledgeable regarding technology have power over less knowledgeable youth, and this power imbalance might lead to bullying online. Regardless of our interpretation, these findings point to the need to educate adults about the risks associated with children’s online social interaction during the early adolescent years, particularly when use is frequent. Psychologists and educators have been very successful in recent decades in disseminating information to the public about the need to actively monitor children’s television use. With the exception of advocating the use of filtering software to protect children from harmful Internet content, however, relatively little is understood about other strategies that parents use to monitor children’s behavior online and to enforce rules about Internet use. This is clearly an important direction for future research.

Another important finding from the current study was that youth who reported being the targets of Internet victimization were 16 times more likely than non-victimized peers to report engaging in aggression themselves over the Internet. These findings are consistent with other work in this area (Kowalski and Limber 2007; Ybarra and Mitchell 2004b; Wolak et al. 2007), suggesting that there is substantial fluidity in the aggressor and victim roles when the Internet is the so-called battleground. Longitudinal research is needed to determine the direction of effects. Does online victimization lead to aggressive retaliation online, or does online aggression incite retaliatory attacks

by victims? It will also be important to distinguish youth who are involved in both roles online from those who are victimized but not aggressors. Important clues are found in the studies by Kowalski and Limber, who reported that girls were overrepresented in the bully/victim group, and by Wolak et al., who found that the likelihood that victimized youth would engage in Internet aggression was particularly high when youth were victimized on the Internet by known peers (the majority of whom were female) as compared to online contacts only. Together, these results suggest that girls might be particularly susceptible to becoming entrenched in cycles in which aggressive attacks against classmates incite retaliation and so on.

We sought to examine the relations of different forms of traditional aggression and victimization with adolescents' engagement in Internet aggression. Consistent with one recent study (Raskauskas and Stoltz 2007), we found no evidence to support the hypothesis that youth who are *victimized* in traditional contexts are drawn to the Internet, perhaps as a means for retaliating against offline aggressors. In contrast, our results showed that adolescents who were *aggressive* in traditional contexts were more likely to report engaging in aggression on the Internet. These findings provide support for the hypothesis that the Internet offers a tool for already aggressive youth to aggress against disliked peers in perhaps more damaging ways and with increased anonymity than is permitted in traditional contexts. Another interpretation is that online aggression reflects a general deviancy escalation process, whereby aggressive children diversify their antisocial behavior during adolescence with the help of deviant peers (Patterson et al. 2000; Werner and Crick 2004). Some support for this hypothesis is found in the results of the Wolak et al. (2007) study in which harassment by known peers was somewhat more likely to involve multiple peers compared to harassment by on-line contacts only.

It is noteworthy that traditional relational aggression, but not overt forms of aggression, was associated with online aggression. In fact, youth who were relationally aggressive offline were approximately ten times more likely than non-relationally aggressive youth to aggress over the Internet. Raskauskas and Stoltz (2007) also found significant associations between Internet bullying and traditional forms of aggression (physical, teasing, rumor-spreading, and exclusion); however, they did not examine the unique contributions of each form to online aggression. Although not all harassing behavior perpetrated online fits the definition of relational aggression (e.g., online threats to physically harm someone would be considered *physical aggression*, an email sent to a single recipient containing racial insults would constitute *verbal aggression*), the Internet clearly offers unique and powerful tools for adolescents to harm others by manipulating relationships and

feelings of inclusion. For example, the size of one's IM buddy list and the number of comments posted to one's Myspace page are visible indicators of social impact, and as such, can be utilized in a relationally aggressive attack. The high levels of disclosure of personal information in private (e.g., email) as well as public (e.g., social networking sites) domains (McKenna and Bargh 2000) also provides online youth with opportunities not present in traditional contexts to inflict harm on peers. Support for this hypothesis comes from Wolak et al. (2007), who found that harassment by peers known to the victim was likely to involve someone sending or posting messages for others to see (similar to gossip), whereas harassment by on-line contacts only was more likely to involve direct exchanges between aggressor and victim.

It is important to note that not all aggressive youth in our sample were aggressive online. Our second research aim was therefore to utilize longitudinal data to distinguish youth who were aggressive in traditional contexts only from those who were aggressive in traditional *and* online contexts. This is the first study, to date, to address this important question. We were surprised to find that frequency of CMC assessed 1 year prior did not significantly differ between these two groups of adolescents. Being a victim of Internet aggression, on the other hand, increased adolescents' risk 1 year later of being an aggressor in both traditional and online contexts by more than five times. It appears that specific negative experiences online, rather than the amount time adolescents spend engaged in CMC, might be able to shed some light on why some aggressive youth are attracted to the Internet as a medium for the expression of aggression.

We were also surprised to find that prior levels of traditional aggression did not distinguish traditional plus Internet aggressors from traditional aggressors only 1 year later. In contrast, students who held positive views of relational aggression were almost three times more likely to be traditional plus Internet aggressors, as compared to students who held beliefs that were unsupportive of relational aggression. Given that relational and overt aggression were uncorrelated with future Internet aggression in these analyses, the predictive utility of normative beliefs cannot be explained by its covariation with traditional aggression at the initial assessment. Only one other study, to date, has explored the role of normative beliefs about aggression for youth involvement in Internet aggression. Williams and Guerra (2007) found that students' moral approval of bullying increased their risk for engagement in Internet bullying.

Some researchers have suggested that the absence of nonverbal cues that signal appropriate interactions can result in offensive online behavior, albeit unintentional (Ybarra and Mitchell 2004a). The current findings take this explanation a step further by positing that the dearth of

contextual information in CMC, coupled with other unique features of this form of communication, might influence online behavior via activation of social information processing patterns. Consider the following illustration. An adolescent girl is working on her homework online in the evening from home. She sees that her best friend is online too, and she sends her an instant message, however, the friend does not respond. According to social information processing theories (Crick and Dodge 1994), the ambiguous nature of this brief online exchange should elicit individual differences in the encoding and interpretation of the exchange. In addition, schemas and scripts, derived from past experience, will influence how the individual processes the available information. An adolescent who holds a generalized set of beliefs that support the use of relational aggression is at increased risk of interpreting this situation as threatening and responding in an aggressive manner, particularly if she has had negative experiences online in the past. Of note in the current study is that normative beliefs about relational aggression predicted membership in the group of youth aggressive in both contexts above and beyond Internet victimization, suggesting that being an online victim alone does not fully explain aggressive behavior online. On a positive note, previous research has shown that children's social cognitions about aggression can be modified (Conduct Problems Prevention Research Group 1999; Hudley et al. 1998; Hudley and Graham 1993, 1995) and as such, efforts to influence perceptions regarding the appropriateness of online aggression might prove to be a fruitful avenue for prevention in this area.

The current study is not without limitations. First, because we did not attempt to follow students across the transition to high school, our sample size and resulting statistical power for longitudinal analyses was smaller than for the concurrent analyses. In addition, we were limited to students' self-reports of aggression (traditional and online), which might have been susceptible to social desirability bias and problems with shared method variance. Although there are certainly limitations to using self-reports of aggressive behaviors, when studying adolescents' use of more covert forms of aggression (e.g., relational, online) this methodology may in fact be preferable over relying on the perspective of another reporter. Of particular note is the fact that adolescents spend less time under the direct supervision of parents or a single classroom teacher compared to middle childhood, and as such these informants may have an incomplete understanding of the adolescent's daily experiences. Although we relied on self-reports, as a part of the larger study we collected teacher ratings of traditional relational aggression for a subsample of participants and found that self-reports of relational aggression and Internet aggression were significantly correlated with

teacher ratings of the same constructs (however, only for females). These findings increase our confidence in the self-report methodology used here. That being said, other methods are available for studying adolescent online behavior, and future studies will benefit from utilizing methods such as content analysis of IM logs, Myspace comments, and blogs; having adolescents keep dairies documenting their online interactions; and conducting online surveys (e.g., Schmitt et al. 2008; Subrahmanyam et al. 2004, 2008).

A final limitation concerns the fact that we were not able to determine the role of SES, race or ethnicity for youth engagement in Internet aggression. Internet usage patterns have been found to vary across SES and ethnic groups (Pew Internet & American Life Project 2008). Nonetheless, very little attention has been paid to demographic differences in adolescent Internet aggression. Studies that have addressed this issue have yielded inconsistent findings. For example, Ybarra and Mitchell (2007) found that White youth and Hispanic youth were overrepresented in the frequent perpetrator of Internet harassment group, whereas Wolak et al. (2007) reported non-significant effects of demographic characteristics on Internet harassment. Household income and parental education were not associated with Internet aggression in either study. It is possible that demographic characteristics would have distinguished between youth in the present study who were aggressive offline only with those aggressive offline and online, with Anglo-American youth falling disproportionately in the latter group due to greater access to wireless technologies. Because frequency of CMC use was not a significant longitudinal predictor of online plus offline aggression in the current study, however, this hypothesis is implausible. It will be important for future studies, particularly those with large and diverse samples (e.g., YISS), to consider the role of SES, race and ethnicity for Internet aggression more critically.

The results of the current study provided needed information about online aggressive behavior during early adolescence, and in particular, about the roles of traditional relational aggression and normative beliefs about relational aggression for Internet aggression. Our findings indicate that early adolescent online aggressors closely resemble traditional aggressors; however, additional longitudinal research is needed to further investigate the extent to which unique predictors of online aggression can be identified. Another topic for future investigation is the psychosocial or academic impact of youth involvement in Internet aggression. Existing data on this issue are mixed, with the popular press often portraying cyberbullying as a "serious" problem that causes high levels of emotional distress and damage (e.g., Beckerman and Nocero 2003; Blair 2003), whereas the results of empirical studies, on the other hand,

are widely discrepant regarding the percentage of online victims who describe these experiences as very disturbing (Finkelhor et al. 2000; Lenhart et al. 2001; Patchin and Hinduja 2006; Wolak et al. 2007). Nonetheless, most experts agree that technology is dramatically altering children's social lives, and that continued research is needed into the complex ways in which child development is impacted by technology.

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