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WHERE DOES ELECTRONIC AGGRESSION FIT?: A COMPARISON OF DIMENSIONAL AND CATEGORICAL MODELS OF ADOLESCENT AGGRESSION

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

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Abstract

WHERE DOES ELECTRONIC AGGRESSION FIT?: A COMPARISON OF DIMENSIONAL AND CATEGORICAL MODELS OF ADOLESCENT AGGRESSION

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Electronic aggression is a rapidly growing focus of research, but it lacks a unifying theoretical framework that is necessary to advance the field. The lack of a theoretical framework has led to inconsistencies in measurement of electronic aggression, making it difficult to draw conclusions across studies. In general, researchers have assumed that electronic aggression constitutes a new form of aggression, a counterpart to physical, verbal, and relational aggression, due to unique features surrounding the perpetration of electronic aggression. Furthermore, researchers have treated electronic aggression as a categorical variable based on the assumption that "cyberbullies" constitute a distinct group of adolescents. However, these assumptions have not been empirically tested. It is possible that media represents an additional dimension on which aggression can be classified. The purpose of this study was to test competing models of aggression. It was hypothesized that form of aggression (i.e., physical, verbal, and relational) would be more salient in explaining

relations among aggressive behaviors than media (in-person or electronic). It was also hypothesized that adolescents who perpetrated aggression would not be distinguished by what media they used to perpetrate aggression. Finally, it was hypothesized that a dimensional model would provide a better explanation of aggression than a categorical one. Participants were 1052 sixth, seventh, and eighth grade students from three public schools in a medium-sized city in the southeastern United States. All grades were approximately equally represented (352 sixth grade students, 350 seventh grade students, 340 eighth grade students). The racial composition of the sample was 76% Black or African American, 15% multiracial, 6% European American, and 2% American Indian or Alaska Native. Fifteen percent of participants reported that their ethnicity was Hispanic or Latino. Data were collected in the fall, winter, spring, and summer beginning in the winter of 2010. Due to the cross-sectional nature of this study, one data point was randomly selected for each participant. Among other measures, participants completed the Problem Behavior Frequency Scale - Revised, a self-report measure that assessed the extent to which they engaged in physical, verbal, relational, and electronic aggression. Interestingly, a confirmatory factor analysis that took both media and form into account provided the best model to explain adolescent aggression. A latent profile analysis revealed two groups of adolescents: a moderately aggressive class and a low aggressive class. As hypothesized, neither group was distinguishable by the media they used to perpetrate aggression. Also as hypothesized, a comparison of the confirmatory factor analysis model and the two-class solution of the latent profile analysis indicated that a dimensional model provided the best fit. This study supports

a theoretical framework of aggression in which aggression is classified both by form and media.

Where does electronic aggression fit?: A comparison of dimensional and categorical models of adolescent aggression

Peer-targeted aggression is a serious and prevalent problem among adolescents. Adolescents are involved in over a third (38%) of all violent crimes, either as victims or perpetrators. In a 2009 nationally representative sample, about 32% of adolescents reported being in a physical fight over the past year, and 18% reported carrying a weapon over the past month. Further, it is estimated that adolescents experience victimization at twice the rate of adults (Baum, 2005). Peer-targeted aggression has typically been classified by form, motivation, and directness. However, traditionally aggression has taken place in person. The rapid increase in various forms of technology has allowed adolescents to interact electronically as well, not only increasing opportunities for aggression but also creating different ways aggression can be perpetrated. Despite a growing body of research on electronic aggression, there is little consistency across studies in definitions and measurement. This inconsistency is likely due to the lack of a shared understanding of what constitutes electronic aggression and how it fits theoretical into a broader framework of adolescent aggression.

The high rates of aggression in adolescence as well as the appearance of the relatively new phenomenon of electronic aggression are concerning because involvement in aggression predicts poor adjustment for both perpetrators and victims. Victimization predicts depression, anxiety, aggression, and substance use (Hawkins & Boulton, 2000; Sullivan, Farrell, & Kliewer, 2006). Aggression in adolescence has been shown to predict poor adjustment, involvement in the legal system, difficulties in romantic relationships, and substance use in

adulthood (Cook, Williams, Guerra, Kim, & Sadek, 2010; Werner & Crick, 1999). Perpetration of aggression is related to a range of other problem behaviors, including delinquency and peer deviance (Dijkstra et al., 2010; Monahan, Steinberg, & Cauffman, 2009).

Prior to the emergence of electronic aggression, the theoretical framework of aggression included multiple dimensions, including form. Specifically, physical aggression includes physical threats, assault, and provocation, such as spitting or shoving, as well as stealing and destruction of property. Verbal aggression, on the other hand, includes name-calling, teasing, mocking, and taunting (Martin & Huebner, 2007). Relational aggression targets adolescents' social relationships and status through rumor-spreading, exclusion, and social isolation (Baumeister & Leary, 1995; Crick & Grotpeter, 1995). Another dimension along which aggression has been classified is the level of confrontation. Aggression can be direct or overt, such that the aggressor is directly confrontational, or it can be indirect or covert, such that the aggression is perpetrated outside of the victim's presence.

Traditionally, perpetration of aggression has taken place in person, in physical places such as school property or the neighborhood. Even indirect forms of aggression, such as rumor spreading, involve face-to-face communications despite the absence of the person who is targeted by the aggression. However, the rapid increase in communication technologies has allowed adolescents to interact electronically as well, increasing opportunities for aggression and expanding ways in which aggression can be perpetrated. For example, text messaging is the most common way adolescents contact their friends (Lenhart, Ling, Campbell, & Purcell, 2010). In 2009, 75% of 12 to 17 year olds reported owning a cell phone, and almost 75% of

adolescents used social networking sites. Use of communication technologies is increasing; for example, from 2008 to 2009, the percentage of adolescents who texted their friends daily increased from 38% to 54% (Lenhart et al., 2010).

Electronic aggression is a form of aggression that uses electronic media such as cell phones or the internet to humiliate, harass, or taunt one's peers. Estimates of the prevalence of electronic aggression have ranged from 5% to 44% (Calvete, Orue, Estevez, Villardón, & Padilla, 2010; Williams & Guerra, 2007). In general, electronic aggression has been found to have lower prevalence rates than physical, verbal, or relational aggression (e.g., Sourander et al., 2010). Despite a growing body of research on electronic aggression, few researchers have discussed how electronic aggression expands the framework of traditional aggression or have linked theories of aggression to the relatively new phenomenon of electronic aggression. In 2006, the Centers for Disease Control and Prevention (CDC) called attention to the lack of organization and coordinated research on electronic aggression (David-Ferdon & Hertz, 2007). However, electronic aggression research continues to be disorganized, lacking a strong and comprehensive theoretical framework that could provide much-needed structure to unify current research and guide future research and prevention in this area.

One outstanding question in the field of electronic aggression is whether electronic aggression is the same as in-person aggression (i.e., physical, verbal, or relational), but is simply perpetrated through electronic media instead of in person. That is, is form still a salient and effect method of classifying aggression, or is the media that adolescents use to perpetrate aggression more meaningful than form in explaining relations across aggressive behaviors. All studies incorporating electronic aggression identified in this literature review

measured and analyzed electronic aggression as a distinct form of aggression, a counterpart to physical, verbal, and relational in-person aggression. Whereas there is currently no statistical evidence to support electronic aggression as a distinct form, there is some theoretical support for separating out electronic aggression. Specifically, there are qualitative differences between electronic and in-person aggression. Researchers have pointed to the ease of access to electronic communication technologies, the potential for an unlimited audience, disinhibited behavior online, and lack of nonverbal cues in electronic-mediated communications as important unique features of electronic aggression (e.g., Kiesler, Siegel & McGuire, 1984; Suler, 2004; Tokunaga, 2010). For example, electronic aggressors cannot see the emotional reactions of their victims or of bystanders (Kowalski & Limber, 2007), which serve as a natural check for adolescents' behavior. Similarly, there is less social context online. At school and in the community, adolescents have reputations, images, and relationships to protect. Depending on the adolescent's peer culture and personal goals, perpetrating aggression can either damage or promote the ability to meet his or her goals. Compared to in-person aggression, electronic aggression may have fewer and less meaningful repercussions.

Although electronic and in-person aggression are qualitatively different in some respects, they share significant similarities. For example, electronic aggression can be anonymous. In fact, as many as half of electronically victimized adolescents do not know the identity of their aggressor (e.g., Kowalski & Limber, 2007). This is similar to indirect aggression, in which there is no confrontation, such that victims may not know the identity of their aggressors. Additionally, similar to relational aggression, electronic aggression makes it

possible for adolescents to be re-victimized. With electronic aggression, there is a potential for an unlimited audience (Slonje & Smith, 2008), and every time a new person views the aggression, the adolescent may be re-victimized. For instance, if students view a humiliating social network profile of an adolescent, their offline interactions with that adolescent will likely be negatively impacted because their perception of that adolescent has changed. Along the same lines, rumor spreading or social exclusion constantly re-victimizes the target of relational aggression.

Considering the similarities between in-person and electronic aggression, electronic aggression may simply be aggression perpetrated through electronic media, rather than a new form of aggression altogether. That is, media may represent an additional dimension for the classification of aggression. In support of this, researchers generally include both relational (e.g., rumor spreading) and physical and verbal aggression (e.g., threatening physically, calling names) in their measures of electronic aggression (e.g., Bauman, 2009). It may be inaccurate to assume that sending a direct, threatening text message is part of the same construct as setting up a fake, humiliating Facebook profile simply because they are both perpetrated through electronic media as opposed to being perpetrated in person. On the other hand, significant qualitative differences may cause different forms of aggression perpetration through electronic media to be more closely related to each other, regardless of form. Further research using statistical methods is needed to test those competing models of aggression.

The following section provides the background for a study designed to test competing models to account for the relations among electronic aggression and physical, verbal, and relational aggression. It first discusses theories of aggression as they relate to the occurrence

of electronic aggression in middle school. It explores how theoretical differences and similarities between electronic aggression and in-person aggression have implications for the classification of electronic aggression. The extent to which theories of aggression explain research on electronic aggression are discussed, and theory of online behavior is identified as a helpful supplement to current theories of aggression. Literature on the prevalence of electronic aggression is reviewed. Finally, studies that have examined relations among electronic aggression and in-person aggression are discussed.

Review of the Literature

Traditional Classifications of Aggression

Peer-targeted aggression, defined as behavior intended to cause harm or discomfort, is prevalent among adolescents. An estimated 40 to 80% of American adolescents are victims of peer aggression at some point in their lives (Juvonen & Graham, 2001). The prevalence of peer aggression is troubling because of the maladaptive outcomes experienced by adolescents who are involved in aggression, as perpetrators or victims. Aggression in adolescence predicts poor adjustment, involvement in the legal system, difficulties in romantic relationships, and substance use in adulthood (Cook et al., 2010; Werner & Crick, 1999). Victimization is predictive of depression, anxiety, suicidal ideation, academic adjustment, aggression, and substance use (Gastic, 2008; Hawkins & Boulton, 2000; Sullivan et al., 2006). Though aggression has traditionally been limited to school and the community, technologies such as cell phones and the internet have allowed aggression to occur anytime and anywhere, thereby increasing opportunities for adolescents to cause harm to each other.

Peer-targeted aggression has been classified by the form, motivation, and level of confrontation involved. Forms of aggression that have been identified are physical, verbal, and relational aggression. Physical and verbal aggression were the focus of early work conducted by Dan Olweus in the 1970s (e.g., Olweus, 1978). Physical aggression involves physical threats, assault, and provocation (e.g., pushing, spitting, hitting, kicking) as well as stealing and destruction of property. Verbal aggression, on the other hand, involves name-calling, teasing, mocking, and taunting (Martin & Huebner, 2007). Physical and verbal aggression are typically studied together and are almost always assessed with the same measure. Both physical and verbal aggression target an adolescent's dignity, feelings of safety, and sense of self (Bukowski & Sippola, 2001). Relational aggression, which targets an individual's social relationships, status, and reputation, was introduced by Nikki Crick in the 1990s as a form of aggression that had been largely overlooked by researchers (Crick & Grotpeter, 1995). Relational aggression includes rumor spreading and deliberately excluding or socially isolating another person. Relational aggression targets an adolescent's ability to fulfill his or her need for belonging (Baumeister & Leary, 1995). A recent meta-analytic review indicated that relational aggression was perpetrated at comparable rates by male and female adolescents (Card, Stucky, Sawalani, & Little, 2008). Across studies, however, physical and verbal aggression are reported with higher frequency among male compared to female adolescents (Card et al., 2008). Despite this difference, there is a significant, moderate correlation between relational and physical and verbal aggression (Sullivan et al., 2006; Underwood, Beron, & Rosen, 2010).

In addition to classifying aggression as physical, verbal, or relational, researchers have also been interested in the motivation for aggression. Two distinct types of functions have been identified: reactive and proactive. Reactive aggression is an angry or aroused response to some type of provocation, whether real or imagined. In that case, the goal of aggression is to respond to the perceived provocation in order to remove the threat (Dodge & Coie, 1987). In contrast, proactive, or instrumental, aggression is used to achieve a desired outcome (Arsenio, Adams, & Gold, 2009). This outcome may be material (an object, a better place in line, someone else's boyfriend) or somewhat less tangible (e.g., status, power, the respect of one's peers). Proactive aggression, unlike reactive aggression, is not preceded by perceived provocation. Proactive and reactive aggression have been determined to be distinct constructs (Dodge & Coie, 1987), but there is a strong correlation between the two functions of aggression (Arsenio et al., 2009).

A third dimension along which aggression has been classified is the level of confrontation involved between the perpetrator and the victim. It is possible for aggression to be either direct (face-to-face) or indirect (perpetrated outside of the victim's presence). For example, an adolescent can hit a person in the face (direct physical aggression). That same adolescent could instead destroy that person's property (an iPod, a notebook) behind that person's back (indirect physical aggression). Typically, aggression is classified as either direct (overt) or indirect (covert). Unfortunately, most research has blurred the distinction between the form of aggression and the level of confrontation involved, considering relational aggression synonymous with indirect aggression, and physical and verbal aggression synonymous with direct aggression (e.g., Card et al., 2008). This is an

oversimplification. It is possible for physical and verbal aggression to be indirect, as in the previous example, or for relational aggression to be direct (e.g., an adolescent threatening to withdraw friendship if another person does not comply with her demands).

Types and classifications of electronic aggression. Researchers have generally treated electronic aggression as a new form of aggression, a counterpart to physical, verbal, and relational aggression (e.g., Tokunaga, 2010). However, it is possible that media may represent an additional dimension on which aggression can be classified (Mehari, Farrell, & Le, in press). Electronic aggression may simply be in-person aggression perpetrated through electronic media, instead of a new form of aggression altogether. In support of this, aggressive behavior that is perpetrated electronically can be classified along the same dimensions—form, motivation, and level of confrontation—as aggressive behavior perpetrated in person. Researchers generally include items representing physical (e.g., threatening physically), verbal (e.g., calling names), and relational (e.g., rumor spreading) forms of aggression in their measures of electronic aggression (e.g., Bauman, 2009). Electronic aggression can also be reactive or proactive, as electronically aggressive adolescents have reported that they engage in aggression for revenge (reactive) as well as for entertainment (proactive) (Raskauskas & Stoltz, 2007). In addition, electronic aggression can be either direct (calling someone mean names via text messages) or indirect (sending an embarrassing picture to other adolescents at school).

Some behaviors considered electronic aggression are counterparts of aggression perpetrated in person. Rumor spreading (also called broadcasting) involves electronically spreading true or false information about a peer that damages their image, reputation, social

status, or relationships. Adolescents can also exclude their peers from online groups or encourage others to block a particular person's electronic communication, which is similar to social exclusion or isolation perpetrated in person (Calvete et al., 2010). Flaming and trolling occur in the context of an online discussion; flaming is posting taunting or insulting messages about the subject of a discussion or web page, whereas trolling is posting hostile messages about a participant in a discussion. This is very similar to verbal aggression that can occur in person. Adolescents can also physically threaten their peers using electronic media.

On the other hand, there are also some aggressive behaviors that can be perpetrated electronically that simply cannot occur through non-electronic means (Calvete et al., 2010). Photoshopping involves altering a photo or video and distributing it electronically in order to embarrass or humiliate someone. Impersonation (also called deception or masquerading) is taking on another person's identity (sometimes by hacking) when interacting with others. It may involve changing information on a person's social networking account, or changing passwords to lock out the victim. Happy slapping refers to a situation in which adolescents physically attack a peer, sabotage a peer, or force a peer to engage in a humiliating or embarrassing behavior, video record the act, and then distribute the video electronically. Adolescents can also create web pages or fake profiles designed to humiliate a peer, or set up online polling sites that criticize and degrade their peers (Belsey).

Current classifications of aggression must thus be extended to accommodate not only form, function, and level of confrontation but also the media through which aggression is perpetrated. Aggression, in that sense, can take place in person or through electronic communication technologies. The ways that adolescents can harm their peers using electronic

media are essentially limitless, excluding physical harm, and possible aggressive behaviors will multiply as more technologies are developed. Due to the wide range of aggressive behavior that can be perpetrated electronically and the dissimilarity of those behaviors to each other, it may be counterproductive to categorize all such behaviors into a single form of aggression.

The physical, verbal, and relational forms of aggression that have already been established may effectively capture the forms of aggression perpetrated through electronic means. The electronically aggressive behaviors described previously can be separated into physical, verbal, and relational aggression. There are obvious connections that were described previously, such as rumor spreading that can be perpetrated in person or through electronic means. In other cases, conceptualizations of physical, verbal, and relational aggression may need to become more flexible in order to accommodate aggression that targets safety, dignity, relationships, and reputation, etc., but that presents itself differently. For example, online polling sites or faked social networking profiles target an individual's image and reputation, and as such, they are an electronic counterpart to in-person relational aggression. Likewise, photoshopping and impersonation target adolescents' image, reputation, and relationships. Posting videos of someone being physically attacked, on the other hand, creates an unlimited audience for physical aggression that was perpetrated in person. In that sense, it is a continuous repetition of the physical aggression.

Aggression in Adolescence

Due to the similarities between in-person aggression and electronic aggression, it is important to understand electronic aggression within the larger theoretical framework of

aggression in adolescence. Developmental changes during adolescence have a significant impact on the occurrence of aggression, making the study of aggression is particularly relevant to early adolescence. There is evidence that aggression peaks in middle school and declines in high school (e.g., DeVos & Kaffenberger, 2005). Moffitt (1993) suggested that the frequency of aggression increases by as much as tenfold during adolescence. This sharp increase may be due to the large number of changes that occur during early adolescence, including environmental changes, changes in social relationships, and developmental changes. Puberty, for example, is associated with significant changes in body size and the growth of secondary sex characteristics (Craig et al., 2001). Boys and girls also begin to interact more with each other, increasing the possibility of aggressive interactions across sexes (Craig et al., 2001).

Simultaneously occurring with the onset of adolescence is the transition from small, homogeneous elementary schools to larger, more heterogeneous, more anonymous middle schools. The larger and more anonymous setting may simultaneously negatively affect protective factors such as school climate and decrease the likelihood of punishment for aggression. In addition, this change often requires students to create new groups of friends and renegotiate social status, with much less teacher monitoring and supervision (Simmons et al., 1991). Around the same time, peers begin to play a large role in adolescents' development of their identity and sense of self. Adolescents gradually rely more heavily on their peers for social support than on their parents or family and begin to spend more time with friends (Brown, 2004; Nansel, Haynie, & Simons-Morton, 2003).

Placing theories of aggression within a developmental perspective creates a more comprehensive understanding of adolescent aggression, including purposes of and motivations for aggression, social controls against aggression, and the process of learning aggressive behavior. Major theories of aggression, such as social learning theory and social information processing, can explain the increase in aggressive behaviors during adolescence, particularly when supplemented with an understanding of adolescent development.

Social learning theory. Bandura's social learning theory explains that children learn to engage in aggression through operant conditioning as well as through observational learning (Bandura, 1973). In operant conditioning, adolescents engage in behaviors that will result in favorable outcomes or avoid aversive outcomes. Observational learning occurs when an adolescent observes someone engage in an aggressive behavior that is not punished, and then mimics that behavior or engages in similar behaviors (Bandura, 1973). When considered in the context of adolescence, social learning theory can partially explain the increase of aggression during adolescence. Specifically, the amount of time adolescents spend with friends can increase exposure to aggressive peer models. Adolescents' exposure to aggressive peer models is associated with an increase in their aggressive behavior, consistent with observational learning (e.g., Espelage, Holt, & Henkel, 2003).

Integrating moral agency into his theory, Bandura argued that people's internalization of moral standards causes them to impose self-sanctions for violations of morality (guilt, remorse, self-censure) and positive self-reactions, such as satisfaction, pride, or pleasure, for behavior that is consistent with their moral standards (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). In this way, morality both guides and deters action. One component of self-

sanctions is empathy for the victim of one's behavior. Typically, one person will perceive another as familiar, due to shared humanity. Because of the perceived similarity, people tend to have empathy for each other and have vicarious emotional reactions to others' experiences (Bandura et al., 1996). Theory of moral agency indicates that people with high empathy will be less likely to aggress due to their empathy for the victim, which would serve as a punishment for their behavior. This hypothesis has been supported in multiple studies of adolescent aggression. In a meta-analytic review, empathy was inversely associated with aggression, such that adolescents who engaged in physical, verbal, or relational aggression had lower levels of empathy than adolescents who did not (Miller & Eisenberg, 1998).

Adolescent-limited trajectory of antisocial behavior. Moffitt (1993) integrated Bandura's social learning theory with concepts from Erikson's stages of development to explain how adolescents can use aggression to meet social and developmental goals. She created a developmental taxonomy that described life-course persistent and adolescent-limited trajectories of antisocial behavior. The taxonomy identified multiple developmental factors that may contribute to the occurrence of adolescent aggression. Specifically, Moffitt (1993) pointed to the discrepancy between adolescents' newly attained biological maturity and their societal status as children, creating a maturity gap. In the past, adolescents reached biological maturity later, due to poor nutrition, and reached societal status as adults earlier. Because of modernization and the emphasis on education, adolescents cannot achieve autonomy until much after biological maturity (for example, finishing high school at age 18, buying alcohol at age 21). She conceptualized delinquency as a way to cope with this discrepancy by asserting one's autonomy (Moffitt, 1993).

Another explanation Moffitt (1993) suggested for adolescent aggression was increased association with or exposure to aggressive adolescents. She proposed that social mimicry, comparable to Bandura's observational learning, is an adaptive trait evidenced in humans and animals. Due to social mimicry, combined with increased exposure to aggressive peer models, adolescents are more likely to behave aggressively. When adolescents try an aggressive behavior, they are likely to be reinforced due to the unique context of adolescence. Specifically, using aggression may provide adolescents with power, status, and privilege among their peers. However, when adolescence comes to an end, aggressive behavior is no longer reinforced by one's peer groups, and societal consequences become severe (e.g., criminal charges). This change in contingencies accounts for the large reduction in aggressive behavior after adolescence (Moffitt, 1993).

Social goals. Both Bandura and Moffitt identified aggression as a technique adolescents use to achieve their goals. The relation of aggression to social goals has been examined across a range of studies, and draws on social learning theory as well as Erikson's stages of development. As explained previously, social groups are often disrupted in the transition to middle school. The new environment requires adolescents to re-establish social networks in order to meet their need for belonging. Aggression can be used as a tool not only to establish dominance and status within a group but to create boundaries between people within and outside a group. For example, intra-group aggression decreases after hierarchies are established within a group (Gavin & Furman, 1989). In addition, adolescents may use aggression to maintain order by punishing those who do not conform to group norms (Gavin & Furman, 1989). Antagonistic interactions directed at people outside the group, such as

sarcasm and ridicule, draws attention to people who are different and inferior, which promote a sense of identity by indicating whom one is not (Arnett, 2010).

Social intelligence has been linked to aggression, particularly relational and verbal aggression (Bjorkqvist, 2007). In an ethnically diverse sample of adolescents transitioning to middle school, social dominance goals were predictive of aggression across gender and ethnicity (Kiefer & Ryan, 2008). There is evidence that aggression does help to achieve social goals. For example, aggression, especially relational aggression, was related to peer-nominated social centrality, coolness, belonging to a higher status peer group, and higher status within that peer group in an ethnically diverse, moderate socioeconomic status (SES) sample of adolescents (Hoff, Reese-Weber, Schneider, & Stagg, 2009). Similarly, aggression in the beginning of seventh grade predicted dominance at the end of seventh grade in a predominantly European American, moderate SES sample of adolescents (Pellegrini & Long, 2002). Socially adjusted adolescents may use both aggressive and prosocial strategies to promote their own status, exert power and influence, preserve the exclusivity of their group, and maintain order (Farmer & Xie, 2007; Hoff et al., 2009).

Social information processing. Information processing theory has also been proposed to explain adolescent aggression. Broadly, information processing theory uses computer language (such as input) to explain and describe the cognitions that drive behavior (Huesmann & Reynolds, 2001). Social information processing models, which draw heavily on Piaget's theory of cognitive development, use information processing theory to identify and label the process through which adolescents make the decision to aggress. Crick and Dodge (1994) created a social information processing (SIP) model to explain the occurrence

of aggression that points to a continuous social exchange between adolescents and their environments. They identified six cognitive steps in the decision to aggress. Emotions are integrated into each stage, and there is a constant interaction with adolescents' "databases"—memory, acquired rules, and social schemas and knowledge (Crick & Dodge, 1994).

Adolescents first encode cues, both in the environment (such as people laughing) and internally (emotional arousal). Then adolescents interpret those cues, making intent attributions and evaluating past performance and what the interaction means for them and the other person. In addition to varying in their abilities to focus on key features of the situation, adolescents also differ in their ability to attend to relevant cues and to accurately interpret those cues (Boxer, Goldstein, Musher-Eizenman, Dubow, & Heretick, 2005). The hostile attribution bias refers to the idea that adolescents high in reactive aggression tend to attribute hostile intent to ambiguous provocation situations (Crick & Dodge, 1994). The model also links deficits in attention to the decision to aggress, in that some adolescents may simply have more difficulty identifying relevant cues. Finally, adolescents clarify their goals, generate possible responses, evaluate and select a response, and enact that response (Crick & Dodge, 1994).

Crick and Dodge (1996) argued that different steps of the SIP model are more closely related to different functions of aggression. For example, they suggested that proactively aggressive children evaluate aggressive responses positively as achieving goals for the situation and have high self-efficacy for enacting an aggressive response. On the other hand, reactively aggressive children demonstrate more bias in attending to cues and interpreting ambiguous stimuli (Crick & Dodge, 1996).

Arsenio and colleagues (2009) argued that there is a sociomoral component to aggression that is strongly associated with the emotions adolescents believe aggressors and victims will experience after an act of aggression. Adolescents have stronger beliefs against aggression if they believe victims experience negative emotions because of being victimized. Along the same lines, adolescents who believe aggression results in a negative emotional experience for the victim also believe that the perpetrator of aggression will have a negative emotional reaction to their own behavior (Arsenio et al., 2009), as suggested by Bandura's theory of moral agency. Arsenio and his colleagues found empirical support for the notion that moral beliefs and empathetic responses were the same for both nonaggressive adolescents and adolescents high in reactive aggression. However, moral concern and empathy were significantly lower for adolescents high in proactive aggression. They concluded that social-cognitive deficits were characteristic of reactively aggressive adolescents, and thus reactive aggression can be explained by the SIP model. However, the SIP model does not fully take into account social-cognitive biases and disruptions in moral reasoning that are characteristic of proactively aggressive adolescents, which may be better explained by social learning theory. Based on their findings, Arsenio and his colleagues (2009) concluded that proactively aggressive adolescents may make the judgment that using aggression is necessary to meet their social needs and negotiate a chaotic environment.

Three types of beliefs are linked to the perpetration of aggression: the belief that aggression is normative and acceptable, perceived effectiveness of aggression, and confidence in one's ability to engage in an aggressive response. Normative beliefs about aggression and antisocial behavior are related to physical, verbal, and relational aggression

(Marini, Dane, Bosacki, & YLC-CURA, 2006; Tapper & Boulton, 2004; Werner & Nixon, 2005), though one study found no relation between adolescents' normative beliefs about relational aggression and their perpetration of relational aggression (Werner & Grant, 2009). Some studies have suggested that normative beliefs about aggression predict subsequent aggression, but this relation may vary by age and ethnicity (Andreas & Watson, 2009; Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995; Huesmann & Guerra, 1997). There is evidence that moral reasoning is also closely tied to aggression, as suggested by both SIP models and theories of cognitive development. Interestingly, when discussing aggressive behavior, aggressive adolescents identified rules and consequences as reasons to avoid engaging in those behaviors, whereas nonaggressive adolescents identified the wrongness of the act itself. This may indicate that aggressive adolescents consider aggression to violate societal rules but not necessarily moral standards, increasing their likelihood of aggressing if they believe they can avoid negative outcomes (Harvey, Fletcher, & French, 2001; Tisak, 1995).

Belief in the effectiveness of aggression for achieving situational goals is also predictive of aggression, as suggested by both social learning theory and social information processing. Aggression is related to expecting tangible rewards for using aggression and believing that aggression will reduce negative treatment from peers (Colder, Mott, Levy, & Flay, 2004; Egan, Monson, & Perry, 1998; Perry, Perry, & Rasmussen, 1986; Takahashi, Koseki, & Shimada, 2009). This relation may be stronger for physical, verbal, and proactive aggression compared to relational and reactive aggression (Arsenio et al., 2009; Crain et al., 2005). Along with beliefs in the effectiveness of aggression, confidence in one's ability to

enact an aggressive response is significantly related to aggression. Self-efficacy for aggression has been associated with aggression in multiple studies (Arsenio et al., 2009; Egan et al., 1998; Perry et al., 1986; Quiggle, Garber, Panak, & Dodge, 1992). Beliefs are linked to aggression by both social learning theory and social information processing models.

Electronic Aggression

The classifications and theories of peer-targeted aggression previously described were developed to account for aggression that takes place in person. Rapid increases in technology have allowed adolescents to interact electronically, not only increasing opportunities for aggression but also creating different ways aggression can be perpetrated. The Pew Internet and American Life Project supported a series of surveys using a nationally representative sample of 800 adolescents (defined as 12 to 17 year olds) in the continental United States (Lenhart, Ling, Campbell, & Purcell, 2010). In 2009, 75% of 12 to 17 year olds reported owning a cell phone, and 69% reported owning a personal computer. Use of those devices has been increasing. For example, in 2008, 38% of adolescents reported texting their friends daily. In 2009, the number of adolescents reporting daily use of text messages rose to 54%. Text messaging is now the most common way that adolescents contact their friends, more than face-to-face, instant messages, and phone calls. Older female adolescents use text messaging most often, about 100 times a day. Adolescents' use of the internet is also changing, with decreased percentages of adolescents reporting that they blog, and almost 75% of adolescents reporting that they use social networking sites, typically Facebook (Lenhart et al., 2010).

Despite a growing body of research on electronic aggression, there is little consistency across studies in definitions of electronic aggression and the types of behaviors included in electronic aggression. Furthermore, there is little discussion of theoretical implications of electronic aggression or research linking theories of development and aggression to the relatively new phenomenon of electronic aggression. The lack of continuity across studies is reflected in issues such as discrepancies in the words used to label this phenomenon to more complex issues such as the range of measures used to assess electronic aggression and findings regarding the occurrence of electronic aggression and psychosocial characteristics of electronic aggressors. Following an expert panel on electronic aggression in 2006, the Centers for Disease Control and Prevention (CDC) called attention to the lack of organization and coordinated research on electronic aggression, resulting in a brief for educators and caregivers (Hertz & David-Ferdon, 2008) and a special issue of the *Journal of Adolescent Health*. However, electronic aggression research continues to be disorganized, lacking a strong and comprehensive theoretical framework that could provide much-needed structure to unify current research and guide future research and prevention in this area (Mehari et al., in press).

Unique features in the perpetration of electronic aggression. Researchers have generally assumed that electronic aggression represents a distinct form of aggression. This assumption has been based on unique features surrounding the perpetration of aggression electronically compared to perpetration in person (e.g., Tokunaga, 2010). There are some key aspects in which aggression perpetrated electronically is qualitatively different from aggression perpetrated in person. Differences in circumstances surrounding electronically-

mediated communications have important theoretical implications. Specifically, they suggest that there may be a lower threshold for engaging in electronic aggression compared to in-person aggression. In electronic communication, the perception of anonymity, lack of prosocial norms or enforced rules, and the degree of separation between adolescents and the consequences of their behavior, creates an environment that facilitates loss of inhibition and in which behavior is not regulated.

One key difference is the ease of access to electronic communication technologies. Specifically, there are no time or space limitations to electronic aggression. Adolescents can perpetrate aggression against their peers at any time and in any place (Campbell, 2005). For instance, electronic aggression can violate an adolescent's privacy to a much greater extent than aggression perpetrated in person. Some examples are video recording an adolescent while changing, bathing, or engaging in sexual activity, and forwarding private emails, instant messages, texts, or pictures to others. To a certain extent, those behaviors can be perpetrated without communication technologies. For instance, an adolescent could disclose private information that was shared with her in confidence. Adolescents can also video record or photograph an adolescent and physically show those things to other people. Unfortunately, electronic media can provide an unlimited audience for aggression (Slonje & Smith, 2008), magnifying invasions of privacy, and forcing adolescents to continually relive the humiliation. Relational aggression may have similar effect, in which an adolescent's social status, relationships, and reputation may suffer long-term damage. However, electronic aggression has a magnified potential for harm, given the rapidity with and extent to which electronic communication technologies can spread information.

Theory of aggression perpetrated electronically. Because of key differences between electronic and in-person communication and interactions, theories of in-person aggression described previously must be augmented by theories of behavior that account for the use of electronic media. This is based on a theoretical model in which in-person and electronic aggression both tap into a broader aggression construct, but in which media may partially explain differences across adolescents' perpetration of aggression (Mehari et al., in press). Research regarding psychosocial characteristics of electronic aggressors has supported the extension of social learning theory and social information processing to explain electronic aggression. However, many researchers argue that the unique circumstances surrounding electronic communication may make it easier to engage in electronic aggression (e.g., Tokunaga, 2010). Electronic communication may reduce naturally occurring barriers to aggression while providing greater reinforcement for aggression.

Gratifications sought-obtained theory of media. According to the gratifications sought-obtained theory of media, people use media to meet a variety of goals. The theory describes an iterative process in which people's expectations are modified by experience, and the experiences which people pursue change based on their expectations (Ramirez, Eastin, Chakroff, & Cicchirillo, 2008). As it applies to adolescence, the internet may change the context of adolescent tasks, particularly identity construction and intimacy (Subrahmanyam & Greenfield, 2008). Adolescents use the internet to reinforce existing relationships and explore their identity, particularly to experiment with different ways of presenting themselves (Subrahmanyam & Greenfield, 2008). There is some evidence that adolescents do explore their identity using electronic communication. In an ethnically diverse sample of Canadian

adolescents, about 33% of participants reported that they tried out different personalities online. In a study of adolescents in Taiwan, 77% reported using the internet for communication and 54% for self-expression, suggesting that adolescents use electronic media to achieve social and developmental goals (Huang & Chou, 2010). The gratifications sought-obtained theory complements Bandura's social learning theory to explain the occurrence of electronic aggression. Communication technologies may serve as additional media through which adolescents can meet their instrumental goals, including identity development (establishing who they are not) and dominance. Electronic aggression may help adolescents to meet those goals, just as in-person aggression has been linked to belonging and social dominance.

Unfortunately, no research identified in this literature review has tested the hypothesis that electronic aggression is used by adolescents to achieve instrumental social-developmental goals. Two studies asked adolescents why some adolescents were electronically aggressive. In a predominantly European American, moderate SES sample, 38% of adolescents who were electronically aggressive reported that they did it for fun; 25% reported that they did it for revenge; and 6% reported that they did it because they felt bad about themselves (Raskauskas & Stoltz, 2007). Similarly, a qualitative study based on an ethnically and socioeconomically diverse sample of adolescents used focus groups to identify reasons that adolescents gave to explain why they used electronic aggression (Smith et al., 2008). Two themes that emerged in the focus groups were a desire for control and a desire to alleviate boredom or to seek entertainment (Smith et al., 2008). These themes suggest that adolescents believe they can meet instrumental goals through electronic aggression

(entertainment, control, positive emotions). In support of this, higher use of social manipulation was associated with electronic aggression in an ethnically diverse sample of American adolescents (Sontag, Clemans, Graber, & Lyndon, 2011).

Reduced coordination of communication. Some primary concerns that have arisen in the study of electronic communication and online behavior are the reduced coordination of communication, disinhibition, and deindividuation (Kiesler et al., 1984; Subrahmanyam & Greenfield, 2008; Suler; 2004; Wade & Beran, 2011). Kiesler and colleagues (1984) pointed out that though easy access to electronic media may increase the quantity of communication, the quality of communication may suffer. They argued that nonverbal cues, such as eye contact, gestures, and facial expressions, are critical for the regulation of social exchanges. For example, when talking face-to-face, it is easy to tell from someone's facial expression whether they understand, agree or disagree with, or have positive or negative emotional reactions to what one is saying. The lack of nonverbal input leads to easy misunderstandings, offenses, and miscommunications (Kiesler et al., 1984).

The ability to see facial expressions is critical for empathy, which plays a significant role in Bandura's theory of moral agency. Developmental research has shown that children and early adolescents rely more heavily on facial expressions than on their understanding of the situation to make judgments about how people feel (e.g., Hoffner & Badzinski, 1989). With electronic aggression, it is impossible to see the victim's immediate emotional reaction (with the notable exception of video chatting technology such as Skype). Because of this, a key component of empathy is absent in electronic communication. This is troubling because of the well-established inverse relation between empathy and aggression (Miller &

Eisenberg, 1998). Empathy serves as a self-sanction for adolescents' behavior (Bandura et al., 1996), so the inability to read facial expressions may distort adolescents' perception of their moral agency and allow them to disengage from the consequences of their behavior. In addition, the lack of visible, emotional responses may have a negative effect on bystanders who observe the aggression. According to social learning theory, adolescents are likely to enact behaviors they observe unless they see those behaviors being punished (Bandura, 1973). Lack of empathy for the victim, even when adolescents are simply observing the aggression, may make it more likely for those bystanders to be aggressive in the future.

One study has linked empathy to the perpetration of electronic aggression. Ang and Goh (2010) explored the relation between empathy and electronic aggression among middle and high school students in Singapore. They distinguished between affective empathy (sharing the emotional experience) and cognitive empathy (identifying and understanding how the other person feels), and found that affective empathy, but not cognitive empathy, explained a significant amount of the variance in electronic aggression (Ang & Goh, 2010). It is possible that because of adolescents' dependence on facial cues to identify emotion, which are not present in electronic communication, cognitive empathy is not a deterrent for the commission of electronic aggression. On the other hand, the ability to experience others' emotions is less dependent on facial cues. Because of this, affective empathy may still serve as a self-sanction for aggression.

Research has not yet examined whether observing electronically aggressive behavior is associated with an increased likelihood of aggression, and whether empathy for the victim moderates that relation. Despite the lack of specific research in the area of electronic

aggression, research showing the effects of observing other aggressive behavior is relevant. For example, there are mixed findings regarding whether watching violent television is associated with increased aggressive behavior (e.g., Bjorkqvist, 2007; Huesmann, Lagerspetz, & Eron, 1984). Bjorkqvist (2007) identified empathy as a moderator across studies, such that violent television that showed pain cues of the victim or encouraged the viewer to identify with the victim were associated with less aggression. On the other hand, television in which the pain of the victim was ignored or celebrated was associated with increased occurrence of aggression (Bjorkqvist, 2007). This draws a strong parallel to electronic victimization, in which bystanders most likely do not observe pain cues of the victim. Based on the theory of observational learning and on the empirical findings regarding violent television, it is expected that observing electronic aggression without observing pain cues of the victim will result in increased aggression.

Another effect of the reduced coordination of communication is the lack of cues needed to determine the other person's intent. Encoding and interpreting situational cues and intent attributions are identified in SIP models as integral processes in the decision to aggress (Crick & Dodge, 1994). It is possible that even adolescents with unbiased attributional styles can mistake a well-intended behavior for a hostile one when interacting through electronic media. What one adolescent intended as a joking, friendly interaction can quickly become a mutually aggressive interaction if the other person interprets the comment as an insult or a threat. The lack of cues such as tone of voice and facial expression may increase the likelihood of misinterpretations and hostile attributions. Again, research has not explored adolescents' intent attributions for electronic behaviors, and whether those attributions are

different from attributions for in-person behaviors. Additionally, research has not yet examined the relation between hostile attribution bias and perpetration of electronic aggression.

Online disinhibition effect. Adolescents have greater inhibition in person than when communicating via electronic media. Suler (2004) proposed an online disinhibition effect that can result in benign or toxic behavior. On the one hand, disinhibition can lead to generosity, kindness, and a willingness to self-disclose and explore one's identity. On the other hand, disinhibition can lead to rude, harsh, and violent expressions. He identified six aspects of online communication that lead to disinhibition. First, the dissociative anonymity allows people to separate their "real life" selves from their online selves, especially because they have some degree of control over who the other person believes they are. Suler's concept of invisibility is similar to Kiesler and colleagues' (1984) reduced coordination of communication, in which even if a person's identity is known, he or she cannot see others' disapproval or indifference. Third, online communication leads to asynchronicity, in which a person does not have to immediately deal with other people's reactions. The timing is different from face-to-face interactions. There is also a minimization of status and authority. Online, everyone is fairly equal. The lack of status and authority corresponds to a decrease in inhibition. Suler also identified two distortions in perception that lead to disinhibition. The first, solipsistic interjection, is when the person with whom one interacts begins to feel like a character inside one's head. In regards to electronic aggression, it is facilitated by the degree of separation between the act of aggressing and the impact of aggressing on the victim, even with, for example, direct verbal aggression perpetrated electronically. The time and place in

which one adolescent is aggressing is different from the time and place in which the target is victimized. Essentially, the aggressor is not in the same space as the victim.

Suler (2004) also discussed dissociative imagination, in which people feel that the online world is separate from the real world, like a game with different rules, leading to disinhibition. Decreased inhibition may have a wide range of effects on behavior. In an ethnically diverse sample of middle and high school students in Canada, almost one quarter of adolescents reported that they did wild or crazy things online that they would not do in person (Cassidy, Jackson, & Brown, 2009). As suggested by Cassidy and colleagues' (2009) study, disinhibition can lead to increased impulsivity. Impulsivity has been theoretically linked to aggression in the SIP model, as well as related to aggression across multiple empirical studies (Hawkins et al., 1998). The lower levels of inhibition can increase impulsivity because adolescents do not have the same self-restraints as they do during in-person interactions. Again, though there is theoretical support for increased impulsivity and, through impulsivity, increased aggressive behavior in electronic communications, this review found only one study linking impulsivity to electronic aggression. A study using an ethnically diverse, moderate SES sample of adolescents found that electronic aggression was associated with effortful control, a proxy for impulsivity (Sontag et al., 2011). Sontag and colleagues found no difference in the level of effortful control between electronic aggressors and in-person aggressors. Though a slightly different construct, one study of Finnish adolescents found that hyperactivity was associated with electronic aggression (Sourander et al., 2010)

Social identity model of deindividuation. The social identity model of deindividuation effects (SIDE; Wade & Beran, 2011) also explains how people's behavior using electronic media may differ from their in-person behavior. The model is based on deindividuation theory, which proposes that anonymity decreases people's self-monitoring. It is possible to be anonymous when perpetrating aggression electronically (Slonje & Smith, 2008). This resembles indirect aggression in that the victim may not be sure of the aggressor's identity, but an extension in that it is possible for no one at all to be aware of the aggressor's identity. In fact, in two separate studies of American adolescents, 50% of electronic victims reported not knowing the identity of the aggressor (Kowalski & Limber, 2007; Raskauskas & Stoltz, 2007).

In situations where there are fewer identity markers, people are less likely to monitor and regulate their own behavior. In addition, they are less likely to think that they are being evaluated by others (Suler, 2004). Because of this, adolescents feel no need to manage their impression online (Ang & Goh, 2010). Anonymity makes it more likely for people to go along with the group, which means that if it is normative for a particular group to be aggressive online, an adolescent within that group or associated with that group is more likely to be aggressive online (Wade & Beran, 2011). In support of this, Dehue, Bolman, and Vollink (2008) found that about half of female adolescents and one third of male adolescents who perpetrated electronic aggression did so in groups.

Adolescents exist somewhat out of context online, decreasing their risk of natural punishments in relationships as well as punishments from authority figures. At school and in the community, adolescents have reputations, images, and relationships to protect.

Depending on the adolescent's peer culture and personal goals, aggression can either damage or promote the ability to meet his or her goals, but there is always some effect. In contrast, the minimal presence of social control online creates few limits on perpetration and decreases the likelihood of punishment. Perhaps because of this, there is a decreased risk of consequences for the perpetrator (Mishna, Saini, & Solomon, 2009). In both in-person and electronic aggression, there is a high likelihood that victims will not report the aggression to an adult (Mishna et al., 2009). Adolescents who are victimized electronically believe that telling a teacher or school personnel would at best be useless and at worst cause negative repercussions for themselves (Huang & Chou, 2010; Smith et al., 2008).

As Moffitt (1993) suggested, the relatively normative nature of aggression in adolescence increases each adolescent's likelihood of engaging in aggressive behavior. Similarly, the SIP model points to normative beliefs about aggression as an important part of an adolescent's decision to aggress. These beliefs include perception of the occurrence of aggression in one's peer group, beliefs about the appropriateness of aggression, and beliefs about the effectiveness of aggression. There is evidence that beliefs about aggression are linked to perpetration of electronic aggression. In a study of adolescents in Spain, Calvete and colleagues (2010) found that adolescents who reported beliefs justifying aggression were more likely to engage in electronic aggression. Normative beliefs about aggression were linked to electronic aggression in two studies of American adolescents (Werner, Bumpus, & Rock, 2010; Williams & Guerra, 2007). This relation was stronger for beliefs about relational aggression as compared to beliefs about physical and verbal aggression (Werner et al., 2010). Currently, no study could be found that has created a measure assessing normative beliefs

about electronic aggression, which are likely to predict electronically aggressive behaviors more accurately than normative beliefs about in-person aggression.

The increase in anonymity online and subsequent decrease in self-monitoring may promote moral disengagement. As Bandura (1996) explained in his theory of moral agency, people can inhibit self-sanctions for behavior that violates their moral standards through cognitive disengagement. The very nature of electronic communication allows adolescents to de-emphasize their personal role in aggressive interactions, avoid the consequences of their actions, and dehumanize the victim. All of these factors increase the ease with which adolescents can circumvent self-sanctions for behavior that violates their moral standards. As suggested by this theory, Bauman (2009) found that moral disengagement was associated with perpetration of electronic aggression in a rural, ethnically diverse, low SES sample of adolescents in the U.S. Along the same lines, adolescents who engaged in electronic aggression reported higher remorselessness than adolescents who did not (Sontag et al., 2011).

Assessment and Prevalence of Electronic Aggression

There is little consistency across studies in measures used to assess electronic aggression. Research has relied on poor measures with little theoretical justification or conceptual understanding of how electronic aggression fits into the broader framework of adolescent aggression (Mehari et al., in press). Many outstanding theoretical questions regarding electronic aggression can be answered with the appropriate methodology. Instead, research has focused on prevalence estimates, with few studies examining psychosocial characteristics of electronically aggressive adolescents (notable exceptions being Bauman,

2009; Calvete et al., 2010; and Sontag et al., 2011). In addition, there is little empirical or theoretical support for measures that have been used to assess electronic aggression and to estimate the prevalence of electronic aggression.

Single-item measures. About one-third of the studies identified in this review used single-item measures to assess electronic aggression, many of which simply asked how often the respondent had cyberbullied others or bullied others while online (e.g., Sourander et al., 2010). In other cases, researchers adapted the Olweus Bully/Victim Questionnaire to assess electronic aggression. Specifically, a definition of cyberbullying was provided in the measure, and then participants indicated how frequently they engaged in it (e.g., Slonje & Smith, 2008). Researchers may believe that they are effectively including the universe of interest in a single item by asking whether adolescents have "cyberbullied," and thereby removing the need for establishing construct validity (Cronbach & Meehl, 1955). However, this is likely not the case.

There are multiple problems with these single-item measures. First, the word "bullied" is non-specific, has strong negative connotations, and is open to interpretation. In a study of in-person aggression, Konishi et al. (2009) found cultural differences in responses on a measure of bullying. Because of this, it is important to understand that vague terms such as bullying are interpreted differently across adolescents (Konishi et al., 2009). Additionally, social desirability may strongly influence adolescents' responses, particularly with the heavy media coverage and vilification of "cyberbullies." In fact, Sontag and colleagues (2011) found that social desirability was significantly lower among adolescents who reported electronic aggression than among adolescents who did not. Researchers should reduce the

vagueness and negative connotation of items in order to increase the likelihood that adolescents are being open and honest in their responses. This will provide a better understanding of the occurrence of electronic aggression. Clear-cut, specific, and observable items leave less room for interpretation and increase the likelihood that researchers are measuring what they intended to measure. Using more than one item allows researchers to more effectively tap into the underlying construct of electronic aggression, which may appear in many different ways.

Multiple item measures. Researchers who have created multiple item measures have varied in their description and process of item creation, use of factor analysis, and general establishment of construct validity. Many of these researchers have not discussed the source of items, factor structure, or internal consistency of their measures (e.g., Perren, Dooley, Shaw, & Cross, 2010; Sontag et al., 2011; Ybarra & Mitchell, 2004). This is particularly true of researchers who adapted existing aggression measures or borrowed items from other measures (DeHue et al., 2008; Kowalski & Limber, 2007; Raskauskas & Stoltz, 2007; Slonje & Smith, 2008; Smith et al., 2006; Ybarra & Mitchell, 2007). Further, the majority of research studies on electronic aggression have used original measures, creating a significant inconsistency across studies in the behaviors that were assessed. This has led to mixed findings regarding the prevalence of electronic aggression and gender and age differences in perpetration of electronic aggression. This is most likely due to the combination of differences in measures (both items and time frames), the wide range of differences in samples, and variability in the year of study, which may reflect rapid changes in technology. Calvete et al. (2010) found that 44% of their sample of adolescents reported engaging in at

least one type of electronically aggressive behavior. No time frame over which the behavior occurred was specified in their measure. They included a wide range of behaviors that could be considered electronic aggression in their measure, suggesting that this is perhaps an accurate measure of the prevalence of electronic aggression among moderate to high SES, 12- to 17-year-olds in Spain. Sontag and colleagues (2011) found a similarly high prevalence of electronic aggression. In their moderate SES, ethnically diverse sample of middle school students, 37% of adolescents reported that they had teased someone in a mean way, spread rumors, or said mean things online at least once over the past year (Sontag et al., 2011).

In contrast to Calvete et al.'s (2010) and Sontag et al.'s (2011) high estimates of prevalence, other studies have estimated that between 20% and 30% of adolescents have perpetrated some type of electronic aggression. This has been found across a range of samples of adolescents in Canada (Beran & Li, 2005; Cassidy et al., 2009; Li, 2006; Wade & Beran, 2011), in Singapore (Ang & Goh, 2010), in Taiwan (Huang & Chou, 2010), and in the U.S. (Raskauskas & Stoltz, 2007; Werner et al., 2010; Ybarra & Mitchell, 2007). Time periods assessed ranged from at least once over the past year or within the current school year (Ang & Goh, 2010; Raskauskas & Stoltz, 2007; Ybarra & Mitchell, 2007) to the past 30 days (Werner et al, 2010). Other studies did not specify a time period, or used words such as "ever" (Beran & Li, 2005; Cassidy et al., 2009; Huang & Chou, 2010; Li, 2006). Approximately half of these studies assessed a range of behaviors with multiple items.

Some studies reported a lower prevalence of electronic aggression, ranging from 10% to 19%. These studies were conducted in a variety of countries, including Canada (Li, 2007), multiple locations in Europe (DeHue et al., 2008; Slonje & Smith, 2008; Smith et al., 2008;

Sourander et al., 2010), and the U.S. (Hinduja & Patchin, 2008; Kowalski & Limber, 2007; Patchin & Hinduja, 2006; Williams & Guerra, 2007; Ybarra & Mitchell, 2004). Again, time periods assessed varied significantly, ranging from once over the past year or during the current school year (DeHue et al., 2008; Ybarra & Mitchell, 2004) to the past couple of months (Kowalski & Limber, 2007; Slonje & Smith, 2008; Smith et al., 2008). Often, measures were vague about time periods or did not specify a time frame (Hinduja & Patchin, 2008; Li, 2007; Patchin & Hinduja, 2006; Williams & Guerra, 2007). All except Kowalski and Limber (2007) used the word "bullying" or "cyberbullying" in their measures, indicating that these studies may have provided underestimates of electronic aggression.

Categorical approaches to studying electronic aggression. Although many studies have used multiple-item measures to assess electronic aggression, the tendency across the electronic aggression literature is to categorize adolescents into groups of "cyberbullies." This tendency stands in contrast to traditional measurement strategies that treat aggression as a continuous variable (Card et al., 2008), but reflects an increased interest in person-centered approaches to understanding aggression. That is, there has been an increased emphasis on understanding clusters of adolescents who differ in their perpetration of aggression (e.g., Wang, Iannotti, & Luk, 2012).

Despite the value in a person-centered approach to exploring adolescent aggression, researchers have generally used theoretically and statistically unsound approaches to creating groups of "cyberbullies" and have dichotomized a continuous variable using fairly arbitrary cut-offs. Some studies classified adolescents without clearly describing the criterion they used (e.g., Erdur-Baker, 2010). Other studies used statistical approaches to create cut-offs

that might not generalize well to other samples. For example, Bauman (2009) created cut-offs using the standard deviation of her measure to create a dichotomous variable that categorized adolescents as "cyberbullies." Other studies created dichotomous variables that categorized adolescents as "cyberbullies" or electronically aggressive if they endorsed any electronically aggressive behavior with any degree of frequency (e.g., Hemphill et al., 2012; Kowalski & Limber, 2007; Li, 2007; Menesini, Nocentini, & Camodeca, 2013; Pornari & Wood, 2010; Raskauskas & Stoltz, 2007; Sticca, Ruggieri, Alsaker, & Perren, 2013; Wang, Iannotti, & Nansel, 2009; Werner et al., 2010; Ybarra & Mitchell, 2004).

The underlying assumption behind dichotomizing electronic aggression is that electronic aggression is a categorical variable, such that there are qualitative differences between adolescents who are electronically aggressive and those who are not. A further implication is that adolescents within the electronically aggressive category are fairly homogeneous, making it unnecessary to take a dimensional approach by separating out degrees of involvement in electronic aggression. However, this may result in a significant loss of information. For example, studies that have taken a dimensional approach have found significant differences in how demographic variables predict degrees of involvement in electronic aggression (e.g., Ybarra & Mitchell, 2007). This suggests that the parsimony resulting from categorical approaches may prevent the field from gaining a comprehensive understanding of electronic aggression. Further research must be done to explore whether categorical or dimensional approaches provide the best model for understanding electronic aggression. Such research would not only guide future measurement of electronic aggression but would also have intervention implications. Specifically, if adolescents can be classified

into groups that are distinguished by their use of electronic aggression, electronically aggressive adolescents should be identified and placed in selective interventions. If, on the other hand, electronic aggression is best understood as a continuous variable, with adolescents differing in the degree to which they perpetrate electronic aggression, a universal intervention program may be the most effective method of addressing the problem.

Gender differences in electronic aggression. A further remaining question in the field is whether rates of electronic aggression vary by gender. Multiple studies have identified higher prevalence of self-reported electronic aggression among male adolescents. These include samples of middle school and high school students in Canada (Li, 2006), Finland (Sourander et al., 2010), Taiwan (Huang & Chou, 2010), Turkey (Aricak et al., 2008), Singapore (Ang & Goh, 2008), and Switzerland and Australia (Perren et al., 2010). Several of these studies used the word "bullied" in their measure, which may be less socially undesirable for male compared to female adolescents. Ybarra and Mitchell (2007), whose measure did not include the word "bullied," found no gender differences in the prevalence of electronic aggression, but male adolescents were more likely to be frequent aggressors in a predominantly European American, high SES sample of adolescents. On the other hand, Calvete et al. (2010) found that there were no gender differences in frequency of perpetration overall, but that male adolescents were more likely to send sexual messages and to videorecord and post videos of peer being physical attacked or publicly humiliated.

No gender differences in the perpetration of electronic aggression were found in many studies. These studies included ethnically diverse samples of adolescents in Canada (Beran & Li, 2005; Li, 2007; Wade & Beran, 2011), two samples of adolescents in Europe

(Slonje & Smith, 2008; Smith et al., 2008), predominantly European American as well as ethnically diverse samples of middle school students in the U.S. (Bauman, 2009; Kowalski & Limber, 2007; Sontag et al., 2011; Werner et al., 2010), and an online sample (Hinduja & Patchin, 2008). Overall, findings suggested that there are no gender differences, or that if gender differences exist, male adolescents are slightly more likely to self-report perpetration of electronic aggression. Researchers continue to argue that female adolescents prefer indirect and relational forms of aggression that are easily perpetrated through electronic means (e.g., Huang & Chou, 2010), despite the fact that this is not supported and, in fact, is often contradicted by research.

Age differences in electronic aggression across adolescence. In addition to gender differences, several studies have explored age differences in electronic aggression across adolescence. There is some evidence that electronic aggression peaks in middle school and decreases in high school, comparable to the trajectory observed in other forms of aggression. In an ethnically diverse sample in the U.S., electronic aggression was higher among seventh and eighth grade students than among sixth grade students, but there was no difference between seventh and eighth grade students (Kowalski & Limber, 2007). Electronic aggression also peaked in seventh grade in an ethnically diverse sample of adolescents in Canada, and it decreased in tenth and eleventh grade (Wade & Beran, 2011). Bauman (2009) found that electronic aggression was lower in fifth grade than in sixth, seventh, or eighth grade in an ethnically diverse sample of adolescents in the U.S. In a study of adolescents in Finland, electronic aggression was more common among 12- to 15-year-olds than among 15- to 20-year-olds. Cassidy and colleagues (2009) noted that electronic aggression appeared to

be higher among 14-year-old adolescents than any other age group in their sample of Canadian middle and high school students, but did not conduct significance tests.

Because there appear to be no age differences in electronic victimization experiences across seventh and eighth grade (e.g., Kowalski & Limber, 2007), it is possible that adolescents entering middle school first become exposed to electronic aggression through victimization experiences, and then begin to perpetrate electronic aggression due to observational learning and perhaps reactive aggression. Electronic aggression may decrease through the same mechanisms by which other forms of aggression decrease: different patterns of reinforcement and punishment and an increase in conventional behavior as adolescents age (Moffitt, 1993).

Relations among Physical, Verbal, Relational, and Electronic Aggression

To date, research on electronic aggression has focused on understanding the circumstances surrounding electronic aggression, estimates of its prevalence, and the extent to which electronic aggression covaries with in-person aggression and both electronic and in-person victimization experiences. Few researchers who have studied electronic aggression have attempted to incorporate electronic aggression into a broader theoretical framework of adolescent aggression. However, many researchers have identified correlations or bidirectional relations between electronic and in-person aggression. In general, these studies assessed cyberbullying and in-person bullying, typically measured by variations of the Olweus Bully/Victim Questionnaire previously described, and adolescents were classified as bullies if they had perpetrated any bullying behavior over a specified period of time. For example, cyberbullying and in-person bullying were correlated among adolescents in Canada

(Li, 2007), Italy (Menesini et al., 2013), Spain (Casas, Del Rey, & Ortega-Ruiz, 2013), Turkey (Erdur-Baker, 2010), and the U.K. (Pornari & Wood, 2010).

Several studies have assessed the longitudinal relation between electronic and in-person aggression. For example, Low and Espelage (2013) found that nonphysical bullying (teasing, rumor-spreading, and threats) predicted changes in cyberbullying one year later among middle school students in the U.S., but bidirectional relations were not assessed. In a longitudinal study of adolescents in New Zealand, cyberbullying predicted changes in in-person bullying, and vice versa. Further, there were no differences between the predictive power for the measures, indicating bidirectional relations (José, Kljakovic, Scheib, & Notter, 2011). In contrast, Kowalski, Morgan, and Limber (2012) found a path of moderate strength from in-person bullying to cyberbullying, but a weaker path from cyberbullying to in-person bullying. However, they did not test whether these differences were significant.

Although most studies used global measures of in-person bullying and cyberbullying, it is possible that the relations between electronic aggression and in-person aggression may vary by form. Werner and colleagues (2010) created a measure of internet aggression that included verbal aggression (e.g., making rude or nasty comments) and relational aggression (e.g., encouraging others to block a certain person), and found that relational aggression, but not physical or verbal aggression, predicted internet aggression one year later. In a study that assessed multiple forms of cyberbullying (cyber forgery, cyber verbal bullying, and hiding identity) and multiple forms of in-person aggression (physical, verbal, and indirect) among high school students in Turkey, all forms of cyberbullying were correlated with all forms of in-person aggression (Cetin, Yaman, & Perker, 2011). However, variations in the strength of

the relations were not tested, so that it is unclear whether some relations (e.g., between cyber verbal bullying and verbal aggression) were more closely related than others (Cetin et al., 2011).

The literature on electronic aggression has established a strong and consistent relation between electronic aggression and physical, verbal, and relational aggression (e.g., Li, 2007). However, more research must be done to understand how electronic aggression fits into a theoretical framework of aggression. Some researchers have posited that electronic aggression is a subtype of peer-targeted aggression, based on empirical findings that the majority of adolescents classified as "cyberbullies" were also classified as "traditional bullies" (e.g., Raskauskas & Stoltz, 2007). In support of this, Smith and colleagues (2008) determined that "cyberbullies" were more likely to be "traditional bullies" but traditional bullies were not more likely to also be cyberbullies.

Statistical analysis is one potential method that can be used to test theoretical frameworks of aggression, but few studies have taken advantage of these methods. The studies that have not assumed that electronic and in-person aggression are distinct constructs have found some evidence to support a model of aggression in which multiple forms of aggression can be perpetrated through different media. One such study created an item pool for the Cyber Victim and Bullying Scale (CVBS) based on interviews, observations, focus groups, and a literature review (Cetin et al., 2011). A principal components analysis identified three factors: cyber forgery (sharing or editing photos and videos without permission or sharing unwanted sexual content) cyber verbal bullying (spreading rumors, mocking, or posting offensive comments), and hiding identity (hacking, stealing an identity,

or creating a false persona). These findings point to important differences in forms of aggression, even when the aggression is perpetrated using electronic media. Similarly, an exploratory factor analysis was conducting on a measure of involvement in cyberbullying, which included perpetration, witnessing, and victimization among adolescents in Canada. The resulting factor structure supported a distinction between verbal electronic aggression (sending mean messages or posting mean comments) and relational electronic aggression (posting embarrassing photos online) (Law, Shapka, Hymel, Olson, & Waterhouse, 2012b). In contrast, Werner and colleagues (2010) conducted a principal components analysis of their internet aggression measure, which included verbal and relational items, and found only one resulting factor. However, as there were only four items in their measure, it may have been difficult to statistically establish more than one factor. Further, the extent to which their specific items fully represented the relevant domain was also unclear.

As opposed to factor analysis, latent class analysis takes a categorical approach by placing individuals in classes based on their responses to items. Only one study identified in this literature review used latent class analysis to determine whether adolescents who engaged in cyberbullying were different from adolescents who engaged in in-person bullying. In a national survey of adolescents in sixth through tenth grade, adolescents reported their involvement in physical, verbal, relational, and cyberbullying (Wang et al., 2012). Although the other measures of bullying provided behavioral examples, the cyberbullying items simply assessed whether adolescents had bullied others using a computer, email, pictures, or cell phones. The latent class analysis revealed three classes of adolescents: one group that engaged in all forms and media of bullying behaviors; one group

that engaged in predominantly verbal bullying and social exclusion; and one group that had low involvement in all forms and media of bullying. These findings seem to indicate that distinct groups of adolescents engage in certain forms of aggression, but that adolescents are not distinguishable by the media through which they perpetrate aggression (Wang et al., 2012). Though this study was an excellent first step toward exploring a theoretical model of aggression, the lack of specificity in the cyberbullying measure leaves questions about how forms of aggression perpetrated in person relate to forms of aggression perpetrated electronically.

The Present Study

The purpose of the present study was to test competing theoretical models of adolescent aggression. As yet, there is no clear framework in the field that explains how in-person and electronic aggression are related. The present study explored how electronic aggression relates to other forms of aggression in order to establish a theoretical framework for aggression that incorporates media through which aggression can be perpetrated. The present study used both dimensional and categorical analyses to explore the question of how electronic aggression fits into peer-targeted aggression as a whole. First, the study used factor analysis to test competing models of the relations among electronic aggression, physical aggression, verbal aggression, and relational aggression. Factor analysis can provide much needed information about how electronic aggression fits into the overall structure of aggression. Specifically, the present study tested the extent to which a theoretical model that takes both form and media into account explains the relations among aggressive behaviors (Mehari et al., in press). This theoretical framework will provide a much-needed structure to

guide future research on peer aggression, as it explains how electronic aggression fits into a broader framework of aggression. The framework is based on the idea that both form and media are important dimensions to consider when studying aggression. It suggests that theories of aggression should be supplemented with theories of online behavior to understand the construct of electronic aggression.

Second, the study conducted exploratory categorical analyses to test whether there were distinct classes of adolescents who differed in their patterns of responses to items assessing aggressive behaviors. The purpose of these analyses was to determine whether adolescents can be categorized based on the form of aggression, the media through which aggression is perpetrated, or both. Finally, the dimensional and categorical models were compared to determine whether a dimensional or categorical approach is more appropriate for understanding how electronic aggression fits into a larger framework of aggression. This was examined to inform how the field should assess and analyze electronic aggression.

As explained previously, in-person aggression has been classified by motivation (reactive or proactive), by form (physical, verbal, or relational), and by level of confrontation (direct or indirect). In general, researchers do not assess the level of confrontation separately from the form of aggression (Card et al., 2008). In addition, motivation, though important for understanding the context of aggression, does not have an impact on how the aggression is carried out. Because of this, the present study focused on how physical, verbal, and relational aggression perpetrated through in-person interactions and electronic media relate to each other.

As with previous studies of electronic aggression, the current study used self-report to assess electronic aggression. Kazdin (2003) advised that using multiple sources and multiple measures to assess a construct ensures that findings are not due to the way in which the construct was measured. Specifically, relying on a monomethod approach can inflate results (e.g., Meyer et al., 2001). To address this problem, research on in-person aggression often uses peer, teacher, or parent report in addition to or in place of self-report. This may not be as effective in electronic aggression because it is less directly observable than in-person aggression. For example, as many as half of electronically victimized adolescents were not aware of the identity of the person aggressing against them (e.g., Bauman, 2009). Even if they did knew the identity of the perpetrator, one study found that 50% of victimized adolescents did not tell anyone about their experiences (Slonje & Smith, 2008). Friends were the most common confidants for victimized adolescents, followed by parents. Teachers and other school personnel were unlikely to be told about electronic victimization experiences (Huang & Chou, 2010; Slonje & Smith, 2008). This suggests that self-reported electronic aggression may be the most accurate way to assess electronic aggression.

The current study used statistical methods to further understand the nature of electronic aggression and how it relates to other peer-targeted aggressive behaviors. The current study was directed by the following aims.

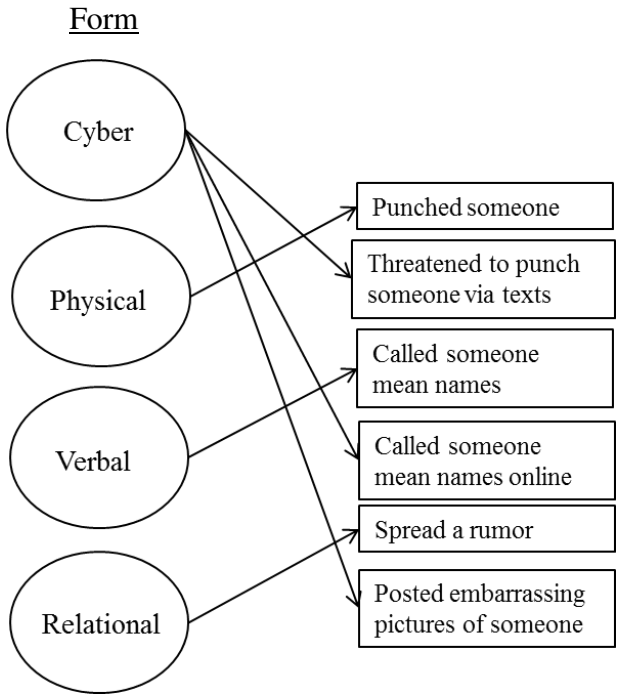
Aim 1. The present study tested competing dimensional models of aggression using confirmatory factor analysis (CFA). In the first model, form was used to explain the relations across items. In the second model, media was used to explain the relations across items. The purpose of these comparisons was to understand whether media or form provides the best

structure to understand aggression. Third, a four-factor model of aggression was tested, in which electronic aggression was treated as a new form of aggression, a counterpart to physical, verbal, and relational aggression. This is consistent with how the majority of the researchers in the field have assessed electronic aggression (see Figure 1a). In the fourth model, both form and media were used to explain the relations among aggressive behaviors. It was hypothesized that this model would provide the best fit for the data, based on a theoretical model in which form and media are two dimensions on which aggression can be classified (see Figure 1b; Mehari et al., in press).

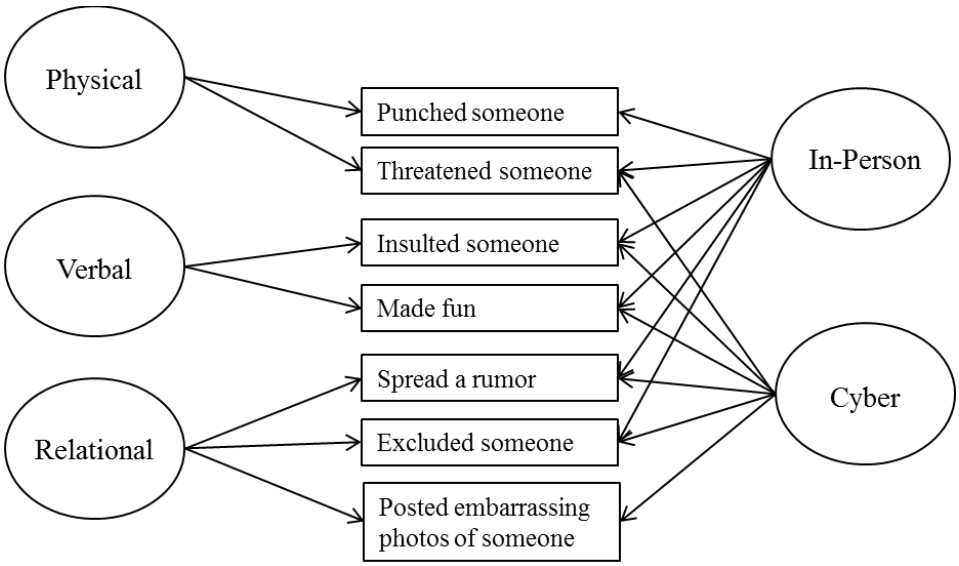
Aim 2. The present study used exploratory latent profile analyses (LPA) to identify clusters of adolescents who engage in aggressive behavior. It was hypothesized that adolescents would be clustered into classes that are differentiated by form of aggression but not by the media through which the aggression was perpetrated. This hypothesis was based on the large body of research indicating that adolescents who are electronically aggressive also engage in in-person aggression and was consistent with Wang and colleagues' (2012) findings.

Aim 3. The present study compared the models resulting from confirmatory factor analysis and latent profile analysis in order to determine which model best explains the covariance among aggressive behaviors. Comparing factor analytic and latent profile models may make it possible to identify whether a latent variable may best be represented as continuous or categorical (Lubke & Neale, 2006). In this case, it provides evidence about whether adolescents who engage in electronic aggression differ qualitatively or quantitatively from adolescents who do not engage in electronic aggression. In addition to informing a

theoretical framework of aggression, this information is useful in determining the best way to assess electronic aggression. Many researchers have treated electronic aggression as a categorical variable by establishing cut-offs to create groups of "cyberbullies." However, no study identified in this literature has empirically tested the question of whether electronic aggression is dimensional or categorical. It was hypothesized that a dimensional model would provide a better fit for the data.



(a) Including cyberbullying as an additional form of aggression.



(b) Incorporating media as an additional dimension of aggression.

Figure 1. Competing theoretical models of cyberbullying. Figure 1a displays cyberbullying as a distinct construct; Figure 1b displays media as an additional dimension of aggression (Mehari et al., in press; reprinted with permission).

Method

Participants

The current study was conducted through secondary analysis of data from a larger study evaluating the effects of a community-level, comprehensive violence prevention approach. Three high-risk communities defined by school zones in a medium-sized, southeastern city in the United States participated in the project. Demographic data describing the three participating middle schools are presented in Table 1. Each school served between 435 and 615 middle school students. Of the students attending those schools, 76% to 89% were eligible for federally-subsidized free or reduced price lunches, indicating a high concentration of low-income families. The rates of violence-related discipline incidents ranged from 37 to 40 incidents per 100 students over the course of a school year. In addition, students had rates of referrals to the Department of Justice Services as high as approximately 30%.

Table 1

Demographic Characteristics of Participating Schools and Students by Site

Characteristic	School A	School B	School C
Number of students	435	438	615
Eligible free/reduced price lunch (%)	89	80	76
African American students (%)	86	78	96
Violence-related discipline incidents (rates per 100 students)	40.2	37.7	36.6

Student referrals to the DJS[a] (rates per 1,000 students)[b]	284	284	295

Note. Data are based on the 2008-2009 school year.
[a]Department of Justice Services
[b]Estimates based on zip code.

Participants were sixth, seventh, and eighth grade students in the three participating middle schools who completed at least one wave of data during the first ten waves of the larger project (Winter 2010-Spring 2013). Participants were recruited from a random sample drawn from class rosters, such that a total of approximately 630 students from all three grades in the participating middle schools were selected in Year 1 (i.e., 2010-2011). Each participant was randomly assigned to complete surveys at two of the four waves of data collection per year in order to reduce participant burden. Participants continued to complete surveys until they left their school or declined to participate further. Beginning in Year 2, eighth grade students who transitioned to high school were replaced with a sample of approximately 210 incoming sixth grade students recruited from a random sample drawn from class rosters. Participants who left their schools for other reasons were replaced with randomly selected students from the same grade. Given the cross-sectional design of this study, only one wave of data was included for each participant. The specific wave included for each student was randomly selected, and weighting was used in order to obtain approximately equal numbers of students across grades. Data was not evenly represented across season, given that three waves of data were collected during the winter and spring, whereas only two waves were collected during the fall and summer. Furthermore, fewer students participated during the summer waves. Data for 233 participants were selected from the fall, 343 from the winter, 315 from the spring, and 161 from the summer.

Based on the requirement that students had completed the electronic aggression measure for at least one wave of data, a total of 1052 participants were included in the final sample. All grades were approximately equally represented (352 sixth grade students, 350 seventh grade students, 340 eighth grade students). The sample was evenly divided by gender (47% male). The racial composition of the sample was 76% Black or African American, 15% multiracial, 6% European American, 2% American Indian or Alaska Native, less than 1% Asian, and less than 1% Native Hawaiian or Pacific Islander. Fifteen percent of participants reported that their ethnicity was Hispanic or Latino. In terms of family structure, 27% of the sample lived in single mother homes; 24% lived in two-parent homes; 22% lived with a parent with step-parent; and 13% lived with a single mother and relative or other adult.

Procedure

Survey administration. Active parental consent and student assent were obtained from all participants. Students received a $5 gift card for returning the consent forms regardless of whether they agreed to participate and a $10 gift card after completing each survey. Surveys were administered in the fall, winter, spring, and summer of each year. During the school year, trained research staff typically administered the surveys to participants in groups of 20 or 30 in classrooms or in the media center at participating schools. During the summers, trained research staff administered the surveys to students at participating schools or in the students' homes. Surveys were completed on computers and were available only in English. Students read the survey questions on the computer screen and listened to them through audio clips spoken by both men and women of multiple ethnicities. Students could refuse to respond to any question but were prompted to re-answer

if they entered invalid responses. The computer-administered survey increased the likelihood of valid responses, skipped follow-up questions if students responded "no" to stem questions, and assisted students who may have had difficulty reading the questions. All procedures from the larger study were approved by Virginia Commonwealth University's institutional review board.

Measures

Aggression. Multiple types of aggression were assessed using the Problem Behavior Frequency Scale – Revised (PBFS; Farrell, Kung, White, & Valois, 2000), a self-reported measure assessing a range of problem behaviors. The PBFS comprised 11 subscales that measured physical, nonphysical, relational, and electronic aggression and victimization, as well as drug use, delinquency, and peer pressure for fighting. The current study used the aggression subscales. For each item, students were instructed to indicate the frequency with which they engaged in certain behaviors in the past 30 days on a 6-point scale (1 - *Never,* 2 - *1-2 times*, 3 - *3-5 times*, 4 - *6-9 times*, 5 - *10-19 times*, 6 - *20 or more times*).

The five-item physical aggression scale assessed the extent to which adolescents perpetrated or threatened to perpetrate physical aggression towards their peers. Items were based on the Center for Disease Control's Youth Risk Survey (Kolbe, Kann, & Collins, 1993). Items ranged from "Hit or slapped someone" to "Threatened someone with a weapon." The scale's internal consistency (alpha coefficient) ranged from .76 to .81 across waves (Farrell, 2013).

The five-item nonphysical aggression scale assessed the extent to which adolescents engaged in verbal or other types of nonphysical aggression. The majority of items were

developed for the original PBFS (Farrell et al., 2000). Several additional items were based on the work of Orpinas and Frankowski (2001). Examples of items include "Teased someone to make them angry" and "Put someone down to their face." The internal inconsistency ranged from .75 to .84 across waves (Farrell, 2013).

The six-item relational aggression scale was largely based on Crick and Bigbee's (1998) Social Experiences Questionnaire-Self-Report (Sullivan, Esposito, & Farrell, 2003). The scale assessed the extent to which adolescents deliberately excluded others or attempted to sabotage others' relationships and reputation. Sample items include "Spread a false rumor about someone" and "Left someone out on purpose when it was time to do an activity." The scale's internal consistency ranged from .69 to .82 across waves (Farrell, 2013).

Electronic aggression was measured using the five-item cyber-bullying scale on the PBFS, which assessed the extent to which adolescents used electronic communication technologies to harass, humiliate, or taunt others. Specifically, the items assessed adolescents' use of cell phone pictures, text messaging, and internet sites to "make fun of someone" or "threaten to hurt someone physically." Items were created by a team of researchers based on the existing literature on electronic aggression. The internal consistency ranged from .70 to .90 (Farrell, 2013).

Classification of aggression items. In order to classify each item on the aggression subscales of the PBFS according to the form of aggression and media through which it was perpetrated, ten experts were consulted. These experts were researchers at Virginia Commonwealth University who had areas of interest in aggression, victimization, and disruptive behaviors in adolescence. Each expert was asked to classify each item by form

(physical, verbal, and relational) and by media (in-person/unspecified or electronic). The percentage agreement was 99.5% for media and 88.6% for form. In cases where there was disagreement, each item was placed in the category assigned by the majority of experts, with two exceptions. Three items assessed the extent to which adolescents threatened to hurt someone physically, one item with unspecified media, one item via text-messaging, and one item via cell phone pictures. Although the unspecified media item was classified as physical aggression by the majority of raters, the text-messaging item was classified as verbal by a slight majority, and there was no consensus regarding the cell phone picture item. It was determined that as the content remained the same across items, the decision about form should not vary by media through which it was perpetrated. Because the clearest consensus for unspecified media was to classify threatening to hurt someone physically as physical aggression, the remaining two items were also classified as physical aggression.

Results

All analyses were conducted using Mplus Version 7. Full information maximum likelihood was used to address missing data. This is one of two approaches recommended by Schafer and Graham (2002) for dealing with missing data. In this dataset, the majority of missing data were missing completely at random, which is consistent with the assumptions of maximum likelihood approaches (Schafer & Graham, 2002). All items were treated as ordered categorical variables instead of interval-level scales. Each item had six response options for how often adolescents engaged in those behaviors, ranging from never to more than 20 times. Treating the items as ordered categorical accommodates the possibility that there may not be equal intervals between responses on the 6-point scale. That is, the distance

between *never* and *one to two times* may not be the same as the distance *one to two times* and *three to five times*.

Item response theory (IRT) analyses were conducted on all items assessing aggression to determine whether some response categories could be combined without a loss of information. IRT analyses include an item discrimination parameter displayed in an item characteristic curve (ICC), which can indicate whether thresholds are meaningful (Brown, 2006). Specifically, an ICC can show whether response categories tap into different levels of the latent variable. For example, examination of an ICC can indicate whether adolescents who endorse *20 or more times* have higher levels of the latent aggression variable than adolescents who endorse *10 to 19 times*. ICCs were created for each aggression item. The steepness of the slope indicates how specific a response category is to a particular degree of the latent variable. Steeper slopes indicate higher discrimination parameters, suggesting that the response category is highly specific to a particular degree of aggression (Brown, 2006). Overlapping curves indicate that there is poor discrimination between response categories, such that the response categories do not assess different degrees of the latent variable (D. Henry, personal communication, January 16, 2014). Examination of the resulting figures indicated that the first three response categories (*Never, 1-2 times,* and *3-5 times*) provided unique information. The remaining response categories (*6-9 times, 10-19 times*, and *20 or more times*) had overlapping curves, indicating that they could be merged without a loss of information. These response categories were combined for the remainder of the analyses. Figure 2 illustrates the ICC for the item "Made fun of someone to make others laugh," which is representative of all the resulting ICCs (see Figure 2).

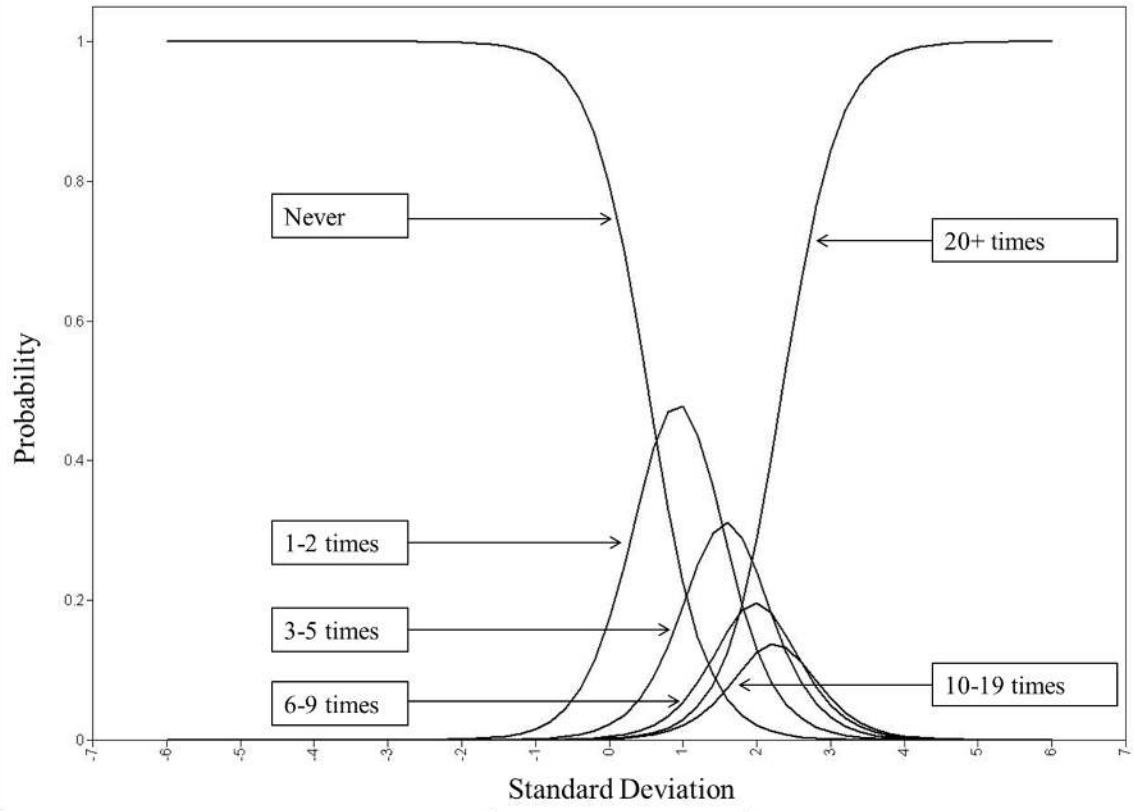


Figure 2. Item characteristic curve indicating the threshold for endorsing each response category for the item, "Made fun of someone to make others laugh."

The frequency with which participants endorsed each category for the items assessing aggression are presented in Table 2. Participants generally endorsed engaging in electronic aggression less frequently than they did for in-person aggression, with between 3% and 9% of participants reporting that they had engaged in each electronic aggression act at least once in the past 30 days. Across items, 16% of participants reported in engaging in at least one electronically aggressive behavior over the past 30 days. The most frequently endorsed electronically aggressive behavior was using cell phone pictures to make fun of someone. Across forms and media of aggression, participants were most likely to endorse yelling at someone or calling them mean names (53%), followed by hitting or slapping someone (45%). The least frequently endorsed item was an electronic aggression item, with 3% of participants reporting that they had used cell phone pictures to threaten to hurt someone physically.

Table 2.

Proportions of Participants Endorsing Each Category

Item	Never	1-2 times	3-5 times	≥6 times
In-Person/Unspecified Physical Aggression				
1. Hit or slapped someone	.55	.26	.09	.11
2. Thrown something at someone to hurt them	.80	.13	.04	.04
3. Threatened to hit or physically harm someone	.79	.13	.04	.04
4. Shoved or pushed someone	.59	.26	.08	.07
5. Threatened someone with a weapon (gun, knife, club, etc.)	.96	.03	.00	.00
In-Person/Unspecified Verbal Aggression				
6. Put someone down to their face	.79	.14	.04	.03
7. Yelled at someone or called them mean names	.47	.29	.11	.13
8. Picked on someone	.64	.22	.07	.07
9. Made fun of someone to make others laugh	.67	.20	.07	.06
10. Teased someone to make them angry				
11. Said something disrespectful to someone about their family	.83	.11	.03	.03
In-Person/Unspecified Relational Aggression				
12. Told someone you wouldn't like them unless they did what you wanted	.90	.07	.02	.01
13. Spread a false rumor about someone	.84	.12	.02	.01
14. Tried to keep others from liking another kid by saying mean things about him or her	.87	.10	.02	.01
15. Left someone out on purpose when it was time to do an activity	.85	.11	.03	.02
16. Not let someone be in your group anymore because you were mad at them	.80	.14	.03	.01
Electronic Physical Aggression				
17. Used cell phone pictures to threaten to hurt someone physically	.97	.02	.01	.01
18. Used text-messaging to threaten to hurt someone physically	.95	.03	.01	.01
Electronic Verbal Aggression				
19. Used a chat room or Internet website to make fun of someone	.94	.04	.01	.01
20. Used cell phone pictures to make fun of someone	.91	.07	.01	.02
21. Used text-messaging to make fun of someone	.95	.03	.01	.01

Confirmatory Factor Analyses

To address Aim 1, confirmatory factor analyses were conducted to test four competing models: a three-factor model in which items were loaded onto the form of aggression; a two-factor model in which items were loaded onto the media of aggression; a four-factor model in which items were loaded onto in-person physical, in-person verbal, in-person relational, and electronic aggression; and a five-factor model in which items were loaded onto in-person physical, in-person verbal, in-person relational, electronic physical, and electronic verbal aggression. Analyses were conducted using weighted least squares with mean and variance adjusted (WLSMV) models, which is the recommended approach for ordered categorical data (Wang & Wang, 2012). The overall fit of the four models was evaluated by several measures of model fit, including the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). CFI and TLI values of .95 or greater and RMSEA values of .06 or smaller indicate a good fit (Hu & Bentler, 1999). A change in CFI of greater than .01 indicates a meaningful difference (Cheung & Rensvold, 2002). Change in chi-squared values can be inflated in large samples, so changes in goodness-of-fit indices are more effective in avoiding Type 1 errors (Cheung & Rensvold, 2002). Furthermore, the chi-square value cannot be used as a basis of comparison across WLSMV models, and a chi-square difference test cannot be used for non-nested models (e.g. Mplus, 2014; Muthén, 2007). Measures of model fit for all four models are presented in Table 8.

Model 1 was a baseline model in which all items were loaded onto a single factor. The resulting model fit the data well (χ^2[189]=734.01; CFI=.958; TLI=.953; RMSEA=.052).

In Model 2, items were loaded onto form (physical, relational, or verbal). The resulting model fit the data well and was a meaningful improvement in fit over a one-factor model (χ^2[186]=585.92; CFI=.969; TLI=.965; RMSEA=.045). Factor loadings for this model are presented in Table 3. They ranged from .64 to .84 for physical aggression, from .80 to .81 for verbal aggression, and from .73 to .78 for relational aggression. The three resulting factors were highly correlated. Specifically, the correlations were .90, .79, and .86 for physical aggression with verbal aggression, physical aggression with relational aggression, and verbal aggression with relational aggression, respectively.

In Model 3, items were loaded onto media (in-person or unspecified and electronic). The resulting model also fit the data well but was not a meaningful improvement in fit from the model in which items loaded onto form (χ^2[188]= 617.45; CFI=.967; TLI=.963; RMSEA=.047). Factor loadings for this model ranged from .62 to .93 for in-person aggression and from .78 to .89 for electronic aggression (Table 3). The two factors, in-person aggression and electronic aggression, were highly correlated (0.81).

Table 3.

Standardized Parameter Estimates for Confirmatory Factor Analyses Loading Items by Form (Model 2) and by Media (Model 3)

	Model 2			Model 3	
Item	Physical	Verbal	Relational	In-Person	Electronic
Hit or slapped someone	.81	-	-	.78	-
Thrown something at someone to hurt them	.80	-	-	.77	-
Threatened to hit or physically harm someone	.78	-	-	.76	-
Shoved or pushed someone	.87	-	-	.83	-
Threatened someone with a weapon (gun, knife, club, etc.)	.64	-	-	.62	-
Put someone down to their face	-	.75	-	.73	-
Yelled at someone or called them mean names	-	.75	-	.73	-
Picked on someone	-	.81	-	.80	-
Made fun of someone to make others laugh	-	.81	-	.80	-
Teased someone to make them angry	-	.82	-	.81	-
Said something disrespectful to someone about their family	-	.73	-	.72	-
Told someone you wouldn't like them unless they did what you wanted	-	-	.74	.67	-
Spread a false rumor about someone	-	-	.74	.67	-
Tried to keep others from liking another kid by saying mean things about him or her	-	-	.73	.67	-
Left someone out on purpose when it was time to do an activity	-	-	.78	.71	-
Not let someone be in your group anymore because you were mad at them	-	-	.73	.66	-
Used cell phone pictures to threaten to hurt someone physically	.84	-	-	-	.89
Used text-messaging to threaten to hurt someone physically	.80	-	-	-	.87
Used a chat room or Internet website to make fun of someone	-	.73	-	-	.82
Used cell phone pictures to make fun of someone	-	.68	-	-	.78
Used text-messaging to make fun of someone	-	.75	-	-	.84

In Model 4, items were loaded onto four different factors: in-person physical aggression, in-person verbal aggression, in-person relational aggression, and electronic aggression. This model is characteristic of the way electronic aggression is conceptualized in the literature, as a counterpart to physical, verbal, and relational aggression. The resulting model fit the data well and was a meaningful improvement in fit compared to Models 2 and 3 (χ^2[183]=358.27; CFI=.986; TLI=.984; RMSEA=.030). Factor loadings for this model ranged from .66 to .82 for in-person physical aggression; .75 to .84 for in-person verbal aggression; .73 to .78 for in-person relational aggression; and .78 to .88 for electronic aggression (see Table 4). The correlations among factors are listed in Table 6.

In Model 5, items were loaded onto five different factors: in-person physical aggression, in-person verbal aggression, in-person relational aggression, electronic physical aggression, and electronic verbal aggression. This model provided fit the data excellently and represented a significant improvement over both Model 2 and Model 3 (χ^2[179]= 359.46; CFI=.987; TLI=.984; RMSEA=.030). Model 4 and Model 5 appeared to fit the data equally well after adjusting for degrees of freedom, as indicated by the CFI, TLI, and RMSEA. Because Model 4 is nested within Model 5, it was possible to use the DIFFTEST option in MPlus in order to compare differences in the WLSMV chi-square values across models (Muthén, 2006). This provides an estimate of a chi-square difference test comparing the least restrictive model (i.e., the five-factor model) to a model with more restrictions (i.e., the four-factor model). Results of the chi-square test for difference testing indicated that the four-factor model worsened model fit ($\Delta \chi^2$[4]=11.57, p = .02), suggesting that the five-factor model provides the best fit for the data. This finding is consistent with the hypothesis that a

model in which both media and form are taken into account provides the best explanation for the relations among aggressive behaviors.

Factor loadings for the five-factor model ranged from .66 to .88 for in-person physical aggression; .75 to .84 for in-person verbal aggression; .73 to .78 for in-personal relational aggression; .91 to .92 for electronic physical aggression; and .79 to .84 for electronic verbal aggression (Table 5). The correlations among factors are listed in Table 7. As might be expected, the lowest correlations were cross-form, cross-media (i.e., in-person physical and electronic verbal; electronic physical and in-person verbal), whereas the highest correlations were between physical and verbal aggression, within the same medium (i.e., in-person or electronic). Again, this supports the notion that both media and form are important dimensions to consider when studying adolescent aggression.

To test whether there were age or gender differences within the five-factor model, each factor was regressed on age and gender. With the exception of in-person relational aggression, there were no age or gender differences within factors. In-person physical aggression was not predicted by age (β = .02; p = .45) or gender (β = -.02; p = .11). Similarly, in-person verbal aggression was not predicted by age (β = .01; p = .74) or gender (β = -.04; p = .23). Neither electronic physical aggression nor electronic verbal aggression were predicted by age (β = .02; p = .51; β = .01; p = .88, respectively) or gender (β = -.05; p = .12; β = -.04; p = .16, respectively). Although in-person relational aggression was not predicted by age (β = -.01; p = .77), it was predicted by gender (β = -.07; p = .03). Girls reported higher frequencies of relational aggression than did boys (Cohen's d coefficient = .19). This was a small effect size based on Cohen's (1992) criteria.

Table 4.

Standardized Parameter Estimates for the Four-Factor Confirmatory Factor Analysis Model

Item	In-Person Physical	In-Person Verbal	In-Person Relational	Electronic
Hit or slapped someone	.82	-	-	-
Thrown something at someone to hurt them	.81	-	-	-
Threatened to hit or physically harm someone	.79	-	-	-
Shoved or pushed someone	.88	-	-	-
Threatened someone with a weapon (gun, knife, club, etc.)	.66	-	-	-
Put someone down to their face	-	.76	-	-
Yelled at someone or called them mean names	-	.76	-	-
Picked on someone	-	.82	-	-
Made fun of someone to make others laugh	-	.82	-	-
Teased someone to make them angry	-	.84	-	-
Said something disrespectful to someone about their family	-	.75	-	-
Told someone you wouldn't like them unless they did what you wanted	-	-	.74	-
Spread a false rumor about someone	-	-	.74	-
Tried to keep others from liking another kid by saying mean things about him or her	-	-	.73	-
Left someone out on purpose when it was time to do an activity	-	-	.78	-
Not let someone be in your group anymore because you were mad at them	-	-	.73	-
Used cell phone pictures to threaten to hurt someone physically	-	-	-	.88
Used text-messaging to threaten to hurt someone physically	-	-	-	.87
Used a chat room or Internet website to make fun of someone	-	-	-	.82
Used cell phone pictures to make fun of someone	-	-	-	.78

Used text-messaging to make fun of someone	-	-	-	.84

Table 5.

Standardized Parameter Estimates for the Five-Factor Confirmatory Factor Analysis Model

Item	In-Person Physical	In-Person Verbal	In-Person Relational	Electronic Physical	Electronic Verbal
Hit or slapped someone	.82	-	-	-	-
Thrown something at someone to hurt them	.81	-	-	-	-
Threatened to hit or physically harm someone	.79	-	-	-	-
Shoved or pushed someone	.88	-	-	-	-
Threatened someone with a weapon (gun, knife, club, etc.)	.66	-	-	-	-
Put someone down to their face		.76	-	-	-
Yelled at someone or called them mean names	-	.76	-	-	-
Picked on someone	-	.82	-		-
Made fun of someone to make others laugh	-	.82	-	-	-
Teased someone to make them angry	-	.84	-	-	-
Said something disrespectful to someone about their family	-	.75	-	-	-
Told someone you wouldn't like them unless they did what you wanted	-	-	.74	-	-
Spread a false rumor about someone	-	-	.74	-	-
Tried to keep others from liking another kid by saying mean things about him or her	-	-	.73	-	-
Left someone out on purpose when it was time to do an activity	-	-	.78	-	-
Not let someone be in your group anymore because you were mad at them	-	-	.73	-	-
Used cell phone pictures to threaten to hurt someone physically	-	-	-	.92	-
Used text-messaging to threaten to hurt someone physically	-	-	-	.91	-
Used a chat room or Internet website to make fun of someone	-	-	-	-	.82
Used cell phone pictures to make fun of someone	-	-	-	-	.79

Used text-messaging to make fun of someone	-	-	-	-	.84

Table 6.

Correlations Among Factors in Model 4(Four-Factor Model)

Factor	1.	2.	3.
1. In-person physical	-	-	-
2. In-person verbal	.90	-	-
3. In-person relational	.76	.81	-
4. Electronic	.70	.73	.87

Note. Statistics are based on models in which items are specified as ordered categorical variables.

Table 7.

Correlations Among Factors in Model 5 (Five-Factor Model)

Factor	1.	2.	3.	4.
1. In-person physical	-	-	-	-
2. In-person verbal	.90	-	-	-
3. In-person relational	.76	.81	-	-
4. Electronic physical	.73	.67	.80	-
5. Electronic verbal	.65	.75	.89	.92

Note. Statistics are based on models in which items are specified as ordered categorical variables.

Table 8.

Confirmatory Factor Analysis Fit Indices

Model	χ^2 (df)	CFI	TLI	RMSEA
CFA-1 Factor	734.01 (189)*	.958	.953	.052
CFA by Form	585.92 (186)*	.969	.965	.045
CFA by Media	617.45 (188)*	.967	.963	.047
CFA- 4 Factor	358.27 (183)*	.986	.984	.030
CFA-5 Factor	349.46 (179)*	.987	.984	.030

Note. Statistics are based on models in which items are specified as ordered categorical variables.
*$p < .001$.

Latent Profile Analyses

Latent profile analyses were used to cluster participants into classes based on patterns of responses to items representing different aggressive behaviors. Latent profile analysis is a type of mixture modeling, which is used to identify latent groups of participants. Unlike latent class analysis, which is used for binary variables, latent profile analyses are able to accommodate ordered categorical variables (Wang & Wang, 2012). Latent profile analyses were used to test a series of models, with each model specifying an increasing number of classes. The number of classes was determined based on comparing fit indices, theory, and class size considerations. Model fit was assessed using information criterion indices, specifically the Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-size adjusted Bayesian information criterion (saBIC). Of these, the BIC has been shown to perform best in determining the number of classes, so more emphasis was placed on this statistic (Nylund, Asparouhouv, & Muthén, 2007). Smaller BIC values indicate better fit (Wang & Wang, 2012). The Vuong-Lo-Mendell-Rubin (VLMR) Likelihood Ratio Test was used to determine the point at which increasing the number of classes no longer significantly improved the fit of the model. A significant VLMR likelihood ratio test indicates an improvement in fit (Wang & Wang, 2012).

The AIC, BIC, and saBIC for the latent profile models are reported in Table 9. The VLMR likelihood ratio test indicated that a two-class solution significantly improved the fit over a one-class solution (3773.70; $p < .001$). Adding a third class did not significantly improve the fit of the model according to the VLMR likelihood ratio test, indicating that two classes should be extracted (1080.31; $p = .76$). Although relative fit

indices (BIC, AIC, and saBIC) were smaller for a three-class solution than for a two-class solution, a third class did not significantly improve the fit of the model according to the VLMR likelihood ratio test. Furthermore, the three-class solution included two similar classes with low levels of aggression. Based on these results, no additional models were tested, and it was determined that a two-class model provided the best fit. The entropy for a two-class solution was .90, indicating that participants could be assigned to classes fairly well. Entropy is a measure ranging from 0 to 1 that indicates the distinctness of classes, with scores closer to 1 indicating better separated classes (Ramaswamy, De Sarbo, Reibstein, & Robinson, 1993), although there is not a good rule-of-thumb about cut-off points for entropy (Muthén, 2003; Wang & Wang, 2012).

Table 9.

Relative Model Fit Indices for Latent Profile Analyses

Model	VLMR LRT[a]	Entropy	BIC	AIC	saBIC
LPA: 2 Classes	3773.70*	.90	24659	24029	24255
LPA: 3 Classes	1080.31	.90	24024	23077	23417

Note. All fit indices are based on models in which variables were treated as continuous variables, with equal intervals between each point on the rating scale.
[a]Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.
*$p < .001$.

The profiles displayed in Figures 3 and 4 report the estimated probabilities of members in each class endorsing each item. Figure 3 depicts the probability of members in each class reporting that they had engaged in the aggressive behavior at least once over the past 30 days, and Figure 4 depicts the probability of members in each class reporting that they had engaged in the aggressive behavior three or more times over the past 30 days. Visual examination of the profiles suggested that Class 1 was characterized by low

levels of aggression (the *low aggressive* class), and Class 2 was characterized by moderate levels of aggression (the *moderately aggressive* class). Participants in the *low aggressive* class (65%; 682 participants) were somewhat likely to engage in in-person physical or verbal aggression once or twice over the past month but were unlikely to engage in relational or electronic aggression. The *moderately aggressive* class (35%; 370 participants) was characterized by high levels of physical and verbal in-person aggression, low levels of relational in-person aggression, and low levels of all forms of electronic aggression.

Posterior class probabilities from the two-class solution were used to assign participants to the class to which they had the highest probability of belonging. Multinomial logistic regressions were conducted to determine whether members of the two classes significantly differed across age and gender. There were no significant age or gender differences for class membership. Specifically, male adolescents were not more or less likely to belong to the moderately aggressive class than the low aggressive class relative to girls (odds ratio = .81; $p = .12$). Similarly, older adolescents were not more or less likely to belong to the moderately aggressive class than the low aggressive class relative to younger adolescents (odds ratio = .97; $p = .64$).

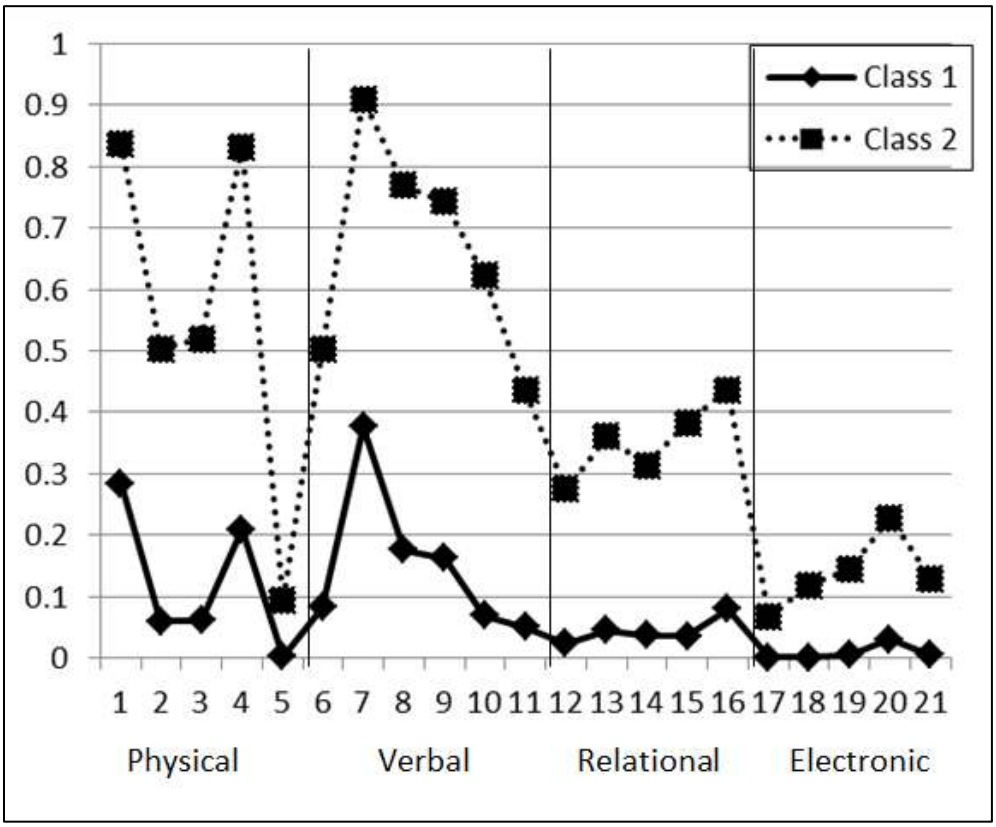


Figure 3. Latent profile analysis representing the probability of endorsing engaging in aggressive behavior one or more times for all aggression items for each class. The content of each item (1-21) is indicated in Table 2.

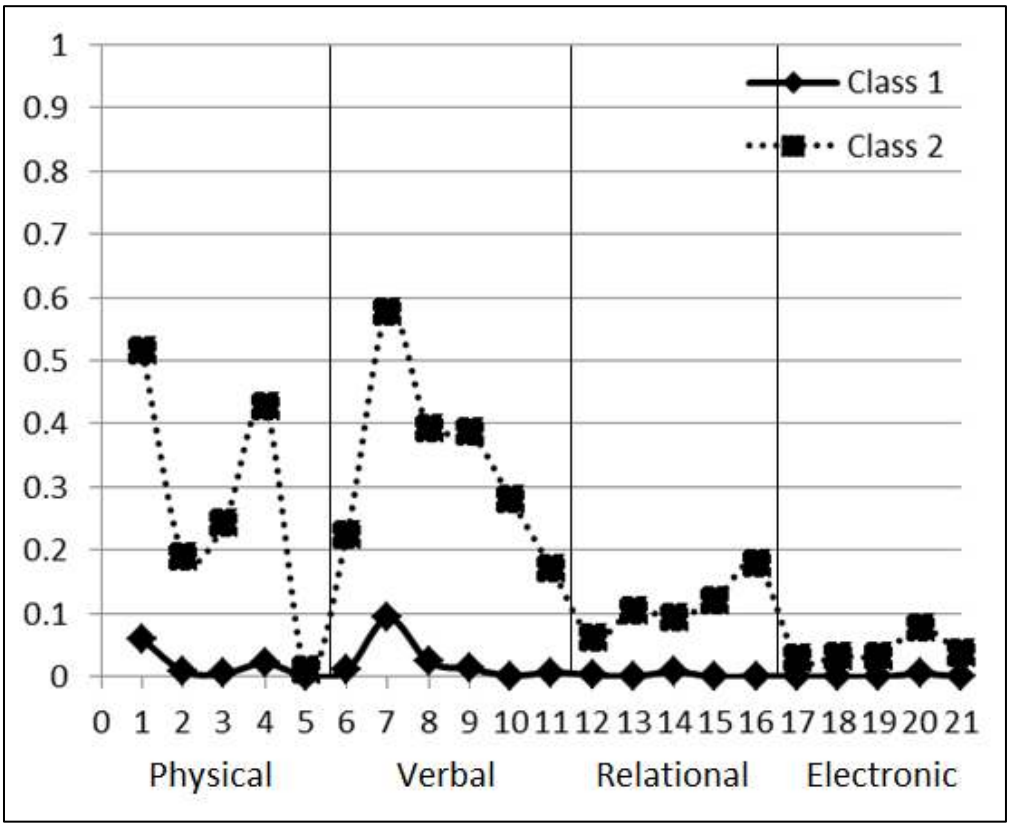


Figure 4. Latent profile analysis representing the probability of endorsing engaging in aggressive behavior 3 or more times for all aggression items for each class.

Comparison of dimensional and categorical models.

The final aim of the study was to compare the best-fitting CFA model with the best-fitting solution from the latent profile analyses. Given the previous findings, the five-factor CFA model was compared to the two-class solution from the LPA. To compare dimensional and categorical models, Lubke and Neale (2006) recommended comparing estimates of model fit including Akaike information criterion (AIC), adjusted likelihood ratio test (aLRT), and sample-size adjusted Bayesian information criterion (saBIC). Lower numbers indicated a better fit. However, these fit indicators cannot be

obtained in Mplus for confirmatory factor analyses that use categorical data. Comparisons were therefore made based on models in the data were treated as continuous to obtain these relative fit indices (Muthén, 2013). An examination of the BIC, AIC, and saBIC indicated that the five-factor model provided a better fit than the two-class solution (Table 10). This is consistent with the hypothesis a dimensional model would provide a better fit for the data. These findings suggest that a dimensional, behavior-centered model may serve as a better theoretical framework for electronic aggression than a categorical, person-centered model.

Table 10.

Comparative Model Fit Indices for Dimensional and Categorical Models

Model	CFI	TLI	RMSEA	VLMR LRT[a]	BIC	AIC	saBIC
CFA-1 Factor	.76	.73	.100	-	32861	32548	32660
CFA by Form	.79	.76	.094	-	32620	32292	32410
CFA by Media	.84	.82	.083	-	32228	31910	32024
CFA-4 Factor	.90	.89	.065	-	31716	31374	31497
CFA-5 Factor	.92	.90	.060	-	**31620**	**31258**	**31388**
LPA: 2 Classes	-	-	-	5221.52*	33896	33579	33693
LPA: 3 Classes	-	-	-	2439.34	31610	31183	31337

Note. All fit indices are based on models in which variables were treated as continuous variables, with equal intervals between each point on the rating scale.
[a]Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.
*p = .01.

Discussion

The purpose of this study was to test competing theoretical models attempting to explain how electronic aggression fits into a broader framework of aggression. First, confirmatory factor analyses were conducted to examine four competing models of aggression. It was hypothesized that the five-factor model, in which both form and media represented dimensions of aggression, would best explain the relations among aggressive

behaviors. Interestingly, models that took either media or form into account, and not both, represented relations among items quite well, with little difference in the fit across models. A four-factor model that was consistent with the dominant conceptualization of electronic aggression as a counterpart to physical, verbal, and relational aggression also represented relations among items very well. Further, it was an improvement on models that only took either media or form into account. However, a five-factor model that took both media and form into account provided the best fit for the data. This model was distinct from the four-factor model in that it differentiated among forms of aggression perpetrated electronically.

These results suggest that both media and form are important dimensions of aggression, and that accounting for one dimension in isolation will only provide a partial explanation of adolescent aggression. This study indirectly tested a model in which both media and form are dimensions for classifying aggression by creating subsets of aggression from the interactions of these dimensions (e.g., in-person physical, electronic physical, in-person verbal, electronic verbal). It was not possible to directly test this model due to the limited scope of the electronic aggression items. However, these findings provide indirect support for this theoretical model. This has important theoretical implications for understanding aggression. Specifically, researchers have tended to treat electronic media as a new "form" of aggression, that is, a counterpart to physical, verbal, and relational aggression. However, it may be more useful to conceptualize media as an additional dimension altogether, such that aggression is classified both by form (physical,

verbal, or relational) and by media (in-person or electronic) (Mehari et al., in press; see Figure 1).

The electronic aggression literature has lacked a theoretical framework to explain how electronic aggression is related to other forms of aggression. The lack of a theoretical framework is reflected in a disorganized body of literature, with discrepancies including differences in terms used to describe the phenomenon, definitions, and measures and their corresponding domains of interest. This study is a first step towards establishing a theoretical framework that can address these discrepancies. Understanding media as an additional dimension of aggression rather than electronic aggression as a new form of aggression provides a theoretical framework to guide research.

Latent profile analyses were conducted in order to explore whether adolescents would be clustered into classes that were differentiated by the media through which the aggression was perpetrated. The best fitting model indicated two classes: one group that engaged in all forms and media of aggression, and one with low involvement in aggression. These results are consistent with the latent class analyses conducted by Wang and colleagues (2012), who found three classes of adolescents. Specifically, their solution identified one group of adolescents who engaged in all forms and media of aggression, one group of adolescents who engaged in verbal bullying and social exclusion, and one group that had low involvement in aggression. That is, they found that adolescents were distinguishable by form of aggression, but they did not find a group that was characterized by the use of media to perpetrate aggression (Wang et al., 2012).

The results of this study seem to indicate that adolescents do not display clear patterns in their likelihood of using electronic compared to in-person interactions to perpetrated aggression. Instead, the classes seemed to reflect differences in the frequency of aggression rather than differences in types of behavior. The two-class solution suggests that adolescents who are perpetrating aggression use multiple forms and media to do so. This has important theoretical implications. The majority of research on electronic aggression is based on the assumption that significant qualitative differences in perpetration of electronic aggression cause a distinction in who perpetrates aggression, reflecting the notion of the "cyberbully" (e.g., Tokunaga, 2010). These qualitative differences include the factors described previously, such as ease of access to electronic media, a potentially unlimited audience, online disinhibition, reduced coordination of communication, and reduced risk of punishment. Based on these differences, researchers have conceptualized a "cyberbully" as a probably female adolescent who prefers manipulative, indirect forms of aggression (e.g., Huang & Chou, 2010). Results of the LPA in this study suggest that this is not the case. Instead, appears that the qualitative differences surrounding the perpetration of electronic aggression may not have meaningful implications for which adolescents are perpetrating aggression. Instead, the same subgroup of adolescents is engaging in all forms and media of aggression.

Overall, the confirmatory factor analysis provided a better model of adolescent aggression than did the latent profile analysis. This indicates that a dimensional, rather than a categorical, model may provide the best theoretical framework for understanding adolescent aggression. This is further supported by the class solutions produced by the

latent profile analysis, which reflected differences in frequency rather than distinct patterns of behavior. It is important to note, however, that it is possible that categories that are dimension-like may still differ qualitatively (De Boeck, Wilson, & Acton, 2005). More research should be conducted to determine definitively whether categorical or dimensional models best explain the variance in adolescents' aggression.

These preliminary findings have important implications for research. First, a large number of the studies on electronic aggression or cyberbullying identified in this review of the literature used cutoffs to determine whether adolescents belonged to categories (e.g., cyberbully, traditional bully; Kowalski et al., 2012). Although categories are convenient for classification, dichotomizing measures of aggression may not be helpful since modeling suggests that aggression is better understood as a dimensional factor. Using cut-offs forces the issue by assuming that the electronic aggression is categorical rather than dimension. Although using categories results in parsimony, the findings from this study indicate that it is important to represent adolescent aggression as a continuous variable, with adolescents differing in the degree to which they engage in aggressive behavior.

If researchers ignore the degree to which adolescents are perpetrating aggression, it is likely that information will be lost. Based on the findings of this study, researchers should take advantage of all the information available by treating aggression as a continuous variable, rather than reducing the data to categories. Despite the findings of this study, establishing thresholds in terms of risk is often useful clinically, even when the underlying factor is continuous (Markon & Krueger, 2005). In terms of prevention, it

may be useful to identify thresholds for the point at which the perpetration of electronic aggression leads to adjustment problems, and then to particularly target adolescents who display those levels of aggression.

Prevalence of Electronic Aggression

Adolescents reported perpetrating electronic aggression at a much lower rate than in-person or unspecified aggression. This is consistent with prior research that found that adolescents report lower frequencies of electronic aggression compared to in-person aggression (e.g., Sourander et al., 2010). However, it is contrary to what is generally proposed during theoretical discussions of electronic aggression (e.g., Tokunaga, 2010). In general, researchers have suggested that disinhibited behavior online and reduced coordination of communication would create a lower threshold for perpetrating aggression online than in person (e.g., Mishna et al., 2009). The low prevalence of electronic aggression in this sample suggests that what researchers consider to be significant qualitative differences may not have real-world implications for adolescents.

It is difficult to compare prevalence across measures with widely varying items and time periods assessed. The majority of studies identified in this literature review had estimates of electronic aggression that were slightly higher than those found in this study. Specifically, the majority of studies suggested that between 20% and 30% of adolescents have perpetrated some type of electronic aggression. This range has been found across a range of samples of adolescents in Canada (Beran & Li, 2005; Cassidy et al., 2009; Li, 2006; Wade & Beran, 2011), in Singapore (Ang & Goh, 2010), in Taiwan (Huang & Chou, 2010), and in the U.S. (Raskauskas & Stoltz, 2007; Werner et al., 2010; Ybarra &

Mitchell, 2007). Time periods in some studies ranged from the past year or the current school year (Ang & Goh, 2010; Raskauskas & Stoltz, 2007; Ybarra & Mitchell, 2007) to the past 30 days (Werner et al, 2010). Other studies did not specify a time period, or used words such as "ever" (Beran & Li, 2005; Cassidy et al., 2009; Huang & Chou, 2010; Li, 2006). Approximately half of these studies assessed a range of behaviors with multiple items.

Some studies identified in this literature review indicated that between 10% and 19% of adolescents engaged in electronic aggression, which is slightly lower than the prevalence rate indicated by the majority of studies. These studies were conducted in a variety of countries, including Canada (Li, 2007), multiple locations in Europe (DeHue et al., 2008; Slonje & Smith, 2008; Smith et al., 2008; Sourander et al., 2010), and the U.S. (Hinduja & Patchin, 2008; Kowalski & Limber, 2007; Patchin & Hinduja, 2006; Williams & Guerra, 2007; Ybarra & Mitchell, 2004). Again, time periods varied significantly, ranging from the past year or the current school year (DeHue et al., 2008; Ybarra & Mitchell, 2004) to the past couple of months (Kowalski & Limber, 2007; Slonje & Smith, 2008; Smith et al., 2008). Often, measures were vague about time periods or did not specify a time frame (Hinduja & Patchin, 2008; Li, 2007; Patchin & Hinduja, 2006; Williams & Guerra, 2007). All except Kowalski and Limber (2007) used the word "bullying" or "cyberbullying" in their measures, indicating that these studies may have provided underestimates of electronic aggression (e.g., Konishi et al., 2010).

A comparison of adolescents' reported prevalence in this study to the existing body of literature suggests that adolescents in this sample may be reporting a slightly

lower occurrence of electronic aggression than adolescents in the majority of previous studies. This could be true for many reasons. First, because the age range of this sample was between 11 and 15 years old, it is possible that this is a snapshot of adolescents' behavior before their higher frequency of technology use in later years. For example, adolescents ages 14-17 are more likely to access the internet using cell phones than adolescents ages 12-13 (Pew Research Internet Project, 2013).

Second, the items for the measure of electronic aggression were developed from a top-down approach, with items being generated by the researchers, rather than an approach in which items were developed from adolescents' report of their experiences. It is possible that the measure used in this study underestimates adolescents' true experiences because the measure was not asking the right questions. However, this is a problem characteristic of the literature in general. Researchers have generally taken a more theoretical approach to measure development, such as basing items on a definition (Ang & Goh, 2010; Calvete et al., 2010), a review of the literature (e.g., Aricak et al., 2008; Menesini, Nocentini, & Calussi, 2011), or expert input (e.g., Aricak et al., 2008; Wade & Beran, 2011), rather than developing items based on adolescents' reports of their experiences. However, in comparing the content of the PBFS cyber-bullying scale to other measures of electronic aggression, it appears that the PBFS scale is very limited in the extent to which it samples the domain of electronically aggressive behavior. In particular, the measure lacks relationally aggressive items such as spreading rumors online, sending or posting embarrassing pictures, and excluding others. Furthermore, the only verbally aggressive behavior included in the measure is "making fun of someone"

via different media. Other studies include items such as sending mean messages or texts, posting rude comments, and calling someone names, which may have higher prevalence rates (e.g., DeHue et al., 2008).

Another potential explanation is that the measure did not assess whether adolescents had a cell phone or access to a computer at home. Because the sample of adolescents in this study was urban, largely low-income, and predominantly African American, it is possible that there were low rates of electronic aggression due to limited access to electronic communication technologies. The term "digital divide" was first used as a term to refer to the significant gap in access to information and communication technologies that could be explained by demographics including SES and race and ethnicity. It has grown to encompass a gap in information communication technology skills and knowledge (Ritzhaupt, Liu, Dawson, & Barron, 2013). Although it appears that the gap in physical access to electronic communication technologies is closing in developed countries (van Dijk, 2006), the gap in literacy and skills is still evident and may be increasing (Ritzhaupt et al., 2013; van Dijk, 2006). The digital divide suggests that low-income adolescents and adolescents of color may be less likely to perpetrate aggression electronically due to both limited access to technology and to a gap in computer literacy and skills.

Age and gender differences across factors. Interestingly, there were no age differences in perpetration of physical or verbal electronic aggression. Previous research has mixed findings regarding age differences in electronic aggression, with some studies finding higher rates among seventh and eighth grade students (e.g., Kowalski & Limber,

2007; Wade & Beran, 2011), and others finding no differences in perpetration rates across middle school (e.g., Bauman, 2009). It is possible that age differences are dependent on item content. For example, Wade and Beran (2011) found no age differences for threatening others via electronic media, but found that seventh grade students were more likely to call people names via electronic media than were sixth grade students. All the physical electronic aggression items in this study assessed the frequency with which adolescents threatened others, so the finding that there were no age differences is consistent with previous research. For both physical and verbal electronic aggression, it is possible that the limited range of behaviors assessed and the low frequency with which adolescents perpetrated those behaviors made it difficult to detect potential age differences.

The results of analyses regarding gender differences across factors were contrary to expectations. Based on a meta-analysis of previous research, it was expected that boys would be more likely to perpetrate physical aggression and that there would be limited gender differences in the perpetration of relational aggression (Card et al., 2008). Instead, girls were more likely to perpetrate relational aggression, and there were no gender differences in the perpetration of physical aggression. One possible explanation for the discrepancy with previous research on gender differences is that this study's sample was predominantly African American. The meta-analysis conducted by Card and colleagues (2008) suggested that gender differences in the perpetration of direct physical or verbal aggression decreased when the proportion of ethnic minorities in the sample increased. Although a small effect size for gender in relation aggression perpetration was not

consistent with the finding of the meta-analysis, about half of the studies included in the meta-analysis indicated that girls were more likely to perpetrate relational aggression (Card et al., 2008).

Interestingly, there were no gender differences in the perpetration of physical or verbal electronic aggression in this sample. Previous research has had mixed findings regarding gender differences in electronic aggression. Most studies that identified gender effects suggested that boys were likely to perpetrate electronic aggression (e.g., Li, 2006). However, these findings possibly vary across items and measures. For example, Calvete and colleagues (2010) found that boys are more likely to be sexually aggressive online, but that overall boys and girls perpetrated aggression online at similar rates. It is possible that there are no gender differences in the frequency of the electronically aggressive behaviors assessed in this study (i.e., threatening, making fun of someone) but that there are gender differences in the perpetration of other electronically aggressive behaviors.

Limitations

A major limitation of this study was the use of the cyberbullying subscale of the PBFS. The cyber-bullying scale was not constructed using methodologically rigorous measure development strategies. Because of this, the items used to assess electronic aggression sampled from a restricted domain of behavior and may not have adequately sampled the restricted domain. Specifically, no relationally aggressive items were included in the cyberbullying subscale. This limited the scope of the study. To directly test the model proposed by Mehari et al. (in press) in which both media and form are dimensions of aggression, relational aggression items would need to be included. If

relationally aggressive items were included, it would have been possible to conduct multitrait-multimethod analyses in which items were loaded onto both media and form. This would have provided a direct test of the proposed model. Instead, the study was only able to indirectly test the model by creating subsets of media and form (e.g., in-person physical, electronic physical). Further, it still remains unclear how relational electronic aggression fits within a broader framework of aggression.

A major limitation of all research assessing the relations between electronic and in-person aggression is that most measures that purport to assess in-person do not specify that the aggression took place in person. In this study, the PBFS subscales for physical, nonphysical, and relational aggression do not specify that the aggression took place in person. For example, an adolescent could endorse the item, "spread false rumors about someone," if he or she spread rumors online, in person, or both. Because of this, it is not accurate to assume that the items that do not specifically mention electronic media are only assessing in-person aggressive interactions. On a related note, adolescents may find it difficult to distinguish between electronic and in-person interactions because the use of electronic media is so integrated into their daily interactions (Mehari et al., in press). If a rumor started at school, was spread online, and then further discussed at school, would adolescents identify it as electronic or in-person aggression? It is likely that line between these interactions will become increasingly blurred as technologies become even more integrated into daily life.

Another limitation of this study was that the focus was on perpetration of aggression, not victimization. It may be that a different theoretical model would best

explain the relations between form and media of victimization. It is also possible that investigating aggression without taking victimization into account ignores an important part of the bigger picture. Most adolescents who perpetrate electronic aggression are also victims of electronic aggression (e.g., Bauman, 2009; Kowalski & Limber, 2007; Patchin & Hinduja, 2006). It is likely that most electronically aggressive behavior occurs during angry, mutually aggressive interactions in which both parties perpetrate aggression and are victimized. Because of this, a theoretical framework for electronic aggression perpetration that does not include victimization may not comprehensively represent electronic aggression.

Implications

There are several important implications of this study's findings. First, this study found preliminary support for a theoretical framework in which media represents a new dimension of adolescent aggression. This theoretical framework is a good first step towards creating a common understanding of how electronic aggression fits into adolescent aggression in general. This common understanding can inform definitions of electronic aggression and guide measure development through specifying the domain of interest. It can also assist in organizing previous research as well as guiding future research in the area of electronic aggression. For example, instead of working to establish a new definition of electronic aggression, researchers can use existing definitions of peer-targeted adolescent aggression while specifying that aggressive behavior can occur in person or through electronic communication technologies.

Similarly, there is a large body of research focused on identifying psychosocial predictors of adolescent aggression. Identifying malleable psychosocial predictors of aggression is an important part of prevention science. With a theoretical framework that places electronic aggression within adolescent aggression as a whole, researchers have a solid starting point for exploring psychosocial predictors of electronic aggression. Specifically, researchers can test whether psychosocial factors that predict broader measures of aggression also predict electronic aggression. There is some evidence that psychosocial factors such as empathy, impulsivity and risk taking, and normative beliefs about aggression are associated with electronic aggression (e.g., Ang & Goh, 2010; Calvete et al., 2010; Heirman & Walrave, 2012; Nicol & Fleming, 2010; Sontag et al., 2011; Werner et al., 2010; Williams & Guerra, 2007). These findings emphasize the close relation between aggression perpetrated electronically and in person. However, media, as a dimension for the perpetration of aggression, may have some situation-specific risk factors.

Along the same lines, a theoretical framework in which media serves as an additional dimension of aggression has implications for exploring the consequences of electronic aggression. Given the lower level of social control exerted online, the potential for anonymity, and possibly a higher level of social acceptability of electronic aggression, it is possible that there are fewer social consequences (e.g., rejection, victimization) when adolescents perpetrate aggression electronically compared to in person. On the other hand, it is possible that there are no differences between outcomes associated with in-person and electronic aggression.

Second, this study indicates that aggression is best understood as a dimensional, rather than a categorical, variable. This stands in stark contrast to the large body of research that tends to treat electronic aggression as a categorical variable by placing adolescents into groups of "cyberbullies" through the use of cut-offs (e.g., Hemphill et al., 2012; Kowalski & Limber, 2007; Li, 2007; Menesini et al., 2013; Pornari & Wood, 2010; Raskauskas & Stoltz, 2007; Sticca et al., 2013; Wang et al., 2009; Werner et al., 2010; Ybarra & Mitchell, 2004). Researchers should conceptualize electronic aggression as a continuous variable, with adolescents varying in the degree to which they engage in it. Using this approach will allow a more accurate understanding of electronic aggression, its predictors, and its outcomes.

Taken together, understanding media as a dimension of aggression and understanding electronic aggression as a continuous variable have important implications for prevention programs. This study did not find a subgroup of adolescents who were characterized by their perpetration of electronic aggression. If subgroup differences had been identified, a selective intervention focused on the electronically aggressive subgroup would have been indicated. Instead, adolescents varied in the extent to which they perpetrated electronic aggression, rather than in whether or not they perpetrated electronic aggression. Given that electronic aggression appears to be best understood as a continuous factor, a universal intervention is most appropriate. Interventions that target electronic aggression will likely be most effective if they are administered to all adolescents rather than to select groups. Furthermore, understanding media as a dimension of aggression suggests that prevention programs that target aggression more

generally may also reduce electronic aggression. These prevention programs, however, may benefit from addressing risk factors that may be specific to the media of aggression, such as normative beliefs about electronic aggression, presence of a computer in adolescents' bedrooms, and parental monitoring of online activities (e.g., Heirman & Walrave, 2012; Law, Shapka, & Olson, 2010; Law, Shapka, Domene, & Gagné, 2012a).

Future Directions

A vital goal for future research in the field of electronic aggression is to create a gold standard measure of aggression (e.g., Hertz & David-Ferdon, 2007). A qualitative approach, in which adolescents describe their experiences with electronic aggression, would most likely result in a strong item pool that samples a wide domain of behavior. This item pool can be evaluated for the extent to which the items meet a definition of electronic aggression within a theoretical framework of adolescent aggression. For example, is the behavior aggression, rather than simply disinhibited behavior? Do the items effectively assess physical, verbal, and relational forms of aggression? This approach would most likely be reflective of adolescents' real-life experiences while ensuring that the measure is theoretically sound (Mehari et al., in press). Having a strong measure of electronic aggression would greatly benefit the literature. First, it will create more accurate prevalence estimates for the variety of ways in which adolescents engage in electronic aggression. Second, assessing a wider variety of electronically aggressive behaviors would have made it possible to conduct a more comprehensive test of how electronic aggression fits into a broader framework of aggression. Third, it will allow research to move forward in terms of establishing psychosocial predictors of and

protective factors against electronic aggression perpetration as well as assessing outcomes of perpetration.

This study was intended as a somewhat basic study aimed at testing models to explore the relations between forms and media of adolescent aggression. The approach taken in this study was to test competing measurement models. This study indicated that an initial theoretical framework in which aggressive behaviors are classified by both form and media is most effective in explaining the relations among aggressive behaviors. Future research should continue to test measurement models as well as test this theoretical framework in other ways. For example, if media represents a new dimension of aggression, then it electronic aggression should share psychosocial predictors with in-person aggression. As an additional dimension of aggression, cyberbullying may have some unique situational predictors as well.

There is emerging evidence that whereas in-person and electronic aggression share psychosocial predictors at the individual-, family-, and school-level, there may be differences in situational predictors (Mehari et al., in press). For example, the presence of a computer in one's bedroom increases the likelihood that an adolescent will perpetrate aggression electronically, just as the presence of a weapon increases the risk that an adolescent will perpetrate physical aggression in person (Law et al., 2010; Hawkins, 1998). These findings emphasize that although in-person and electronic aggression may largely share predictors, there may be risk and protective factors specific to the medium of aggression. Along the same lines, it is possible that electronic and in-person aggression differ in the extent to which they predict adjustment problems. However, this study did

not explore whether electronic and in-person aggression can be differentiated by predictors or outcomes, although these questions have clear clinical implications. Future research should explore these questions, with a specific focus on malleable predictors that can be targeted to reduce perpetration of electronic aggression.

Finally, the focus of this study was on perpetration of electronic aggression, not victimization, even though these phenomena are closely related. Future research should test competing categorical and dimensional models of adolescent aggression, including both aggression and victimization items. The results of that study would have important implications for our theoretical understanding of aggression and victimization in adolescence.

List of References

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Ang, R.P., & Goh, D.H. (2010). Cyberbullying among adolescents: The role of affective and cognitive empathy, and gender. *Child Psychiatry and Human Development, 41*, 387-397. doi: 10.1007/s10578-010-0176-3

Aricak, T., Siyahhan, S., Uzunhasanoglu, A., Saribeyoglu, S., Ciplak, S., Yilmaz, N., & Memmedov, C. (2008). Cyberbullying in Turkish adolescents. *CyberPsychology and Behavior, 11*, 253-261. doi: 10.1089/cpb.2007.0016

Arnett, J. J. (2010). *Adolescence and emerging adulthood: A cultural approach* (4th ed.). Boston: Prentice Hall.

Arsenio, W. F., Adams, E., Gold, J. (2009). Social information processing, moral reasoning, and emotion attributions: Relations with adolescents' reactive and proactive aggression. *Child Development, 80*, 1739-1755.

Bauman, S. (2009). Cyberbullying in a rural intermediate school: An exploratory study. *Journal of Early Adolescence, 30*, 803-833. doi: 10.1177/0272431609350927

Baumeister, R.F., & Leary, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.

Bandura, A. (1973). *Aggression: A social learning analysis*. Oxford, England: Prentice-Hall.

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology*, 71, 364-374.

Belsey, B. (n.d.). Cyberbullying.org. Retrieved from http://www.cyberbullying.org

Beran, T. & Li, Q. (2005). Cyber-harassment: A study of a new method for an old behavior. *Journal of Educational Computing Research, 32*, 265-277.

Bjorkqvist, K. (2007). Empathy, social intelligence and aggression in adolescent boys and girls. In T. F. D. Farrow & P. W. R. Woodruff (Eds.), *Empathy in mental illness*, 76-88. New York, NY: Cambridge UP.

Boxer, P., Goldstein, S.E., Musher-Eizenman, D., Dubow, E.F., & Heretick, D. (2005). Developmental issues in school-based aggression prevention from a social-cognitive perspective. *The Journal of Primary Prevention, 26*, 383-400. doi: 10.1007/s10935-005-0005-9

Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed.; 363-394). Hoboken, NJ: John Wiley & Sons.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York, NY: Guilford Press.

Bukowski, W.M., & Sippola, L.K. (2001). Groups, individuals, and victimization: A view of the peer system. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (355-377). New York: Guilford, 2001.

Calvete, E., Orue, I., Estevez, A., Villardón, L., & Padilla, P. (2010). Cyberbullying in adolescence: Modalities and aggressors' profiles. *Computers in Human Behavior, 26*, 1128-1135. doi: 10.1016/j.chb.2010.03.017

Campbell, M. A. (2005). Cyberbullying: An old problem in a new guise? *Australian Journal of Guidance & Counseling, 15*, 68-76.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*, 1185-1229.

Casas, J. A., Del Rey, R., & Ortega-Ruiz, R. (2013). Bullying and cyberbullying: Convergent and divergent predictor variables. *Computers in Human Behavior, 29*, 580-587. doi: 10.1016/j.chb.2012.11.015

Cassidy, W., Jackson, M., & Brown, K. N. (2009). Sticks and stones can break my bones, but how can pixels hurt me?: Students' experiences with cyber-bullying. *School Psychology International, 30,* 383-402. doi: 10.1177/0143034309106948

Cetin, B., Yaman, E., & Perker, A. (2011). Cyber victim and bullying scale: A study of validity and reliability. *Computers & Education, 57*, 2261-2271. doi:10.1016/j.compedu.2011.06.014

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*, 233-255. doi:10.1207/S15328007SEM0902

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Colder, C.R. Mott, J., Levy, S., & Flay, B. The relation of perceived neighborhood danger to childhood aggression: A test of mediating mechanisms. *American Journal of Community Psychology, 28*, 83-103. doi: 0091-0562/00/0200-0083

Cook, C. R., Williams, K. R., Guerra, N. G., Kim,, T. E., & Sadek, S. (2010). Predictors of bullying and victimization in childhood and adolescence: A meta-analytic investigation. *School Psychology Quarterly, 25*, 65-83.

Craig, W., Pepler, D., Connolly, J., & Henderson, K. (2001). Developmental context of peer harassment in early adolescence. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (242-264).New York: Guilford, 2001.

Crain, M. M., Finch, C. M., & Foster, S. M. (2005). The relevance of the social information processing model for understanding relational aggression in girls. *Merrill-Palmer Quarterly, 51*, 213-249.

Crick, N.R., & Bigbee, M.A. (1998). Relational and overt forms of peer victimization: A multi-informant approach. *Journal of Consulting and Clinical Psychology, 66*, 337-347.

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74-101.

Crick, N. R., & Dodge, K. A. (1996). Social information processing mechanisms in reactive and proactive aggression. *Child Development, 67,* 993.-1002.

Crick, N.R., & Grotpeter, J.K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710-722.

Crick, N.R., Grotpeter, J.K., & Bigbee, M.A. (2002). Relationally and physically aggressive children's intent attributions and feelings of distress for relational and instrumental peer provocations. *Child Development, 73*, 1134-1142.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302.

De Boeck, P., Wilson, M., & Acton, G. S. (2005). A conceptual and psychometric framework for distinguishing categories and dimensions. *Psychological Review, 112,* 129-158. doi: 10.1037/0033-295X.112.1.129

DeHue, F., Bolman, C., & Vollink, T. (2008). Cyberbullying: Youngsters' experiences and parental perceptions. *CyberPsychology and Behavior, 11*, 217-223. doi: 10.1089/cpb.2007.0008

DeVos, J. F., & Kaffenberger, S. (2005). *Student reports of bullying: Results from the 2001 school crime supplement to the National Crime Victimization Survey* (NCES 2005–310). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office. Retrieved March 15, 2010. <http://nces.ed.gov/pubs2005/2005310.pdf>.

Dodge, K. A., & Coie, J. D. (1987). Social information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53*, 1146-1148.

Egan, S.K., Monson, T.C., & Perry, D.G. (1998). Social-cognitive influences on change in aggression over time. *Developmental Psychology, 34*, 996-1006.

Erdur-Baker, O. (2010). Cyberbullying and its correlation to traditional bullying, gender and frequent and risky usage of internet-mediated communication tools. *New Media & Society, 12*, 109-125. doi: 10.1177/1461444809341260

Espelage, D. L., Holt, M. K., & Henkel, R. R. (2003). Examination of peer-group contextual effects on aggression during early adolescence. *Child Development, 74*, 205-220. doi:10.1111/1467-8624.00531

Farmer, T. W., & Xie, H. (2007). Aggression and school social dynamics: The good, the bad, and the ordinary. *Journal of School Psychology, 45*, 461-478. doi: 10.1016/j.jsp.2007.06.008

Farrell, A. D. (2013). *ACE III survey of middle school youth: Data codebook*. Unpublished manual, Virginia Commonwealth University, Richmond, VA.

Farrell, A. D., Kung, E. M., White, K. S., & Valois, R. (2000). The structure of self- reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology, 29*, 282-292.

Gastic, B. (2008). School truancy and the disciplinary problems of bullying victims. *Educational Review, 60*, 391-404. doi:10.1080/00131910802393423

Gavin, L. A., & Furman, W. (1989). Age differences in adolescents' perceptions of their peer groups. *Developmental Psychology, 25*, 827-834.

Guerra, N. G., Huesmann, N. R., Tolan, P. H., Van Acker, R., & Eron, L. D. (1995). Stressful events and individual beliefs as correlates of economic disadvantage and aggression among urban children. *Journal of Counseling and Clinical Psychology, 63*, 518-528.

Hartung, C. M., McCarthy, D. M., Milich, R., & Martin, C. A. (2005). Parent-adolescent agreement on disruptive behavior symptoms: A multitrait-multimethod model. *Journal of Psychopathology and Behavioral Assessment, 27*, 159-168. doi: 10.1007/s10862-005-0632-8

Harvey, R. J., Fletcher, J., & French, D. J. (2001). Social reasoning: A source of influence on aggression. *Clinical Psychology Review, 21*, 447-469.

Hawkins, J. S. K., & Boulton, M. J. (2000). Twenty years' research on peer victimization and adjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry, 41*, 442-455.

Hawkins, J.D., Herrenkohl, T., Farrington, D.P., Brewer, D., Catalano, R.F., & Harachi, T.W. (1998). A review of predictors of youth violence. In R. Loeber & D. P. Farrington (Eds.), *Serious and Violent Juvenile Offenders: Risk factors and successful interventions.* Thousand Oaks, CA: Sage, 106-146.

Heirman, W., & Walrave, M. (2012). Predicting adolescent perpetration in cyberbullying: An application of the theory of planned behavior. *Psicothema, 24*, 614-620.

Hemphill, S. A., Kotevski, A., Tollit, M., Smith, R., Herrenkohl, T. I., Toumbourou, J. W., & Catalano, R. F. (2012). Longitudinal predictors of cyber and traditional bullying perpetration in Australian secondary students. *Journal of Adolescent Health, 51*, 59-65. doi: 10.1016/j.jadohealth.2011.11.019

Hertz, M. F., & David-Ferdon, C. (2008). Electronic media and youth violence: A CDC issue brief for educators and caregivers. Atlanta, GA: Centers for Disease Control.

Hinduja, S. & Patchin, J. W. (2008). Cyberbullying: An exploratory analysis of factors related to offending and victimization. *Deviant Behavior, 29*, 129-156. doi: 10.1080/01639620701457816

Hoff, K. E., Reese-Weber, M., Schneider, W. J, & Stagg, J. W. (2009). The associations between high-status positions and aggressive behavior in adolescence. *Journal of School Psychology, 47*, 395-426.

Hoffner, C., & Badzinksi, D. M. (1989). Children's integration of facial and situational cues to emotion. *Child Development, 60*, 411-422.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1-55. doi: 10.1080/10705519909540118

Huang, Y., & Chou, C. (2010). An analysis of multiple factors of cyberbullying among junior high school students in Taiwan. *Computers and Human Behavior, 26*, 1581-1590. doi:10.1016/j.chb.2010.06.005

Huesmann, L. R., & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology, 72*, 408-419.

Huesmann, L. R., Lagerspetz, K., & Eron, L. D. (1984). Intervening variables in the TV violence-aggression relation: Evidence from two countries. *Developmental Psychology, 20*, 746-775.

Huesmann, L. R., & Reynolds, M. A. (2001). Cognitive processes and the development of aggression. In A. C. Bohart & D. J. Stipek (Eds.), *Constructive and destructive behavior: Implications for family, school, and society* (pp. 249-269). Washington, DC: American Psychological Association.

José, P. E., Kljakovic, M., Scheib, E., & Notter, O. (2011). The joint development of traditional bullying and victimization with cyber bullying and victimization in adolescence. *Journal of Research on Adolescence, 22*, 301-309. doi: 10.1111/j.1532-7795.2011.00764.x

Juvonen, J., & Graham, S. (2001). Preface. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized*. New York: Guilford, 2001. xiii-xvi.

Kazdin, A.E. (2003). *Research design in clinical psychology*, 4th edition. Boston, MA: Allyn & Bacon.

Kiefer, S. M., & Ryan, A. M. (2008). Striving for social dominance over peers: Implications for academic adjustment during early adolescence. *Journal of Educational Psychology, 100*, 417-428. doi: 10.1037/0022-0663.100.2.417

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist, 39*, 1123-1134.

Kolbe, L.D., Kann, L., & Collins, J.L. (1993). Overview of the Youth Risk Behavior Surveillance System. *Public Health Reports, 108*(Supp. 1), 2-10.

Konishi, C., Hymel, S., Zumbo, B.D., Li, Z., Taki, M., Slee, P., Pepler, D., Sim, H., Craig, W., Swearer, S., & Kwak, K. (2009). Investigating the comparability of a self-report

measure of childhood bullying across countries. *Canadian Journal of School Psychology, 24*, 82-93. doi: 10.1177/0829573509331614

Kowalski, R.M., & Limber, S.P. (2007). Electronic bullying among middle school students. *Journal of Adolescent Health, 41*, S22-S30.

Kowalski, R. M., Morgan, C. A., & Limber, S. P. (2012). Traditional bullying as a potential warning sign of cyberbullying. *School Psychology International, 33*, 505-519. doi: 10.1177/0143034312445244

Law, D. M., Shapka, J. D., & Olson, B. F. (2010). To control or not to control?: Parenting behaviors and adolescent online aggression. *Computers in Human Behavior, 26*, 1651-1656. doi:10.1016/j.chb.2010.06.013

Law, D. M., Shapka, J. D., Domene, J. F, & Gagné, M. H. (2012a). Are Cyberbullies really bullies?: An investigation of reactive and proactive online aggression. *Computers in Human Behavior, 28*, 664-672. doi:10.1016/j.chb.2011.11.013

Law, D. M., Shapka, J. D., Hymel, S., Olson, B. F., & Waterhouse, T. (2012b). The changing face of bullying: An empirical comparison between traditional and internet bullying and victimization. *Computers in Human Behavior, 28*, 226-232. doi:10.1016/j.chb.2011.09.004

Lenhart, A., Ling, R., Campbell, S., & Purcell, K. (2010). Trend data for teens. Pew Internet and American Life Project. Retrieved from http://pewinternet.org/Trend-Data-for-Teens

Li, Q. (2006). Cyberbullying in schools: A research of gender differences. *School Psychology International, 27*, 157-170. doi: 10.1177/0143034306064547

Li, Q. (2007). New bottle but old wine: A research of cyberbullying in schools. *Computers in Human Behavior, 23*, 1777-1791. doi: 10.1016/j.chb.2005.10.005

Low, S., & Espelage, D. (2013). Differentiating cyber bullying perpetration from non-physical bullying: Commonalities across race, individual, and family predictors. *Psychology of Violence, 3*, 39-52. doi: 10.1037/a0030308

Lubke, G., & Neale, M. C. (2006). Distinguishing between latent classes and continuous factors: Resolution by maximum likelihood? *Multivariate Behavioral Research, 41*, 499-432. doi: 10.1207/s15327906mbr4104_4

Marini, Z. A., Dane, A. V., Bosacki, S. L., & YLC-CURA. (2006). Direct and indirect bully victims: Differential psychosocial risk factors associated with adolescents involved in bullying and victimization. *Aggressive Behavior, 32*, 551-569.

Markon, K. E., & Krueger, R. F. (2005). Categorical and continuous models of liability to externalizing disorders: A direct comparison in NESARC. *Archives of General Psychiatry, 62,* 1352-1359. doi: 10.1001/archpsyc.62.12.1352

Martin, K.M., & Huebner, E.S. (2007). Peer victimization and prosocial experiences and emotional well being of middle school students. *Psychology in the Schools, 44*, 199-207. doi: 10.1002/pits.20216

Mehari, K. R., Farrell, A. D., & Le, A. H. (In press). Cyberbullying among adolescents: Measures in search of a construct. *Psychology of Violence.*

Menesini, E., Nocentini, A., & Calussi, P. (2011). The measurement of cyberbullying: Dimensional structure and relative item severity and discrimination. *CyberPsychology, Behavior, and Social Networking, 14*, 267-274. doi: 10.1089/cyber.2010.0002

Menesini, E., Nocentini, A., & Camodeca, M. (2013). Morality, values, traditional bullying, and cyberbullying in adolescence. *British Journal of Developmental Psychology*, *31*, 1-14. doi: 10.1111/j.2044-835X.2011.02066.x

Meyer, G. J., Finn, S. E., Eyde, L. D., Kay, G. G., Moreland, K. L., Dies, R. R., Eisman, E. J., Kubiszyn, T. W., & Reed, G. M.. (2001). Psychological testing and psychological assessment: A review of evidence and issues. *American Psychologist, 56,* 128–165.

Miller, P. A., & Eisenberg, N. (1998). The relation of empathy to aggression and externalizing/antisocial behavior. *Psychological Bulletin, 103*, 324-344.

Miller-Johnson, S., Sullivan, T. N., & Simon, R. R. & the MVPP. (2004). Evaluating the impact of interventions in the Multisite Violence Prevention Project: Samples, procedures, and measures. *American Journal of Preventive Health, 26*, 48-61.

Moffitt, T. E. (1993). Adolescent-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674-701.

Mishna, F., Saini, M., & Solomon, S. (2009). Ongoing and online: Children and youth's perceptions of cyber bullying. *Children and Youth Services Review, 32*, 1222-1228. doi: 10.1016/j.childyouth.2009.05.004

Mplus. (2014). *Chi-squared difference testing using the Santorra-Bentler scaled chi-square*. Retrieved from http://www.statmodel.com/chidiff.shtml

Muthén, B. (2003, July 8). *Two questions about LCS.* Retrieved from http://www.statmodel.com/discussion/messages/13/291.html?1363109500

Muthén, L. (2006, December 4). DIFFTEST. Message posted to http://www.statmodel.com/discussion/messages/9/1865.html?1375897250

Muthén, L. (2007, January 22). Chi-squared difference test using WLSMV. Message posted to http://www.statmodel.com/discussion/messages/9/1248.html?1258553149

Muthén, L. (2013, April 10). *CFA, missing by design (cat variables).* Message posted to http://www.statmodel.com/cgi-bin/discus/discus.cgi?pg=prev&topic=9&page=12288

Nansel, T.R., Haynie, D.L., & Simons-Morton, B.G. (2003). The association of bullying and victimization with middle school adjustment. *Journal of Applied School Psychology, 19*, 45-61. doi: 10.1300/J008v19n02_04

Nicol, A., & Fleming, M.J. (2010). "I h8 u": The influence of normative beliefs and hostile response selection in predicting adolescents' mobile phone aggression – A pilot study. *Journal of School Violence, 9*, 212-231. doi: 10.1080/15388220903585861

Nylund, K., Asparouhouv, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling, 535-569.* doi: 10.1080/10705510701575396

Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. London: Wiley.

Orpinas, P., & Frankowski, R. (2001). The aggression scale: A self-report measure of aggressive behavior for young adolescents. *Journal of Early Adolescence, 21*, 51-68.

Patchin, J. W., & Hinduja, S. (2006). Bullies move beyond the schoolyard: A preliminary look at cyberbullying. *Youth Violence and Juvenile Justice, 4*, 148-169. doi: 10.1177/1541204006286288

Pellegrini, A. D., & Long, J. D. (2002). A longitudinal study of bullying, dominance, and victimization during the transition from primary through secondary school. *British Journal of Developmental Psychology, 20*, 259-280.

Perren, S., Dooley, J., Shaw, T., & Cross, D. (2010). Bullying in school and cyberspace: Associations with depressive symptoms in Swiss and Australian adolescents. *Child and Adolescent Psychiatry and Mental Health, 4*, 1-10.

Perry, D.G., Perry, L.C., & Rasmussen, P. (1986). Cognitive social learning mediators of aggression. *Child Development, 57*, 700-711.

Pew Research Internet Project. (2013). Teen internet access demographics. Retrieved from http://www.pewinternet.org/data-trend/teens/internet-user-demographics/

Pornari, C. D., & Wood, J. (2010). Peer and cyber aggression in secondary school students: The role of moral disengagement, hostile attribution bias, and outcome expectancies. *Aggressive Behavior, 36*, 81-94. doi: 10.1002/ab.20336

Quiggle, N.A., Garber, J. Panak, W.F., & Dodge, K.A. (1992). Social information processing in aggressive and depressed children. *Child Development, 63*, 1305-1320.

Ramaswamy, V., DeSarbo, W., Reibstein, D. J., & Robinson, W. T. (1993). An empirical pooling approach for estimating marketing mix elasticities with PIMS data. *Marketing Science, 12*, 103-124. doi: 10.1287/mksc.12.1.103

Ramirez, A., Eastin, M. S., Chakroff, J., & Cicchirillo, V. (2008). Towards a communications-based approach to cyber-bullying. *Handbook of Research on Computer-Mediated Communication,* 339-352.

Raskauskas, J., & Stoltz, A. D. (2007). Involvement in traditional and electronic bullying among adolescents. *Developmental Psychology, 43*, 564-575. doi: 10.1037/0012-1649.43.3.564

Ritzhaupt, A. D., Liu, F., Dawson, K., & Barron, A. E. (2013). Differences in digital information and communication technology literacy based on socio-economic status, ethnicity, and gender: Evidence of a digital divide in Florida schools. *Journal of Research on Technology in Education, 45*, 291-307. doi: 10.1080/15391523.2013.10782607

Schafer, J. L., & Graham, J. W. Missing data: Our view of the state of the art. *Psychological Methods, 7,* 147-177. doi: 10.1037//1082-989X.7.2.147

Simmons, R.G., Black, A., & Zhou, Y. (1991). African-American versus White children and the transition into junior high school. *American Journal of Education,* 481-520. doi: 0195-6744/91/9904-0006

Slonje, R., & Smith, P.K. (2008). Cyberbullying: A new type of bullying? *Scandinavian Journal of Psychology, 49*, 147-154. doi: 10.1111/j.1467-9450.2007.00611.x

Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry, 49*, 376–385. doi:10.1111/j.1469-7610.2007.01846.x

Sontag, L. M., Clemans, K. ., Graber, J. A., & Lyndon, S. T. (2011). Traditional and cyber aggressors and victims: A comparison of psychosocial characteristics. *Journal of Youth Adolescence, 40,* 392-404. doi: 10.1007/s10964-010-9575-9

Sourander, A., Klomek, A. B., Ikonen, M., Lindroos, J., Luntamo, T., Koskelainen, M., Ristkari, T., & Helenius, H. (2010). Psychosocial risk factors associated with cyberbullying among adolescents. *Archives of General Psychology, 67*, 720-728.

Subrahmanyam, K., & Greenfield, P. (2008). Online communication and adolescent relationships. *The Future of Children, 18*(1), 119-146.

Suler, J. (2004). The online disinhibition effect. *CyberPsychology & Behavior, 7*(3), 321-326.

Sullivan, T. N., Esposito, L., & Farrell, A. D. (November, 2003). *Relation between Overt and Relational Victimization and Problem Behaviors in Adolescence*. Paper accepted for presentation at the annual conference for the Association for Advancement of Behavior Therapy, Boston, MA.

Sullivan, T.N., Farrell, A.D., & Kliewer, W. (2006). Peer victimization in early adolescence: Association between physical and relational victimization and drug use, aggression, and delinquent behaviors among urban middle school students. *Development and Psychopathology, 18*, 119-137.

Sticca, F., Ruggieri, S., Alsaker, F., & Perren, S. (2013). Longitudinal risk factors for cyberbullying in adolescence. *Journal of Community and Applied Social Psychology, 23*, 52-67. doi: 10.1002/casp.2136

Takahashi, F., Koseki, S., & Shimada, H. (2009). Developmental trends in children's aggression and social problem-solving. *Journal of Applied Developmental Psychology, 30*, 265-272. doi:10.1016/j.appdev.2008.12.007

Tapper, K., & Boulton, M.J. (2007). Sex differences in levels of physical, verbal, and indirect aggression amongst primary schoolchildren and their association with beliefs about aggression. *Aggressive Behavior, 30*, 123-145. doi: 10.1002/ab.20010

Tisak, M. S. (1995). Domains of moral reasoning and beyond. *Annals of Child Development, 11,* 95-130.

Tokunaga, R. S. (2010). Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Computers in Human Behavior, 26,* 267-277. doi: 10.1016/j.chb.2009.11.014

Underwood, M. K., Beron, K. J., & Rosen, L. H. (2008). Continuity and change in social and physical aggression from middle childhood through early adolescence. *Aggressive Behavior*, *35*, 357-375. doi: 10.1002/ab.20313

Van Dijk, J. (2006). Digital divide research: Achievement and shortcomings. *Poetic, 34*, 221‑235.

Wade, A., & Beran, T. (2011). Cyberbullying: The new era of bullying. *Canadian Journal of School Psychology, 26*, 44-61. doi: 10.1177/0829573510396318

Wang, J., Iannotti, R. J., & Luk, J. W. (2012). Patterns of adolescent bullying behaviors: Physical, verbal, exclusion, rumor, and cyber. *Journal of School Psychology, 50,* 521-534. doi: 10.1016/j.jsp.2012.03.004

Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*, 368-375. doi:10.1016/j.jadohealth.2009.03.021

Wang, J., & Wang, X. (2012). *Structural equation modeling applications using Mplus: Methods and applications (3rd ed.)*. Hoboken, NJ: Wiley.

Werner, N. E., Bumpus, M. F., & Rock, D. (2010). Involvement in internet aggression during early adolescence. *Journal of Youth and Adolescence, 39*, 607-619. doi: 10.1007/s10964-009-9419-7

Werner, N. E., & Crick, N. R. (1999). Relational aggression and social-psychological adjustment in a college sample. *Journal of Abnormal Psychology, 108*, 615-623.

Werner, N.E., & Grant, S. (2009). Mother's cognitions about relational aggression: Associations with discipline responses, children's normative beliefs, and peer competence. *Social Development, 18*, 77-98. doi: 10.1111/j.1467-9507.2008.00482.x

Werner, N.E., & Nixon, C.L. (2005). Normative beliefs and relation aggression: An investigation of the cognitive bases of adolescent aggressive behavior. *Journal of Youth and Adolescence, 34*, 229-243. doi: 10.1007/s10964-005-4306-3

Williams, K. R., & Guerra, N. C. (2007). Prevalence and predictors of internet bullying. *Journal of Adolescent Health, 41,* S14-S21. doi: 10.1016/j.jadohealth.2007.08.018

Ybarra, M. L., & Mitchell, K. J. (2004). Online aggressor/targets, aggressors, and targets: A comparison of associated youth characteristics. *Journal of Child Psychology and Psychiatry, 45*, 1308-1316. doi: 10.1111/j.1469-7610.2004.00328.x

Ybarra, M. L., & Mitchell, K. J. (2007). Prevalence and frequency of internet harassment instigation: Implications for adolescent health. *Journal of Adolescent Health, 41*, 189-195.

Appendix 1

Glossary of Terms Related to Electronic Aggression

Term	Description	Typical Electronic Media
Blocking	Excluding a peer from online groups or communication, or encouraging others to do so	Social networking sites
Bombing	Setting up a program to send so many simultaneous emails to an account that the account crashes, and the victim can no longer access or receive emails	Email
Broadcasting (Rumor-spreading)	Electronically spreading true or false information about a peer that damages his or her image, reputation, social status, or relationships	Multiple options
Defriending	Changing one's recorded relationship with a peer from "friend" to having no relationship	Social networking sites
Flaming	Posting taunting or insulting messages about the subject of a discussion or web page	Online discussion forums
Hacking	Accessing a peer's email or other online accounts without permission; May involve changing information on a person's social networking account for the purposes of humiliation, or changing passwords to lock out the victim	Email, social networking sites

Happy Slapping	Physically attacking a peer, sabotaging a peer, or forcing a peer to engage in a humiliating or embarrassing behavior, video recording the act, and distributing the video electronically	Cell phones, email, social networking sites, video sharing sites
Impersonation (Deception, Masquerading)	Taking on another person's identity (sometimes by hacking) when interacting with others; May be intended to damage the victim's relationships, feelings of safety, or privacy	Email, social networking sites, cell phones
Online polling sites	Creating or participating in a site that allows adolescents to rate their peers in ways that are designed to criticize or degrade one's peers	Websites created by peers
Photoshopping	Altering a photo or video and distributing it electronically in order to embarrass or humiliate someone	Cell phones, email, social networking sites, video sharing sites
Trolling	Posting hostile messages about a participant in a discussion	Online discussion forums

Vita

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