SOCIAL, EMOTIONAL, COGNITIVE, AND PHYSIOLOGICAL CORRELATES OF ELECTRONIC SOCIAL BEHAVIOR

by

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Abstract

There has been very little research that has studied the capacities that can be fostered to mitigate the risk for involvement in electronic bullying or victimization and almost no research examining positive electronic behavior. The primary goal of this dissertation was to use the General Aggression Model and Anxious Apprehension Model of Trauma to explore the underlying cognitive, emotional, and self-regulation processes that are related to electronic bullying, victimization, and prosocial behavior. In Study 1, we explored several potential interpretations of the General Aggression Model that would accurately describe the relationship that electronic self-conscious appraisal, cognitive reappraisal, and activational control may have with electronic bullying and victimization. In Study 2, we used the Anxious Apprehension Model of Trauma to explore rejection cognitions as the mediator of the relationships among emotionality (emotionality, shame, state emotion responses, and physiological arousal) and electronic bullying and victimization using structural equation modeling. In addition, we explored the role of rejection cognitions in mediating the relationship of moral disengagement with electronic bullying. In Study 3, we examined predictors of electronic prosocial behavior, such as bullying, victimization, time online, electronic proficiency, electronic self-conscious appraisals, emotionality, and self-regulation. All three studies supported the General Aggression Model as a framework to guide the study of electronic behavior, and suggest the importance of cognitive, emotional, and behavioral means of regulation in shaping electronic behavior. In addition, each study has implications for the development of high quality electronic bullying prevention and intervention research.
Co-Authorship

The three manuscripts included in this dissertation are the result of collaboration primarily between the doctoral candidate, Ashley Legate and her supervisor, Dr. Wendy M. Craig. As the principal investigator, Ms. Ashley Legate was responsible for the design and conceptualization of this research, as well as data collection, analysis, and preparation of the manuscripts. Dr. Craig assisted with all aspects of the research and provided editorial feedback during the preparation of these manuscripts, and appears as co-author on the three manuscripts.

The second study of this dissertation was conducted in conjunction with Dr. Tom Hollenstein’s lab. As such, Dr. Tom Hollenstein appears as co-author on Study 2.
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Chapter 1

General Introduction

There has been a dramatic increase in the predominance of electronic media in the past decade and an associated increase in concern from mental health professionals regarding electronic bullying (Kowalski, Giumetti, Schroeder, Lattanner, 2014). Electronic bullying has a serious impact on youth, as demonstrated by the incidents of teen suicides resulting from online interactions (Agatston, Kowalski, & Limber, 2007; Inbar, 2009; Krasny, 2010; Ortega, Elpe, Mora-Merchan, Calmaestra, & Vega, 2009). Despite research describing the problem of electronic bullying, there have been very few investigations of the capacities that can be fostered to mitigate the risk for ongoing involvement in electronic bullying or victimization and almost no research examining prosocial electronic behavior. The literature has neglected two important domains: 1) the development of a comprehensive model of electronic social behavior and 2) a consideration of prosocial electronic behavior. To fill these gaps in knowledge, the goal of this dissertation was to build a comprehensive model of electronic behavior that outlines the underlying cognitive, emotional, self-regulation, and physiological processes associated with electronic bullying, victimization, and prosocial behavior.

Gaps in the Literature

A comprehensive psychological model of electronic social relationships is critical for several reasons. First, without an understanding of the basic relationships that cognitive, emotional, self-regulation, and physiological processes have with electronic bullying and victimization, prevention, intervention, and legislation are built upon assumptions, rather than factual knowledge of how to influence these behaviors. Second, a comprehensive model that examines cognitions, emotion, self-regulation, and physiology simultaneously ensures the most important processes are targeted in electronic bullying interventions. Two studies in this dissertation examined the above-mentioned psychological processes as they relate to electronic bullying and victimization. The third study of this dissertation identified the positive behaviors youth engage in online and their associated processes. Together, the three studies provide a comprehensive understanding of electronic behavior by employing the General Aggression Model as a framework for exploring the salient associated processes. As such, these three studies provide the preliminary data to inform the prevention efforts that simultaneously protects youth from unhealthy electronic social interactions and their consequences, while
also building citizenship and positive community online (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Lerner, Phelps, Forman, & Bowers, 2009).

**General Aggression Model**

Kowalski et al. (2014) have proposed the General Aggression Model as a theoretical framework for studying electronic behavior that fills critical gaps in the electronic bullying literature. The General Aggression Model describes personal inputs, internal states, proximal processes, and distal outcomes associated with aggression (Anderson & Bushman, 2002; see Figure 1). This model also can be applied to other social behaviors, such as victimization and prosocial behavior, because it is both general and comprehensive. In addition, the model is specifically designed to address the impact of technology on social behavior because it was designed to describe inputs, internal states, and processes influenced by technology and media exposure (Anderson & Bushman, 2002). Personal inputs of the General Aggression Model include general demographics, attitudes, and traits an individual brings to social interactions. Internal states are described as the underlying immediate situational responses that predict or maintain healthy and unhealthy social interactions. These internal states, including cognitions, emotions, and physiology have a complex relationship with one another in how they are associated with bullying and victimization. Proximal processes include appraisals and decision-making that are hypothesized to predict and maintain social interactions such as bullying, victimization, and prosocial behavior. Appraisals are further broken down into primary appraisals, which are appraisals of external threat and secondary appraisals, which are appraisals about one’s own internal resources to respond to primary appraisals. Consequences are the long-term, distal impacts of repeated bullying and victimization exposure such as mental health concerns and other behavior problems. Although past literature has explored inputs and consequences related to electronic behavior, internal states and proximal processes have not been examined (Kowalski et al., 2014). This dissertation focused specifically on cognitive (e.g., moral disengagement;), emotional (e.g., self-conscious appraisal, emotionality, state emotion responses, and cognitive reappraisal), and self-regulation processes (e.g., attentional control and motivational control). We also examined personal inputs, such as electronic proficiency, time spent online, and moral disengagement attitudes. These processes and inputs are hypothesized to be influenced by characteristics of the electronic context and, thus, have specific relevance to electronic behavior. After applying the General Aggression Model (see Figure 1) to the study of electronic bullying and victimization in Study 1, we then examined a clinically
applicable model of electronic bullying and victimization that described internal states of the individual during social exclusion in Study 2 (Figure 1; Study 2). Internal states were examined through an application of the Anxious Apprehension Model of Trauma to electronic bullying and victimization (Jones & Barlow, 1990). This model was applied for two primary reasons. First, to enhance clinical understanding of the trauma processes associated with involvement in electronic bullying and second, to provide a more detailed picture of the underlying mechanisms subsumed under the internal states component of the General Aggression Model. The Anxious Apprehension Model posits that trauma, such as electronic bullying and victimization, results in unhealthy changes in underlying state and trait beliefs that cause changes in emotional and physiological responses (Jones & Barlow, 1990). The Anxious Apprehension Model of Trauma is complementary to the General Aggression Model, but it is divergent in that it describes these internal states only as a consequence of the trauma of bullying. In contrast, the General Aggression Model conceptualizes internal states as both skills deficits that place youth at risk for bullying and victimization and consequences of victimization and bullying experiences. Finally, the Anxious Apprehension Model of Trauma provides a more in-depth understanding of the underlying cognitive mechanisms that maintain involvement in electronic bullying and victimization (Jones & Barlow, 1990).

Figure 1. General Aggression Model
Electronic Characteristics that Impact Cognition, Emotion, Physiology, and Self-regulation

It is important to explore a comprehensive model of social behavior in the electronic context specifically, because use of technology has a substantial impact on cognitive, emotional, physiological, and self-regulation processes, states, and inputs implicated in the General Aggression Model (Fox, Rosen, & Crawford, 2009; Martin, Coyier, VanSistine, & Scroeder, 2013; Sherman, 2001; Subrahmanyam, Reid, Waechter, & Espinoza, 2008). Consequently, the electronic context can change the way we socially interact with our others (Abouzahra, Yuan, & Tan, 2014; Crawford, 2009; Misra, Cheng, Genevie, & Yuan, 2016; Shapiro & Margolin, 2014; Walther, 1996). The General Aggression Model proposes that electronic media has the most notable impact on human cognition. The electronic environment is unique in that its use is widespread, despite how limitedly its users understand the platform itself and its impact on their cognitive processing (Sherman, 2001). For example, the electronic environment, with its scarcity of nonverbal cues from social partners, forces a preference for its users to remain self-focused rather than other-focused in their cognitions (Buffardi & Campbell, 2008; Sherman, 2001). In addition, electronic groups are formed and function differently because of the potential for anonymity and the possibility that there are observers and participants in social interactions that do not make themselves visible (Subrahmanyam et al., 2008; Sia, Tan, & Wei, 2002). Thus, group norms about acceptable behavior and cognitions are divergent online when compared to offline contexts (Hooper & Kalidas, 2012; Sia, et al., 2002).

With respect to emotion processing online, there have been hypotheses that emotion expression would be muted due to lack of physical contact between social partners; however the opposite has been shown to be true (Martin, et al., 2013). Emotion responding may be increased in the electronic context for several potential reasons. First, because people can read and re-read their messages, they can become more entrenched in the emotion they experienced while writing the message (Martin, et al., 2013). Second, it may be more difficult to ascertain the emotion of our social partners online when there are sparse nonverbal cues. This scarcity of cues may further foster a bias towards one’s own emotion rather than the emotion of a social partner (Matheson & Zanna, 1988; Sproull & Kiesler, 1986). In addition, large audiences, rapid spreading of information, and the permanency of information online may intensify social emotions such as embarrassment and shame (Smith, Webster, Parrott, & Eyre, 2002). The physiological arousal components of the General Aggression Model also
can be influenced by characteristics of the electronic environment. For example, Facebook use increases physiological arousal (Mauri, Cipresso, Balgera, Villamira, & Riva, 2011).

Self-regulation is also impacted by characteristics of the online environment, such as the rapid pace of technological communication and the potential for multi-tasking online (Fox, et al., 2009). Quick responses to messages and posts are fostered by the medium, which results in norms that social responses should be rapid during electronic communication (Kalman & Rafaeli, 2011). With the quick pace of technology and the disinhibition effect of communicating online (uninhibited behavior as a result of physical distancing of social partners) people may struggle to regulate their own behavior, which may result in impulsively saying or doing things that then have a large impact or reach a large audience (Kim & LaRose, 2004). The increased potential for multi-tasking online makes it difficult to maintain a focus on long-term goals and can split cognitive energy between multiple social interactions or electronic tasks (Fox et al., 2009). Given the unique qualities of the electronic context, it is important to use the General Aggression Model to inform our understanding of the cognitive, emotional, and self-regulatory underpinnings of electronic behaviors specifically. Below we will identify the specific social behaviors examined in the current dissertation followed by a detailed exploration of the personal input, internal state, and proximal processing components of the General Aggression Model examined in relation to these social behaviors.

**Electronic Bullying, Victimization, Prosocial Behavior and Defending**

The four electronic social behaviors examined in the current dissertation were bullying, victimization, kindness/sharing, and defending. These four behaviors were chosen for several reasons. First, these behaviors are all key social experiences that shape youths’ understanding of relationships and socially acceptable behavior with minimal influence from adults. Second, electronic bullying and victimization has enormous social, mental health and educational costs (Craig & Pepler, 2007; Giga, Hoel, & Lewis, 2008). Third, studying electronic bullying and victimization in conjunction with electronic prosocial behavior provides a dual understanding regarding how to mitigate risk for costly peer interactions while simultaneously building capacity for prosocial peer interactions and social responsibility. Below we will describe each of the four electronic behaviors in more detail.

Electronic bullying was originally defined by applying the offline bullying definition to the electronic context. This definition described electronic bullying as the use of power through electronic media repeatedly
with the intention to harm or cause distress in another (Vandebosch & Cleemput, 2008). However, it is unclear whether these criteria of power, repetition, and intention are consistently present in instances of electronic bullying (Dooley, Pyzalski, & Cross, 2009; Viegas, 2005). As such, current literature supports using a behavioral definition of bullying that outlines modes and methods of bullying others that represent common behaviors that youth themselves define as electronic bullying behavior (Law, Shapka, Hymel, Olson, & Waterhouse, 2012). We use a behavioral measure of electronic bullying in Study 1 and 3, but were unable to do so in Study 2. Electronic bullying behavior has been associated with a myriad of personal inputs and consequences. For example, electronic bullying has been associated with moral disengagement, a cognitive attitude that encourages behavior that is not in keeping with one’s own morals (Almeida, Correia, & Marinho, 2009; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, Berrone, & Zanetti, 2012). Electronic bullying also has been linked to consequences such as depression, suicidal ideation, and weapon carrying (Hinduji & Patchin, 2010; Ybarra, Diener-West, & Leaf, 2007). Electronic victimization is the experience of being on the receiving end of electronic bullying and is defined as significant distress in response to electronic acts that are intended to harm the individual (Vandebosch & Cleemput, 2008). Similar to electronic bullying we aimed to use a behavioral or experiential measurement of electronic victimization rather than a definitional measure where possible. Electronic victimization has been associated with mental health consequences such as depression, suicide, and social anxiety (Dempsey, Sulkowski, Nichols, & Storch, 2009; Hinduji & Patchin, 2010). It also has been associated with other consequences such as a decline in physical, social, cognitive, academic, and emotional functioning (Beran & Li, 2005; Hinduji & Patchin, 2008; Mitchell, Wolak, & Finkelhor, 2007; Ybarra, Esplage, & Mitchell, 2007).

It is also important to understand positive online experiences such as electronic prosocial behavior, which include helping, defending, sharing, and caring behaviors youth engage in online (Caravita, DiBlasio, & Salmivalli, 2009; Eisenberg, Fabes, & Spinrad, 2007; Gini, Albiero, Benelli, & Altoe, 2008; Lodge & Frydenberg, 2005; Poyhonen, Juvonen, & Salmivalli, 2010). These prosocial behaviors can be broken down into two types. The first type is termed electronic reactive prosocial behavior, which involves behaviors that intend to mitigate a peers’ distress and remedy a moral transgression. The current dissertation examines one form of reactive prosocial behavior called electronic defending, which involves comforting or supporting peers who have been bullied. Electronic proactive prosocial behavior includes sharing and caring behaviors enacted
online without the presence of a moral transgression (Eisenberg, Fabes, & Spinrad, 2007). Although some research has described electronic reactive prosocial behavior, no studies to date have examined electronic proactive prosocial behaviors (Machackova, Dedkova, Sevcikova, & Cerna, 2013). In the offline context these two forms of prosocial behaviors are protective against involvement in unhealthy peer interactions and they also predict other positive outcomes such as high grades, decreased drug and alcohol use, and reduced risk for mental health concerns (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; for a review see Eisenberg, Fabes, & Spinrad, 1998; Ladd & Profilet, 1996; Obermann, 2011). Literature across these four domains of electronic behavior suggests the utility of exploring the personal inputs and consequences of these four behaviors; however there is a paucity of research examining proximal process and internal state components of the General Aggression Model. These components are particularly important to examine because they are more proximally and potentially directly related to electronic social behaviors, whereas the literature to date has focused on primarily distal inputs and outcomes. We will explore in detail below the importance of examining personal inputs, internal states, and proximal processes as they relate to all four electronic social behaviors.

**Personal Inputs**

Personal inputs of the General Aggression Model consist of “person factors”, including demographics and knowledge that have an impact on unhealthy and healthy peer interactions (Anderson & Bushman, 2002). Gender is a demographic personal input that impacts the quality and quantity of electronic socialization (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Odell, Korgen, Schumacher, Delucchi, 2000). Furthermore, the offline bullying literature has demonstrated that gender moderates the relationships among inputs, processes, internal states, and social behaviors (Hamilton, Newman, Delville, & Delville, 2008; Monks, Smith, & Sweetenham, 2003; Novik et al., 2006). The electronic literature has not yet explored gender as a moderator of the relationships of cognitive, emotional, and self-regulation processes with electronic prosocial behavior. To fill this gap in our understanding, Study 3 explored gender differences in the models of prosocial behavior.

A variety of attitudes also have been explored as important personal inputs associated with offline and electronic bullying and victimization (Perren & Gutzwiller-Helfenfinger, 2012; Rigby, 1997). Moral disengagement is an attitude that condones amoral behavior, which has been consistently, positively associated with electronic bullying (Almeida, et al., 2009; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, et al., 2012). Consequently, moral disengagement attitudes’ association with electronic bullying
was examined in Study 1 and Study 2. Such attitudes that support antisocial online behavior may conversely suppress electronic prosocial behavior. Moral disengagement attitudes may also act to suppress electronic prosocial behavior because they tend to foster inaction and dehumanize individuals, both of which decrease human capacity to help (Bandura, et al., 1996; Bandura, Underwood, & Fromson, 1975; Obermann, 2011). Consistent with this tenet, moral disengagement attitudes have been negatively associated with offline prosocial behavior (Bandura et al., 1996; Obermann, 2011). Given this past literature, Study 3 examined whether moral disengagement attitudes may suppress electronic prosocial behavior.

Knowledge, such as technological and social proficiency, has also been studied with respect to offline and electronic bullying and victimization. For example, technology proficiency and time online have been positively associated with electronic bullying and victimization (Hinduja & Patchin, 2008; Sticca, Ruggieri, Alsaker, & Perren, 2013; Ybarra & Mitchell, 2004). In Study 1 electronic proficiency and time online were included as covariates associated with electronic bullying and victimization. Although electronic proficiency and knowledge have been primarily linked to negative electronic outcomes, in Study 3 we explored how this technological knowledge and practice might also be associated with positive outcomes, such as electronic prosocial behavior.

Internal States (the Anxious Apprehension Model)

The General Aggression Model describes three internal states that influence social behavior, which are subcategorized as cognitive, emotional, and psychological arousal states (Anderson & Bushman, 2002). Internal states are situational, direct responses to the social experience being studied (Anderson & Bushman, 2002). In the current dissertation, we studied electronic victimization, which can be most closely approximated by exposing youth to experiences of electronic social rejection. In Study 2 we examined these internal states by inducing social rejection, more specifically ostracism, in a lab simulation and measured state emotion, physiological arousal, and cognition in vivo. Although the General Aggression Model proposes that these cognitive, emotional, and physiological states interact to influence social behavior, it gives very little direction in how they interact. The Anxious Apprehension Model provides very specific, clinically relevant hypothesizes about how these internal states have complex relationships with a history of trauma (i.e., electronic bullying and victimization in the current dissertation; Jones & Barlow, 1990). The Anxious Apprehension Model of Trauma describes the importance of state emotional arousal as consequences of trauma that is driven by
cognitions about self, others, and the world (Jones & Barlow, 1990). Using the Anxious Apprehension Model of Trauma, Study 2 examined electronic bullying and victimization as predictors of physiology, state and trait emotion responding, and trait attitudes. Furthermore, in Study 2, we examined how state cognitions act as a mediator of the relationship electronic bullying and victimization has with state emotion arousal, trait emotionality, and physiological arousal.

**Proximal Processes**

The General Aggression Model posits that the internal states described above subsequently influence youths’ proximal processes, including youths’ appraisals and decision-making (Anderson & Bushman, 2002). There are two main types of appraisals: primary and secondary appraisals (Anderson & Bushman, 2002). Primary appraisals are interpretations of threat, such as threat to one’s sense of self. In the current dissertation, self-conscious appraisals and emotionality have been chosen as self-reflective primary appraisals. Self-conscious appraisals are interpretations of shame, self-blame, and embarrassment in social situations. Self-conscious appraisals have been associated with offline aggression, victimization, and prosocial behavior (Ahmed & Braithwaite, 2004; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lazarus & Folkman, 1991; Menesini & Camodeca, 2008; Olthof, 2012; Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996). The electronic context may impact self-conscious appraisal because large online audiences are known to increase shame and embarrassment (Smith et al., 2002). Across two of the studies, self-conscious appraisals in response to electronic scenario were investigated as primary appraisals related to electronic bullying, victimization, and prosocial behavior. A second type of primary appraisal, emotionality, is defined as youths’ interpretation of their own emotions as intense and over-reactive. Emotionality is a proximal process that has been associated with offline bullying, victimization, and prosocial behavior (Arsenio & Lemerise, 2001; Fabes et al., 1994). In the electronic context, emotionality may be amplified as a result of focusing on one’s own emotions rather than the emotions of others (Matheson & Zanna, 1988; Sproull & Kiesler, 1986). Therefore, in Study 2 and 3 we examined emotionality in relation to electronic bullying, victimization, and prosocial behavior.

Emotion regulation was examined as a secondary appraisal associated with electronic behaviors. One component of emotion regulation is the capacity to cognitively reinterpret the meaning of an emotional response, termed cognitive reappraisal. Cognitive reappraisal has been selected as an important secondary
appraisal in this dissertation because adaptive emotion regulation skills are less prevalent in those who have been victimized offline in comparison to uninvolved youth (Wilton, Craig, & Pepler, 2000). In addition, cognitive reappraisal may be more relevant than other types of emotion regulation online because of the tendency to become fixated on one’s own emotional appraisal of online situations (Martin, et al., 2013). Thus, cognitive reappraisal skills may be very difficult to access online when an individual is entrenched in his or her own emotional experiences and this entrenchment also may be associated with the maintenance of peer conflict such as bullying and victimization (Martin, et al., 2013). In Study 1, we examined the relationship between cognitive reappraisal and electronic bullying and victimization.

Anderson and Bushman (2002) suggest that the decision-making component of proximal processing is driven by impulsive versus thoughtful action. In the current dissertation, we represented the capacity for decision-making by examining self-regulation skills in relation to electronic behaviors, consistent with other applications of the General Aggression Model (DeWall, Anderson, & Bushman, 2011). Self-regulation has been positively associated with proactive aggression; however, reactive aggression has been associated with poorer self-regulation (Dodge, 1991; Unnever & Cornell, 2003). Furthermore, poor self-regulation skills have been linked to offline victimization (Dodge, 1991; Unnever & Cornell, 2003). Self-regulation may be a particularly important skill that protects youth from involvement in unhealthy online peer interactions because of the increased risk for divided attention (multi-tasking) and impulsivity in this context. We specifically examined two of the four primary components of self-regulation in the current study: attentional control and motivational control (activational control in Study 1 and motivational control in Study 2; Stahl, et al., 2014). These two self-regulation components were examined because of their relevance to the electronic environment. Attentional control can be difficult to maintain in environments that divide attention and provide distractions, such as the electronic environment. The electronic environment may also particularly impact motivational control because the possibility of being an invisible observer can relieve social pressure to act in appropriate ways. In Study 1 we examined the relationship of activational control (motivational control) with electronic bullying and victimization. Given the association of self-regulation skills with offline prosocial behavior, we also examined the role of attentional and motivational control in electronic prosocial behaviors in Study 3 (Bellanti & Bierman, 2000; Eccles & Wigfield, 2002; Kochanska, Murray, & Coy, 2006; Sage Kavussanu, & Duda, 2006).
Contribution to Literature

Together the three studies of this dissertation provide a comprehensive examination of electronic social behavior using the General Aggression Model framework, which has not yet been examined. Each study makes a unique contribution to the development of a comprehensive model of electronic behavior. Study 1 provides the first examination of proximal process components of the General Aggression Model in the electronic bullying and victimization context. Study 2 provides the first examination of internal cognitive, emotional, and physiological responses to social exclusion and their association with electronic bullying and victimization trauma histories. Furthermore, in this study we explored state cognitions as mechanisms that underlie the relationship of electronic bullying and victimization with emotional responses. Study 3 provides the first examination of electronic proactive prosocial behavior as a construct, as well as the first application of the General Aggression Model to the study of electronic proactive and reactive prosocial behavior. This dissertation will be the first set of studies that answers key questions about the cognitive, emotional, physiological, and self-regulation processes and internal states related to both healthy and unhealthy online social relationships.
References


Law, D. M., Shapka, J. D., Hymel, S., Olson, B. F., & Waterhouse, T. (2012). The changing face of
bullying: An empirical comparison between traditional and internet bullying and victimization.


Chapter 2

Primary Appraisals, Secondary Appraisals, and Self-Regulation as Predictors of Electronic Bullying and Victimization

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Abstract

Electronic bullying has been largely examined from an atheoretical framework. The current study applied the General Aggression Model to explore a theory driven model of electronic bullying and victimization. The study specifically examined proximal processes associated with electronic bullying and victimization including electronic self-conscious appraisal, cognitive reappraisal, and activational control. Self-report data were collected from a sample of 173 Canadian high school students. Structural equation modeling results indicated that electronic bullying was positively associated with moral disengagement and negatively associated with self-conscious appraisals. In addition, electronic victimization was negatively associated with both cognitive reappraisals and activational control. Results suggested the impact of cognitive, emotional, and behavioral forms of regulation on electronic peer interactions. In addition, the contrasting electronic bullying and victimization findings were conceptualized as artifacts of the power differential between individuals perpetuating electronic bullying and individuals being electronically victimized. Recommendations were made for future studies that explore the relationship among electronic bullying and victimization and additional General Aggression Model components, such as situational inputs and internal states.
**Introduction**

To date, much of the literature on electronic bullying has been atheoretical. Recent literature has put forward a potential theoretical model to guide future electronic bullying and victimization research (Brown, Kilpatrick Demaray, & Secord, 2014; Feinstein, Bhatia, & Davila, 2014; Gradinger, Stohmeier, & Spiel, 2009). Kowalski, Giumetti, Schroeder, and Lattanner (2014) have suggested that the General Aggression Model is an appropriate model to explain electronic bullying and victimization. The General Aggression Model was designed to consider the impact of media, particularly television, on aggressive behavior and other unhealthy peer interactions, such as bullying. As one of few theories that accounts for the impact of media and technology, it is the most applicable model for understanding electronic bullying and victimization. The four primary components of the General Aggression model are: personal inputs, proximal processes, internal states, and distal outcomes (see Figure 1 for the components of this model examined in the current study). The first component of the model, personal inputs, includes factors such demographics, past experiences, knowledge, and personality characteristics (Kowalski et al., 2014). The second component of the General Aggression Model, proximal processes, describes processes that influence peer interactions, such as appraisals and decision-making. The third component of the model, internal states, describes state cognitive, emotional, and physiological responses to aggression or bullying. The last component, distal outcomes, includes the consequences of unhealthy peer interactions, such as physical and mental health problems.

*Figure 1. Preferred Model: General Aggression Model Specific Paths Hypothesized by Kowalski et al. (2014)*

Past literature has given primary attention to personal inputs and distal outcomes associated with electronic bullying and victimization (Kowalski et al., 2014). Although there is research on the association
between proximal processes and offline bullying and victimization, little attention has been given to the underlying proximal processes that may be associated with electronic bullying and victimization (Ahmed & Braithwaite, 2004; Dodge, 1991; Hunter & Boyle, 2004; Menesini & Camodeca, 2008; Unnever & Cornell, 2003). The proximal processes associated with electronic bullying and victimization are important to understand because these relationships may be influenced by the unique characteristics of the electronic environment (Spada, 2014; Gackenback & von Stackelberg, 2007; Suler, 2004). In addition, it is critical to examine specific proximal processes that are known to regulate social behavior, given that disinhibition and dysregulation of behavior is more frequent in online (Lapidot-Lefler & Barak, 2015; Suler, 2004). Past literature has neither directly applied the General Aggression Model to the study of electronic bullying and victimization, nor explored the specificity of the direct and indirect relationships among proximal processes, electronic bullying, and electronic victimization. In addition, no studies to date have examined multiple components of the General Aggression Model simultaneously to evaluate their relative importance in their association with electronic bullying and victimization. By exploring the direct and indirect relationships among personal inputs, proximal processes, and electronic bullying and victimization, this study will provide a theoretically driven examination of electronic bullying and victimization. In addition, the current study will examine the utility of the complex model put forward by Kowalski et al. in comparison to simplistic direct prediction models as well as a model that is consistent with offline bullying and victimization research. In doing so, we will contribute to the development of a theoretical model of electronic bullying and victimization.

Application of the General Aggression Model to Electronic Bullying and Victimization

The General Aggression Model allows for multiple possible direct and indirect paths among social behaviors, inputs, and proximal processes. The possibilities range from very complex to more simplistic direct predictions. Kowalski et al. (2014) presented a complex model of electronic bullying and victimization that was developed through meta-analysis and by surveying researchers about their opinions regarding factors associated with involvement. The results of the meta-analysis provided a proposed interpretation of the General Aggression Model whereby personal inputs predict victimization experiences only, which then shape primary and secondary appraisals (Kowalski et al., 2014). These appraisals are then fed into the decision-making process, which requires self-regulation that then lends itself to making a choice to bully in an electronic social encounter (see Figure 1). Below we outline the offline bullying literature, and information
about electronic social interaction specifically that supports Kowalski et al.’s (2014) pathways among proximal processes, personal inputs, electronic bullying, and electronic victimization. We will compare this model with a model that uses past offline bullying literature as a basis for indirect relationships among electronic bullying, victimization, proximal processes, and personal inputs. In addition, we will compare the Kowalski et al. (2014) model to simplistic models that only allow for direct relationships among these constructs.

**Proximal Processes.** Proximal processes of the General Aggression Model are composed of two components: appraisals and decision-making (Anderson & Bushman, 2002; Carnagey & Anderson, 2003; Runions, 2013). The appraisal process is divided into primary and secondary subtypes (Anderson & Bushman, 2002). Primary appraisal is defined as an evaluation of threat to the self (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Self-conscious appraisals are primary appraisals that involve interpretations of shame, need to hide, embarrassment, and self-blame (Lazarus & Folkman, 1991). Secondary appraisal involves an appraisal of one’s own capacity to respond to threats, for example an individual’s capacity to regulate emotions (Lazarus & Folkman, 1991). An example of a secondary appraisal involving emotion regulation is cognitive reappraisal coping, which involves the ability to use healthy cognitive skills to reinterpret the experience of emotion. The second component of proximal processing is decision-making. The General Aggression Model describes self-regulation as core skills influencing decision-making because self-regulation skills allow youth to remain goal motivated and resist distractions or impulses (Anderson & Bushman, 2002). Self-conscious appraisal, cognitive reappraisal, and activational control are cognitive, emotional, and behavioral processes that are key elements in regulating social behavior. Regulation is particularly important in the electronic environment because disinhibition and dysregulation of behavior is more frequent in online than in offline environments (e.g., disinhibition theory of online behavior; Suler, 2004). Cognitive, emotional, and behavioral regulation processes influence online behavior and the online disinhibition effect specifically (Gackenbach & von Stackelberg, 2007; Spada, 2014; Suler, 2004). Given the importance of these regulatory processes in online behavior, as well as, recent literature linking difficulties with behavioral regulation to electronic bullying and victimization, models of electronic bullying and victimization need to account for them (Vazsonyi, Machackova, Sevcikova, Smahel, & Cerna, 2012). Each of these regulatory proximal processes is explored in more detail below.
Primary Appraisals: Electronic Self-Conscious Appraisal. Electronic self-conscious appraisal is a cognitive-emotional primary appraisal that involves shame, embarrassment, and self-blame interpretations in the face of ambiguous situations (Menesini & Camodeca, 2008; Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996). Youth who have been victimized offline express more self-conscious emotion during simulated scenarios than youth uninvolved in offline bullying (Menesini & Camodeca, 2008). In addition, offline victimization also has been associated with self-blame appraisals (Graham & Juvonen, 1998). There are contextual characteristics of the online environment, which suggest that similar relationships may exist for electronic victimization. For example, electronic social interactions often occur with sparse nonverbal cues (Kiesler, Siegel, & McGuire, 1984). As a result, there is a diminished capacity to appraise peers’ intent. In the absence of these peer appraisals, youth may rely on appraisals based on their own emotions, such as shame. Consistent with this hypothesis, research shows that computer-mediated communication is more strongly associated with appraisals of internal cues (e.g., personal experience of emotion) rather than external appraisals (e.g., emotion of others; Matheson & Zanna, 1988; Sproull & Kiesler, 1986). In addition, electronic audiences are often large and offline social research suggests that large audiences increase the intensity of self-conscious appraisals (Smith, Webster, Parrott, & Eyre, 2002). Taken together, the characteristics of the electronic environment may increase the saliency and reliance on self-conscious appraisals in electronic victimization. Consequently, we hypothesized that electronic victimization would be positively associated with electronic self-conscious appraisals.

With respect to bullying, difficulty acknowledging shame and a tendency to blame others (versus self-blame) are positively associated with offline bullying (Ahmed & Braithwaite, 2004; Georgiou, & Stravrinides, 2008). For youth who bully, the electronic environment may exacerbate the lack of self-conscious appraisals and tendency toward blaming others. For example, self-conscious appraisals are influenced by interpersonal context, such as one’s relationship history with an individual or group (Jones, Manstead, & Livingstone, 2009). In the electronic context, anonymity and unknown size of the audiences make it difficult to determine the characteristics of the audience. This perceived anonymity further reduces youths’ capacity to make realistic or healthy self-conscious appraisals. The physical distance from social partners may also facilitate more victim blaming and reduce youths’ capacity to experience self-conscious appraisals because they do not directly see the facial expressions and emotional responses of their social partners. Offline bullying findings and
characteristics of the electronic environment suggest that there can be a bias against self-conscious appraisals in those who bully online (Menesini & Camodeca, 2008). Furthermore, this lack of self-conscious appraisal may influence an individual’s decision-making processing. For example, self-conscious appraisals regulate behavioral impulsivity (Chun, Patrick, & MacInnis, 2007). In contrast, lack of identification with self-conscious appraisals may foster behavioral impulsivity and engagement in problematic social behavior such as electronic bullying. Consistent with Kowalski et al.’s (2014) model, we hypothesized that there would be a specific pathway from self-conscious appraisal to self-regulation that in turn would be associated with electronic bullying.

Secondary Appraisal: Cognitive Reappraisal. Secondary appraisals of youths’ capacity to respond to primary appraisals of threat also have been associated with offline bullying and victimization (for a review see Hunter & Boyle, 2002). Secondary appraisals includes the capacity to respond to strong emotions, termed emotion regulation may be particularly relevant in the electronic environment because of the increased risk for emotionality online (Derks, Fischer, & Bos, 2008; Martin, Coyier, VanSistine, & Scroeder, 2013). Studies examining emotion regulation in offline bullying suggest that individuals who are victimized by peers struggle with emotion regulation more than uninvolved youth (Garner & Hinton, 2010; Hanish, et al., 2004; McLaughlin, Hatzenbuehler, & Hilt, 2009). There have been no studies examining emotion regulation associated with electronic bullying and victimization (Kochenderfer-Ladd, 2004). One emotion-regulation coping skill that has been positively associated with adaptive social functioning is termed cognitive reappraisal (Gross & John, 2003). Cognitive reappraisal involves youths’ appraisal of their ability to use cognitive reinterpretations to change the emotional significance of an emotional experiences. Cognitive reappraisals may be particularly relevant in the electronic environment for several reasons. First, the physical isolation from social partners that accompanies electronic communication in the electronic medium may put youth at risk for poor emotion regulation. For example, when an individual hears that peers have had similar victimization experiences, his or her own experiences are normalized. These types of normalizing experiences have been associated with more successful emotion regulation after victimization (Bellmore, Witkow, Graham, & Juvonen, 2004; Huitsing, Veenstra, Sainio, & Salmivalli, 2012). In the electronic context, the physical isolation from others during the bullying interaction may increase the perceptions of being alone and unsupported, resulting in the reduction of cognitive reappraisals alternatives following electronic peer victimization. In
addition, cognitive reappraisal involves a capacity for cognitive-emotional flexibility and online communication has been characterized as an environment where entrenchment in one’s own cognitions and emotions is more common than in offline environments (Martin, et al., 2013). This entrenchment fosters inflexibility, which may make the flexibility of cognitive reappraisals difficult to access. We hypothesized that electronic victimization would be negatively associated with cognitive reappraisal of emotions in the current study.

In contrast to peer victimization literature, there is limited literature exploring emotion regulation associated with offline bullying (Schwartz & Proctor, 2000). There is research to support that those who bully have more intense anger reactions and one study indicating that individuals who bully struggle with emotion regulation more than uninvolved youth (Garner & Hinton, 2010; Wilton, Craig, & Pepler, 2000). The electronic environment may further exacerbate these emotion regulation deficits because experiences of emotion are amplified online (Martin, et al, 2013). To add complexity to the role of cognitive reappraisal in electronic bullying, offline aggression literature suggests that emotion regulation interacts with self-regulation to predict aggression in preschoolers such that difficulty regulating anger and frustration along with poor self-regulation predicts the highest risk for aggression (Olson, Lopez-Duran, Lunkenheimer, Chang, & Sameroff, 2011). This finding is consistent with Kowalski et al.’s (2014) conceptualization that emotion regulation predicts electronic bullying through its influence on decision-making (represented by self-regulation in the current study). Thus, we hypothesized that cognitive reappraisal would be negatively associated with electronic bullying through a negative relationship with self-regulation skills.

**Decision Making Process: Self-regulation.** The General Aggression Model postulates that the decision-making component of social processing is associated with aggression and victimization (Anderson & Bushman, 2002). Decision-making is characterized by impulse versus thoughtful action in making social decisions. To represent the thoughtful decision making over impulsive decision-making we have examined a component of self-regulation termed activational control. Activational control is the capacity to persist with a goal despite a strong tendency to avoid it (Eisenberg, Smith, & Spinrad, 2011). Several studies of offline aggression that use the General Aggression Model have used activational control and other measures of self-regulation to represent the decision-making component of the General Aggression Model (Denson, DeWall, & Finkel, 2012; Eisenberg, Eggum, Sallquist, & Edwards, 2010). In fact activational control with respect to
schoolwork has been associated with offline victimization (Skues, Cunningham, & Pokharel, 2005). In addition, there is preliminary evidence that youth who have been electronically victimized have poorer self-regulation skills than their peers without electronic victimization experiences (Sontag, Clemans, Graber, & Lyndon, 2011). The electronic context may amplify the risk for poor self-regulation skills in relation to electronic victimization involvement. For example, youth with poor self-regulation skills are attracted to electronic social interactions rather than offline interactions (Pfiffner, Barkley, & DuPaul, 2006; Zhong, Hardin, & Sun, 2011). As such, these youth engage in behavior that is more impulsive and less thoughtful, which impairs their social communication with peers and subsequently may be associated with greater risk for electronic victimization (Valkenburg & Pete, 2011; Wehmeier, Schacht, & Barkley, 2010). Kowalski et al. (2014) proposed that the association between electronic victimization and decision-making is mediated by appraisals (self-conscious appraisals and emotion regulation). Consistent with this tenet, there is literature supporting the inter-relationship among emotion processing, self-regulation, and offline victimization (Hanish, et al., 2004). Consequently, we hypothesized that electronic victimization would be negatively associated with activational control, a pathway mediated by the primary and secondary appraisals above (self-conscious appraisals and emotion regulation).

With respect to electronic bullying, difficulties with self-regulation have been associated with offline bullying (Unnever & Cornell, 2003). The electronic environment may exacerbate the risk for poor self-regulation skills for youth who electronic bullying for two reasons. First, poor self-regulation online impairs social communication, which may increase risk for peer conflict such as electronic bullying (Valkenburg & Pete, 2011; Wehmeier, et al., 2010) Second, the electronic environment attracts social partners who similarly struggle with poor self-regulation, which further increases the risk for poor social communication and bullying because partners on both sides of the interaction may amplify one another self-regulation weaknesses (Zhong, et al., 2011). More specifically, a construct similar to activational control (goal persistence) has been negatively associated with offline bullying (Gasser & Keller, 2009). In addition, there is evidence that emotion regulation difficulties combined with poor self-regulation predict future offline relational bullying (Terranova, Sheffield, Morris, Bover, 2008). Consistent with offline literature and Kowalski et al.’s (2014) hypothesized model, we predicted that cognitive reappraisals would be negatively associated with electronic bullying indirectly through a positive association with activational control.
Personal Inputs

Personal inputs of the General Aggression Model include psychosocial traits and demographic characteristics of individuals that influence social interactions (Anderson & Bushman, 2002). Although a myriad of personal inputs have been examined in relation to electronic bullying and victimization, only three have been consistently associated with electronic bullying and victimization: time online, electronic proficiency, and moral disengagement attitudes (Hinduja & Patchin, 2008; Pornari & Wood, 2010; Ybarra & Mitchell, 2004). Youth who have been electronically victimized or perpetrate electronic bullying spend more time online than uninvolved youth (Hinduja & Patchin, 2008; Ybarra & Mitchell, 2004). Those who electronic bully also report being more technologically proficient than those who do not bully, whereas victimized only youth reported similar technological proficiency as uninvolved youth (Ybarra & Mitchell, 2004). In addition to these demographics, researchers have found consistent links between psychosocial characteristics such as moral disengagement attitudes with electronic bullying (Almeida, Correia, & Marinho, 2009; Pornari & Wood, 2010; Renati, Berrone, & Zanetti, 2012; Wachs, 2012). Moral disengagement attitudes support engagement in behavior that is contradictory to an individual’s morals. In this study, we examined the relationship of person inputs, including time online, electronic proficiency, and moral disengagement, with electronic bullying and victimization.

In summary, the current study was guided by the General Aggression Model and examined the direct and indirect relationships among proximal processes, personal inputs, electronic bullying, and electronic victimization. Proximal processes including, electronic self-conscious appraisals, cognitive reappraisal, and activational control were examined in relation to electronic bullying and victimization. In addition, personal inputs, such as time online, electronic proficiency, and moral disengagement attitudes, were included as variables associated with electronic bullying and victimization. In examining proximal processes concurrently with personal inputs we aimed to develop a model that determines the relative importance of these three proximal processes as risk factors for involvement. This will be the first study to apply the General Aggression Model to electronic bullying and to examine the gaps in the current models of electronic bullying research identified by Kowalski et al. (2014). It will also be the first study to compare this model, based on electronic bullying theory, to a model based on previous offline bullying literature. As a result, this study will support further development of a theoretical model of electronic bullying and victimization.
Methods

Participants

Students were recruited from three schools in Ontario. One hundred and ninety-four students from grade 9-12 participated in the survey during class time with parental and adolescent consent. The sample was comprised of 50% males and 50% females. There were a larger number of students in younger grades, with 60, 47, 39, and 48 youth reporting being in grades 9, 10, 11, and 12, respectively. The total sample of 194 youth was reduced to 173 due to incomplete data on gender and electronic self-conscious appraisals primarily. Participants who were removed were not significantly different than participants who remained in the analyses on any of the variables included in the analysis below (all \( p > .01 \)).

Measures

The following measures were collected using self-report data. Cronbach alpha values used to measure reliability were reported in Table 1. The structure of each measure was confirmed by examining a measurement model in the context of the Structural Equation Model (see Results section). Items that produced standardized parameter estimates less than .50 were removed from the SEM model and modifications indices were utilized to determine whether error variance associated with items should be correlated (Tabachnick & Fidell 2007).

Demographics (Grade, Gender, Time Online, and Electronic Proficiency). Youth were asked to report their grade and gender. Gender was coded 0 for males and 1 for females. They were also asked how much time they spent online during the regular weekday and during the regular weekend (2 questions). Responses ranged from “less than one hour” to “eight or more hours” (9 response options), with higher scores representing more time spent online. Youth were also asked to report their perception of their proficiency with computers and the internet (2 questions). Responses ranged from “I am much better than most students my age” to “I have much more difficulty than students my age” (5-point scale), with higher scores representing greater proficiency.

Electronic Bullying Roles (Appendix A). Victimization and Bullying were measured using the Cyberbullying Participant Roles questionnaire (CPRQ; McCuaig Edge, Craig, & Legate, 2010; Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996). The CPRQ was designed specifically for assessing participant roles in electronic bullying. The bullying and victimization subscales of the CPRQ asked
participants how often they engage in a variety of online activities, parallel to the offline Participant Roles Questionnaire. The CPRQ asked participants to rate “never” to “often” (5-point scale) in response to statements such as “I have started websites aimed at hurting others.” This version of the CPRQ has also added a question about honesty boxes (a Facebook function that allows peers to anonymously post comments about users), as well as 4 additional questions about being victimized online to provide a more reliable estimate for the previously single item electronic victimization subscale. The two subscales of this measure in the current study included electronic bullying (4 items) and electronic victimization (5 items). Higher scores on the each of the subscales represent more frequent experiences of electronic bullying and victimization, respectively.

**Moral Disengagement.** Moral disengagement was initially meant to be measured using an electronic specific measure of moral justification; however the newly created measure demonstrated poor validity and reliability. Instead, moral disengagement was measured using a four-item Moral Justification subscale of the Moral Disengagement Scale (Bandura, Barbaranelli, Capara, & Pastorelli, 1996). The Moral Justification subscale assesses the degree to which participants were willing to use intellectual arguments and cognitive restructuring to condone immoral actions by asking youth to rate statements such as “It’s ok to fight to protect your friends” from “I disagree” to “I completely agree” (4-point scale; Bandura, et al., 1996). Higher scores on this scale represent stronger moral disengagement attitudes.

**Electronic Self-Conscious Appraisals** (Appendix B). Electronic self-conscious appraisals were measured using a five-item scale that was designed for the current study. The measure was initially designed to measure guilt and shame reactions of adolescents after reading vignettes designed to assess reactions to common ambiguous, potentially electronic bullying, scenarios. This measure was based on Tangney and Dearing’s (2003) response anchors for guilt and shame vignettes, however the vignettes used by Tangney and Dearing (2003) were not ambiguous and chosen based on the universality of participant shame and guilt responses. Although the anchors attempted to capture guilt in shame in the way Tangey and Dearing are able to, the ambiguity of the scenarios created difficulty for confirming a component structure. The vignette structure also made it difficult to design anchors that elicited guilt only and not sense of embarrassment, shame, and self-blame as well. For example, youth read the scenarios where guilt and shame appraisals could be possible and were asked questions to assess the attributions of guilt and shame they would attach to these ambiguous scenarios (e.g., “You go visit your Facebook page to see what pictures people have posted. You
notice a picture of you and comments underneath: a) I need to find out who posted the comments; and b) This is what people really think of me?”). Participants were asked to respond on a 5-point scale from “not at all likely” to “very likely.” Only 5 of the 12 items provided the best fit to the data based on examination of the SEM measurement model (see Results section). When the 5 items retained were examined for face validity, the items that were included reflected a sense of shame, hiding or need to fix the situation to avoid further embarrassment and self-blame. As such, the measure was renamed Electronic Self-Conscious Appraisals, which more accurately reflects the combination of shame, embarrassment, and self-blame, excluding any reference to guilt, which was not measured in the items that were ultimately included. Higher scores on the subscale represented greater self-conscious appraisals.

Cognitive Reappraisal. Cognitive Reappraisal was measured using the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The cognitive reappraisal subscale of the ERQ uses six items to measure adolescents’ ability to use their cognitive skills to change their emotion responses. In the current study we used an abbreviated form of the questionnaire that included three items only (“When I want to feel more positive emotion, I change the way I’m thinking about the situation”, “I control my emotions by changing the way I think about the situation I’m in”, and “When I want to feel less negative emotion, I change the way I’m thinking about the situation”). Youth were asked whether they agree with each statement on a seven-point scale from disagree (1) to agree (7).

Self-regulation: Activational Control. Activational Control was measured using the Effortful Control (EC) scale of the Early Adolescent Temperament Questionnaire – Revised (EATQ-R). The Activational Control subscale of the EC scale is a 5-item questionnaire that measures the ability to perform an action when there is a strong tendency to avoid it (Capaldi & Rothbart, 1992). In the current study, a 4-item solution fit the data better and excluded one item from the hypothesized five-item latent construct structure (standardized parameter estimate = 0.34). The final 4-item Activational Control scale included items such as “If I have a hard assignment to do I get started right away” and reversed coded items such as “I put off working on projects until right before they are due”. Responses on a 5-point scale ranged from “not at all true of me” to “true of me all the time.” High scores on this scale represented greater activational control skills.
**Procedure**

High schools that agreed to have their students participate aided in the dissemination of letters of information and consent forms to parents by providing the mailing addresses of students’ parents or guardians. Both youth and parent/guardian consent were obtained. Youth were asked to complete a questionnaire in their school library that took approximately 30 minutes to complete. Data collection and the treatment of participants complied with APA Ethical Principles (see Appendix C for ethics approval).

**Results**

The mean, standard errors, and correlations among the independent variables used to predict electronic bullying and victimization are listed in Table 1. Gender and grade were considered as personal inputs to include in the models below, given the literature supporting gender and grade differences in electronic bullying and victimization behavior (Kowalski & Limber, 2007; Wang, Iannotti, & Nansel, 2009; Williams & Guerra, 2007). The correlations in Table 1 indicated that grade was not correlated with any outcomes or predictors (ps > .01), and thus grade was removed from the initially hypothesized model. In addition, the correlation between moral justification and electronic self-conscious attribution and the correlation between moral justification and cognitive reappraisal were added to the hypothesized models based on significant correlations observed in the Table 1 as well as theoretical relevance of these relationships (Menesini, et al., 2003). Inconsistent with previous literature, time online and electronic proficiency were not significantly correlated with electronic bullying and victimization, thus these variables were removed from the hypothesized models as control variables. Gender differences in all variables listed in Table 1 were examined. Males reported significantly more moral justification than females, $t(171) = 4.42, p < .001, d = .66$, and females reported more self-conscious appraisals than males, $t(171) = -2.76, p = .01, d = .39$, thus, gender was included as a covariate in all hypothesized models.
Table 1
Correlations Among All Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grade</th>
<th>Electronic Bullying</th>
<th>Electronic Victimization</th>
<th>Time Online</th>
<th>Electronic Proficiency</th>
<th>Moral Justification</th>
<th>Self Conscious Appraisal</th>
<th>Cognitive Reappraisal</th>
<th>Activational Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Bullying</td>
<td>-.10</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Victimization</td>
<td>-.14</td>
<td>.59**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Online</td>
<td>-.03</td>
<td>.12</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Proficiency</td>
<td>.02</td>
<td>.05</td>
<td>.00</td>
<td>-.22**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral Justification</td>
<td>.07</td>
<td>.35**</td>
<td>.10</td>
<td>.05</td>
<td>-.05</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Conscious Appraisal</td>
<td>-.00</td>
<td>.21**</td>
<td>.01</td>
<td>.02</td>
<td>-.04</td>
<td>-.22**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>.15*</td>
<td>-.21**</td>
<td>-.24**</td>
<td>-.05</td>
<td>.04</td>
<td>-.20**</td>
<td>-.06</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Activational Control</td>
<td>-.13</td>
<td>-.07</td>
<td>-.18*</td>
<td>-.12</td>
<td>.13</td>
<td>.02</td>
<td>.06</td>
<td>.08</td>
<td>-</td>
</tr>
<tr>
<td>Mean</td>
<td>10.45</td>
<td>.77</td>
<td>.87</td>
<td>4.30</td>
<td>2.55</td>
<td>0.25</td>
<td>1.32</td>
<td>3.76</td>
<td>3.85</td>
</tr>
<tr>
<td>(SD)</td>
<td>(1.20)</td>
<td>(.79)</td>
<td>(0.81)</td>
<td>(2.28)</td>
<td>(0.74)</td>
<td>(0.49)</td>
<td>(1.08)</td>
<td>(1.54)</td>
<td>(0.82)</td>
</tr>
<tr>
<td>Reliability (α)</td>
<td>.83</td>
<td>.77</td>
<td>.78</td>
<td>.85</td>
<td>.77</td>
<td>.84</td>
<td>.81</td>
<td>.72</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
*** p < .001
Data screening procedures were conducted, including an examination of boxplots, which indicated that there were three univariate outliers. Scores for these outliers were truncated to be within range of group scores using Winsor procedures (Tukey, 1962). Following this transformation, boxplots and Mahalanobis distances indicated that no univariate or multivariate outliers remained ($p = .001$; Wu & Zuo, 2009). Linearity among the variables in each analysis was also confirmed through examination of scatterplots. Finally, examination of the covariance matrix and residual covariances did not provide any evidence of singularity or multicolinearity.

Statistical Package for the Social Sciences (SPSS)-AMOS was used to create Structural Equation models that estimated measurement and path components of the hypothesized models. First, a basic measurement model was implemented with all items loading on each hypothesized latent construct, which also allowed for additional modifications, such as correlated errors that increase the fit of the model (Bollen & Long, 1993). Results from the measurement model suggested that there were low structural weights for items that loaded on the victimization, moral justification, and electronic self-conscious appraisal latent constructs (standardized parameter estimates $< 0.65$; Larwin & Harvey, 2012; Tabachnick & Fidell, 2007). These items were removed from the model (see Measures for details).

Next, a preferred model and three alternative models were compared with respect to model fit using Bayesian Information Criterion ($\text{BIC}_{\text{diff}} > 10$; Kass & Raftery, 1995). BIC was used to compare model fit because it gives preference for simplistic models and we aimed to find the most parsimonious model that could account for the relationships among these variables (Kass & Raftery, 1995). The preferred model was the model presented in Figure 1, which was based on the Kowalski et al.’s application of the General Aggression Model to electronic bullying and victimization specifically, which is referred to below as the “Electronic Specific Model” (Kowalski et al., 2014). The first alternative model was an interpretation of the General Aggression Model using offline bullying and victimization literature, termed the “Offline Model” (Figure 2). This model would place inputs as precursors of electronic bullying and victimization experiences followed by proximal processes as consequences of these social experiences. The final two alternative models are parsimonious models that examine direct relationships of personal inputs and proximal processes have with electronic bullying and victimization (Figure 3; Figure 4; Stevens, 2012). The two simplistic models examine the two possible directionalities of these relationships, given that the study data is cross-sectional. These models were given the label “Parsimonious A” and “Parsimonious B.”
Figure 2. Offline Model

Figure 3. Parsimonious A
The final model retained for interpretation of significant predictors was expected to demonstrate adequate fit on two out of three fit indices before significant predictors would be interpreted (Hoyle & Panter, 1995). Fit statistics used to judge adequate fit were Root Mean Square Error of Approximation (RMSEA < .07; Steiger, 2007), Comparative Fit Index (CFI > .9; Byrne, 1994), and Standardized Root Mean Square residual (SRMR < .08; Browne & Cudeck, 1993).

**Model Comparisons**

Table 2 provides model fit statistics for the four hypothesized models. Based on BIC, there is strong evidence that Parsimonious A is superior to the preferred model, whereas there is very weak evidence that the other two alternative models were superior to the preferred model (Electronic Specific Model). Despite findings that there were similar RMSEA, CFI, and SRMR values for each of the four models, preference was given for a more parsimonious model identified by BIC values. Thus, the Parsimonious A Model was retained as the best model to interpret the data. The Parsimonious A Model modeled gender, bullying, and victimization experiences as having direct relationships with moral justification, electronic self-conscious appraisal, cognitive reappraisal, and activational control. Figure 5 outlines the significant paths provided by Parsimonious A Model. The positive association between electronic bullying and moral justification from previous literature was confirmed. Significant paths unique to the current study included a negative relationship between electronic bullying and electronic self-conscious appraisal, a negative relationship

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**Figure 4. Parsimonious B**

![Diagram showing relationships between gender, moral justification, electronic self-conscious appraisal, cognitive reappraisal, activational control, victimization, and bullying.](image-url)
between electronic victimization and activational control, and a negative relationship between electronic victimization and cognitive reappraisal. All measured variables that composed latent constructs observed standardized parameter estimates at or above 0.65 in this model.

Table 2

*Fit Indices for Structural Equation Models*

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>$\chi^2$</th>
<th>RMSEA</th>
<th>CFI</th>
<th>SRMR</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Specific Model</td>
<td>241</td>
<td>338.17</td>
<td>0.06</td>
<td>0.90</td>
<td>0.09</td>
<td>692.21</td>
</tr>
<tr>
<td>Offline Model</td>
<td>234</td>
<td>350.44</td>
<td>0.05</td>
<td>0.92</td>
<td>0.08</td>
<td>690.55</td>
</tr>
<tr>
<td>Parsimonious A</td>
<td>235</td>
<td>341.66</td>
<td>0.05</td>
<td>0.92</td>
<td>0.07</td>
<td>676.63*</td>
</tr>
<tr>
<td>Parsimonious B</td>
<td>238</td>
<td>382.28</td>
<td>0.06</td>
<td>0.90</td>
<td>0.08</td>
<td>701.79</td>
</tr>
</tbody>
</table>

*Significantly better fit than preferred model based on >10 difference in BIC.
Figure 5. Parsimonious A Model

Discussion

The current study had two primary goals: 1) to apply the General Aggression Model to the study of electronic victimization and bullying and 2) to examine the proximal processes of the General Aggression Model associated with electronic bullying and victimization. With respect to the first goal, we compared four potential interpretations of the General Aggression Model that may be applicable to the study of electronic bullying and victimization. Although there were two complex models proposed, a more parsimonious model that allowed direct relationships between electronic bullying and victimization with inputs and proximal processes more appropriately fit the data. With respect to the second goal, electronic bullying was negatively associated with proximal processes of electronic self-conscious appraisals, whereas electronic victimization was negatively associated with proximal processes of cognitive reappraisal and activational control. The specificity of findings for bullying and victimization suggest that regulatory cognitions (electronic self-conscious appraisals) may be more salient for those who electronically bully, whereas emotional (cognitive reappraisal) and behavioral (activational control) regulation processes may be particularly important when...
studying electronic victimization. Overall, the current study provided preliminary evidence for using the General Aggression Model as a broad framework to study electronic bullying and victimization.

**General Aggression Model Interpretation**

Results of the current study support a parsimonious model of electronic bullying and victimization, whereby bullying and victimization experiences are associated with deficits in moral disengagement inputs, as well as primary appraisals, secondary appraisals, and decision-making processes. Although the two complex models (preferred electronic specific model and offline bullying model) demonstrated adequate fit, and thus, some explanatory power, model comparison statistics suggested that a parsimonious model with direct relationships was preferable. The cross-sectional nature of the current study’s data and findings supporting adequate fit for tests of the models that presented proximal processes as “consequences” versus “precursors” of electronic bullying precludes any conclusions regarding causality. Future research should examine proximal process interventions longitudinally in relation to changes in electronic bullying and victimization to provide stronger support for these causal relationships. The specific associations of electronic bullying and victimization with proximal process are explored in more detail below.

**Proximal Processes**

Our findings support the tenet that different cognitive, emotional, and behavioral regulation processes of the General Aggression Model are associated with electronic bullying versus electronic victimization. The association of cognitive regulation processes with electronic bullying is consistent with offline bullying literature (Keltner, Gruenfeld, & Anderson, 2003; Menesini & Camodeca, 2008). For example, lower self-conscious appraisals have been associated with offline bullying; similar to current findings that electronic bullying was negatively associated with self-conscious appraisals (Ahmed & Braithwaite, 2004; Craig, Peters, & Konarski, 1998; Menesini & Camodeca, 2008). With respect to electronic victimization, the findings suggest that individuals who have experienced electronic peer victimization may react in ways similar to individuals victimized in other types of relationships (Lyons-Ruth & Block, 1996; Roy, 2005). For example, victims of other forms of violence, such children abused by their parents and individuals who have experienced dating violence, have been described as having difficulties with emotion- and self-regulation similar to the electronic victimization findings of the current study (Lyons-Ruth & Block, 1996; Marx, Heidt, & Roy, Gold, 2005; Sontag, et al., 2011). The imbalance of power in bullying and victimization may be particularly relevant to
regulation in the electronic environment because it is a context where youth build peer relationships without adult supervision. This level of independence may foster even more power in youth who are already powerful, widening the power gap between individuals who electronically bully and those who are victimized. Lack of supervision and the depersonalization that occurs online might also simultaneously increase risk for disinhibition and regulation difficulties. The details of how proximal processes of electronic self-conscious appraisal, cognitive reappraisal, and activational control are related to electronic bullying and victimization are explored below.

**Bullying and Primary Appraisal.** Primary appraisals, such as self-conscious appraisals, serve to regulate social behaviors (Menesini & Camodeca, 2008). Self-conscious appraisals are primary appraisals that encourage people to reflect on how others view their behavior and whether their behavior is in keeping with personal or group standards (Eisenberg, 2000; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). In the current study, electronic bullying was negatively associated with electronic self-conscious appraisal. An individual who has experienced bullying may disregard such appraisals because they are incongruent with their bullying behavior (Martens, 2005). Consistent with this tenet, the General Aggression Model suggests that individuals who bully report fewer internal appraisals, such as self-blame and shame, than uninvolved individuals (Ahmed & Braithwaite, 2004; Georgiou & Stavrinides, 2008; Menesini, et al., 2003). In contrast, bullying is associated with external appraisals, such as blame towards others, which serve to further justify or condone bullying behavior and maintain a position of power (Ahmed & Braithwaite, 2004; Dodge, 2006). This highlights the importance of future research examining externalizing appraisals such as blame in relation to electronic bullying. The online context may make it easier for youth to ignore cues from peers that might otherwise elicit empathy, shame, and remorse in an offline environment. The physical distancing and depersonalization of the electronic context may facilitate attention towards external (blame others) rather than internal appraisals (self-conscious appraisal such as self-blame), thus further exacerbating the lack of self-conscious appraisals found in those who engage in electronic bullying behavior.

**Electronic Victimization and Secondary Appraisal.** Secondary appraisals, such as cognitive reappraisal are part of the emotion regulation process. In the current study, electronic victimization was negatively associated with cognitive reappraisal. This difficulty with emotion regulation associated with electronic peer victimization is consistent with emotion regulation difficulties found in individuals who have
experienced other forms of interpersonal victimization including sexual abuse, family violence, and neglect (Lee, Scragg, & Turner, 2001; Sloan, 2004). Individuals who have experienced trauma and victimization not only perceive their emotion regulation skills differently, but their brains may actually regulate the neurological activation of negative emotions differently (Lang, et al., 2011). The current findings also are consistent with offline peer victimization literature that has identified an association between peer victimization with difficulties with emotion regulation and coping (Hunter & Boyle, 2002; Mahady Wilton, Craig, & Pepler, 2000; Olafsen & Viermo, 2000). The electronic context, with its social distancing (isolation) and the potential to focus on one’s own emotional world, may mean that emotion regulation skills are particularly impacted by electronic victimization experiences (Sherman, 2001).

**Electronic Victimization and Self-Regulation (Activational Control).** In the current study, electronic victimization was associated with poorer self-regulation, as measured by activational control. This link between electronic victimization and poor self-regulation skills is consistent with offline bullying findings demonstrating that offline victimization is associated with difficulty regulating behavior (Dodge, 1991). Similar difficulties with self-regulation and self-regulation also are a known consequence of other forms of victimization and trauma (Aupperle, Melrose, Stein, & Paulus, 2012; Schenkel, Spaulding, DiLillo, & Silverstein, 2005). In the electronic context, the link between victimization experience and activational control may be especially strong. For example, the trauma responses after electronic victimization may be greater than after experiences of offline victimization due to increased number of witnesses and permanency of the information posted online. In addition, activational control difficulties may be more easily activated online because the medium is fast-paced and fosters impulsivity rather than a focus on long-term goals. An alternative explanation is that electronic peer victimization activates a sense of learned helplessness in youth that generalizes not only to feeling helpless in making the electronic bullying stop, but also feeling a lack of agency and motivation towards their goals (i.e., poor activational control). This learned helplessness might be exacerbated online because there is anecdotal evidence that it is often difficult for the electronically victimized individuals to mandate the removal of the electronic material that was the source of victimization (Tettegah, Betout, & Taylor, 2006). This lack of control in repairing and controlling the damage of electronic victimization may add to poorer activational control.
The Specificity of Electronic Bullying and Victimization Findings

The contrast of findings for electronic bullying and victimization suggest that the youths’ reactions to electronic bullying and victimization experiences may be dependent on their position of power during the experience. Individuals with more power (perpetrator of bullying) may look to detach themselves from emotional connection to the experience through lack of identification with self-conscious appraisals. Instead, they may push away an internalization of the experience and potentially choose to externalize the experience by blaming others or their circumstances. In contrast, those in the position of diminished power (victimized individuals) may internalize their experience and develop learned helplessness. This learned helplessness, which is found in individuals who experience chronic victimization, results in self-perceptions characterized by a limited capacity to control one’s own emotions and behaviors (Peterson & Seligman, 1983). Consistent with this tenet, electronic victimization was associated with poorer cognitive reappraisals and activational control skills in the current study. Characterizing individuals who bully as youth who externalize their experiences and individuals who are victimized as internalizers of their experience is also consistent with the literature that individuals who bully experience externalizing mental health symptoms, whereas victimized individuals experience internalizing mental health symptoms (Menesini, Modena & Tani, 2009).

Limitations & Future Directions

Although the current study provides a comprehensive exploratory examination of the proximal processes associated with electronic bullying and victimization, there are some limitations. First, not all of the possible components of the General Aggression Model were examined in the current study. It was beyond the scope of this paper to explore all elements of the model. One component of the General Aggression Model, internal states, may be of particular importance in understanding electronic bullying and victimization. The fast-paced nature of the electronic environment may make automatic responses to situations the most salient aspect of electronic social interactions. Future studies would benefit from observing in vivo social exclusion to assess the internal states component of the General Aggression Model. Predictors of interests may include state rejection cognitions, self-conscious emotion, and physiological arousal. Additionally, situational inputs such as social support, group context, and electronic platform may be important to include as situational inputs associated with involvement in electronic bullying and victimization. A second limitation is that the design of this study was cross-sectional, and, therefore it is not possible to infer causation in the models presented here.
Given the exploratory nature of this early research the cross-sectional design was appropriate; however, future longitudinal studies would enhance understanding of the directionality of effects and would also provide a more accurate understanding or precursors, mediators, and consequences. Third, we failed to account for any developmental differences in the models presented, which would be important to consider in future studies given the developmental differences in electronic bullying and victimization behavior, emotion regulation, and self-regulation skills (Anderson, Anderson, Northam, Jacobs, & Catroppa, 2001; Griezel, Finger, Bodkin-Andrews, Craven, & Yeung, 2012; Zimmermann & Iwanski, 2014). Fourth, the generalizability of these findings is limited given that the sample was limited to primarily normative Caucasian adolescents from a small geographical area. Future replication of these findings in clinical samples and normative samples is required. In addition, the sample size was adequate for obtaining effects for individual relationships, but was lacked the power to appropriately compare complex model structures, thus, future examination of the model comparisons presented here in larger samples would be advisable. Finally, the current study was not able to measure the decision-making component of the General Aggression Model directly. We measured behavioral self-regulation as a skill that fosters thoughtful versus impulsive decision-making, but it would be helpful to measure active decision-making in vivo in social responses in future studies.

**Conclusions**

The current study has highlighted the potential utility of applying the General Aggression Model to the study of electronic bullying and victimization experience, particularly with respect to examining the direct relationship of electronic bullying and victimization with proximal processes. Furthermore, the results support the role of regulatory processes, such as electronic self-conscious appraisals, cognitive reappraisal, and activational control, in electronic bullying and victimization. It is also notable that there was specificity in how these regulatory processes were associated with electronic bullying and victimization. More specifically, electronic bullying was associated with less identification with regulatory cognitive- processes (self-conscious appraisals), while electronic victimization was associated with less use of emotional and behavioral regulatory processes. These regulation difficulties may serve to maintain each individual’s power or lack thereof in the social dynamics of electronic bullying. In addition, characteristics of the electronic environment such as disinhibition of behavior and depersonalization cognitions may further maintain the unhealthy power imbalance and regulation processing deficits associated with electronic bullying and victimization. The
specificity of regulatory processes involved in electronic bullying and victimization may have important clinical application in future. With additional support from future literature, the results presented here may be able to support the need for cognitive regulation skills in youth involved in electronic bullying and emotional and behavioral regulation skills for those involved in electronic victimization. In sum, this study is integral in developing a comprehensive, theoretically driven model of electronic bullying and victimization.
References


doi:10.1080/0013188022000031614


Runions, K. C. (2013). Toward a conceptual model of motive and self-control in cyber-aggression: Rage,


Suler, J (2004). The online disinhibition effect. Cyber Psychology & Behavior, 7 (93), 321-326. doi:10.1089/1094931041291295


Valkenburg, P. M. & Peter, J. (2011). Online communication among adolescents: An integrated model of
its attraction, opportunities, and risks. *Journal of Adolescent Health, 48*, 121-127. doi:
http://dx.doi.org/10.1016/j.jadohealth.2010.08.020

context: Direct and indirect effects by low self-control across 25 European countries. *European
Journal of Developmental Psychology, 9*(2), 210-227. doi:10.1016/j.jadohealth.2009.03.021

Wachs, S. (2012). Moral disengagement and emotional and social difficulties in bullying and
cyberbullying: Differences by participant role. *Emotional and Behavioural Difficulties, 17* (3-4),
347-360. doi:10.1080/13632752.2012.704318

doi:10.1016/j.jadohealth.2009.03.021

adolescents with ADHD and the impact on quality of life. *Journal of Adolescent Health, 46*, 209-
217. doi: 10.1016/j.jadohealth.2009.09.009

Adolescent Health, 41*(6), S14-S21. doi:10.1016/j.jadohealth.2007.08.018

victims of bullying: Characteristic expressions of affect, coping styles and relevant contextual

Statistical Planning and Inference, 139*(2), 350-365. doi:10.1016/j.jspi.2008.03.039

Ybarra, M.L. & Mitchell, K.J. (2004). Youth Engaging in online harassment: Associations with caregiver-
doi: 10.1016/j.adolescence.2004.03.007

and middle adulthood Age differences, gender differences, and emotion-specific developmental
variations. *International Journal of Behavioral Development, 38*(2), 182-194. doi:
10.1177/0165025413515405
Chapter 3

A Trauma Model of Electronic Bullying and Victimization

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Abstract

Previous electronic bullying and victimization research has primarily been either atheoretical or based on a social information-processing model. The current study tests the Anxious Apprehension Model of Trauma to explore physiological arousal, emotional responses, rejection cognitions, and moral disengagement attitudes associated with traumatic electronic bullying and victimization experiences. One hundred and forty youth provided a self-report of their emotionality, experiences of shame, and moral disengagement attitudes. They were then exposed to a social exclusion paradigm while their heart rate was monitored and were then asked to rate their experience of state rejection and state self-conscious emotion. A regression analysis was conducted to examine whether electronic bullying and victimization were associated with changes in heart rate for males and females. Two separate structural equation models (SEM) were used to explore mediation models of electronic bullying and victimization separately. Electronic victimization predicted higher changes in heart rate, whereas electronic bullying in male youth predicted lower changes in heart rate during social exclusion. Rejection cognitions mediated the relationships between electronic bullying and victimization with emotionality and state self-conscious emotion. Rejection cognitions also mediated the relationship between electronic bullying and moral disengagement attitudes. Findings are consistent with the Anxious Apprehension Model of Trauma. Clinical implications regarding the potential utility of cognitive interventions and strategies to manage physiological arousal are explored. Future longitudinal research is needed to provide improved causal evidence of the correlational pathways observed in this study.
Introduction

Bullying and victimization in youth has often been studied from a social information-processing framework, which differs from other models of interpersonal violence (Jones & Barlow, 1990; Lemerise & Arsenio, 2000). Interpersonal violence such as child abuse, neglect, sexual assault, and dating violence largely have been explored through a trauma framework (Kendall-Tackett, Williams, Finkelhor, 1993; Massaro, 1984). Trauma models postulate that interpersonal violence is a trauma that is associated with an immediate fear response followed by maladaptive social cognitions and increased physiological and emotional arousal (Jones & Barlow, 1990). The Anxious Apprehension Model of Trauma posits that maladaptive cognitions are the core contributor of the persistence of physiological and emotional arousal following trauma (Jones & Barlow, 1990). The current study aimed to examine the physiological, emotional, and social cognitive correlates of electronic bullying and victimization, through the lens of the Anxious Apprehension Model of Trauma.

Trauma theories such as the Anxious Apprehension Model of Trauma (Figure 1) are particularly helpful in understanding the processes underlying bullying and victimization for several reasons. First, bullying is a specific subtype of trauma that occurs in the context of peer interactions (Leymann & Gustavson, 1996). There is evidence that physiologically, youth’s brain and hormones respond similarly to peer victimization and various forms of trauma (Gunnar, Sebanc, Tout, Donsella, & van Dulmen, 2003; Vallaincourt, Clinton, McDougall, Schmidt, & Hymel, 2010). Second, bullying and trauma share similar cognitive, behavioral, and emotional consequences. For example, employees victimized by workplace bullying and school bullying show clinically significant Post Traumatic Stress Disorder (PTSD) symptoms, such as intrusive thoughts, behavioral avoidance of trauma-related stimuli, and emotion dysregulation (difficulties regulating emotions; Idsoe, Dyregrov, & Idsoe, 2012; Matthiesen & Einarsen, 2004; Rodriguez-Munoz, Moreno-Jimenez, Sanz Vergel & Garrosa Hernandez, 2010; Tehrani, 2004). Third, many of the same physiological, emotional, and cognitive structures predict poor psychosocial outcomes after both bullying and other forms of trauma. For example, increased cortisol levels, greater shame attributions, and changes in cognitions about the world being a “just” place have been associated with poorer outcomes in those who have been bullied and those who have experienced trauma such as sexual and physical abuse (Beck, et al., 2013; Correia & Dalbert, 2008; Ehlert, 2013; Everly & Lating, 2004; Menesini & Camodeca, 2008; Ouellet-Morin et al., 2011).
Although victimization as a result of bullying has been examined as a subtype of trauma extensively in the workplace victimization literature and to a lesser extent with respect to school victimization, there is sparse literature that has studied a trauma model from the perspective of the bullying perpetrator (Carney, 2008; Matthiesen & Einarsen, 2004; Rodriguez-Munoz et al., 2010; Tehrani, 2004). Despite the paucity of research, a large proportion of those who bully also have been victimized by bullying and have experienced trauma within the family or the community (Baldry, 2003; Duncan, 1999; Ybarra, Diener-West, & Leaf, 2007). Furthermore, bullying is a shared interpersonal experience between the perpetrator and individual victimized, which may produce a shared experience of trauma through a shared social rejection interaction (Craig & Pepler, 2007). Those that are victimized feel rejected by the behaviors of the perpetrator and we posit that those who bully also experience anticipatory rejection when they enter social situations and behave in manners to reduce the impact of that rejection by preemptively initiating rejection by bullying. Consistent with this hypothesis is the finding that reactive aggression is increased in individuals who expect to be rejected and are anxious about rejections (Zimmer-Gembeck & Nesdale, 2013). We argue that both this internal experience of anticipatory
rejection and actual rejection after bullying occurs can cause distress, thus we conceptualize bullying perpetration as a traumatic experience. Furthermore, we propose that the physiological, emotional, and cognitive consequences of bullying (or aggression) and trauma are similar for those who are victimized and those who perpetrate the bullying. For example, cortisol levels, emotion reactions, and beliefs are altered in both individuals who bully and those who have experienced trauma (Beck et al., 2013; Correia & Dalbert, 2008; Ehlert, 2013; Everly & Lating, 2004; McBurnett, Lahey, Rathouz, & Loeber, 2000; Olthof, 2012). The current study will use the Anxious Apprehension Model of Trauma as a framework for understanding bullying perpetration.

**Anxious Apprehension Model of Trauma and Electronic Victimization**

The trauma framework may be particularly relevant to victimization and bullying in online environments because characteristics of the online medium might heighten traumatic reactions. For example, the widespread, rapid transmission of electronic messages may serve to re-victimize or trigger re-experiencing when victimized youth watch as peers share and comment on the trauma they have experienced. In addition, the characteristics of the electronic context may also influence the physiological, emotional, and cognitive processes associated with trauma in the Anxious Apprehension Model of Trauma (Idsoe et al., 2012). For instance, the immediacy, large audience, and permanency of embarrassing information in the online context may influence physiological and emotional responses associated with electronic bullying and victimization (Derks, Fischer, & Bos, 2008; Martin, Coyier, VanSistine, & Schroeder, 2013; Mauri, Cipresso, Balgera, Villamira, & Riva, 2011). In addition, the absence of nonverbal cues may increase the likelihood of rejection cognitions that we have postulated to be associated with electronic bullying and victimization. The current research tested this trauma model by examining the physiological arousal, emotional responses, and cognitions associated with electronic bullying and victimization (see Figure 2). More specifically, we maintain a particular focus on state physiological, emotional, and cognitive responses to social exclusion and how those state (situational) reactions are associated with trait (dispositional) emotionality and cognitions as well as electronic bullying and victimization.
Physiological Regulation. Altered physiology is an important initial reaction to trauma and one of the most prolonged and distressing symptoms experienced by those who have encountered trauma (van der Kolk, 2003). There are competing theories of how physiology relates to trauma experiences. Some researchers theorize that individuals experience a numbed physiological reaction as a result of ongoing trauma (van der Kolk & Saporta, 1991). Others argue that physiological arousal increases for a span of time after a trauma and later becomes numbed (Delahanty & Nugent, 2006; Shalev, et al., 1998). These studies of trauma; however, have examined physiological arousal in response to innocuous stimuli or stressors unrelated to the trauma, such as giving a public speech. The Anxious Apprehension Model of Trauma suggests that an individual who has undergone trauma in the past is more likely to experience physiological changes when encountering situations that simulate or resemble the past trauma (Cohen et al., 1998). In the offline peer victimization literature, there is evidence that youth with chronic peer victimization histories demonstrate decreased physiological arousal in the face of physical pain, while simultaneously exhibiting higher physiological arousal in response to social stressors (Eisenberg, Jarchow, Lieberman, & Naliboff, 2006; Hamilton, Newman, Delville, & Delville, 2008). In the current study, we examined the physiological response to a social stressor, social exclusion, thus we would expect to observe increases in physiological response following social exclusion for victimized individuals. Furthermore, increased physiological arousal is more likely to occur in online contexts when compared to offline contexts. For example, Facebook use increases physiological responses, such as skin conductance, respiratory activity and heart rate (Mauri, et al., 2011). Thus, we would expect increased physiological arousal to be associated with electronic victimization specifically. In addition, there are gender differences in the state
physiological response of those who have been victimized, such that males who have been victimized offline show lower resting heart rate when compared to women (Hamilton et al., 2008). Although this literature does not have direct implications for heart rate during social exclusion, it provides the best literature to date to identify gender differences that may exist. Thus, in the current study, we hypothesized that females would experience a stronger relationship between electronic victimization and increased state physiological arousal than males. In addition, we predicted that rejection cognitions would mediate the relationships between electronic victimization and changes in heart rate during social exclusion. This prediction is consistent with the Anxious Apprehension Model of Trauma as well as offline literature suggesting that physiological stress response is linked to rejection sensitivity cognitions in individuals with poor social support (Eisenberger, Taylor, Gable, Welch, & Lieberman, 2007).

Changes in physiological arousal also are likely to be involved in electronic bullying perpetration, albeit different in nature than the relationship with electronic victimization. Lower baseline physiological arousal and physiological numbing has been associated with perpetration of offline bullying (Bernstein & Claypool, 2012; Lorber, 2004). The tendency to depersonalize in the electronic context may enhance this association between lower physiological arousal variability and electronic bullying (Walther, 1996). In the current study, we predicted that electronic bullying would be negatively associated with changes in heart rate during social exclusion. We also predicted that changes in heart rate during exclusion would be more strongly negatively associated with electronic bullying in males than females because offline aggression literature has demonstrated a stronger link between physiology and aggression in male youth versus female youth (Beauchaine, Hong, & Marsh, 2008). Finally, we predicted that rejection cognitions would mediate the relationships between electronic bullying and changes in heart rate during social exclusion. This prediction is consistent with the Anxious Apprehension Model of Trauma and offline literature suggesting that numbed physiological response is most strongly associated with relational aggression in girls who hold rejection cognitions (Sijtsema, Shoulberg, & Murray-Close, 2011).

**Emotion.** The Anxious Apprehension Model of Trauma also describes experiences of emotion arousal following trauma. Individuals with a trauma history experience greater emotionality in general as well as more self-conscious emotions (Lee, Scruggs, & Turner, 2001; Sloan, 2004). These individuals’ past trauma experiences also make them primed for state emotion arousal in general (Goldsmith & Freyd, 2005; Sloan,
Consistent with the Anxious Apprehension Model of Trauma, those who perpetrate bullying offline also experience changes in emotional arousal, particularly with respect to trait emotionality and state self-conscious emotions (Ahmed & Braithwaite, 2006; Menesini & Camodeca, 2008; Terranova, Morris, & Boxer, 2008). Offline bullying research has identified that high emotionality and low self-conscious emotions are associated with bullying perpetration (Ahmed & Braithwaite, 2006; Menesini & Camodeca, 2008; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995). The electronic environment provides a uniquely challenging context for emotionality and self-conscious emotion in those who perpetrate bullying. First, the absence of emotion cues from others online results in a dependence on one’s own emotional cues primarily, which can further intensify youths’ emotionality (Matheson & Zanna, 1988; Sproull & Kiesler, 1986). The physical distance from social partners may also facilitate more victim blaming and reduce youths’ capacity to experience self-
conscious appraisals because they do not directly see the facial expressions and emotional responses of their social partners. Consequently, we hypothesized that electronic bullying would be positively associated with trait emotionality and negatively associated with state self-conscious emotions, such as shame and embarrassment. Furthermore, we hypothesized that rejection cognitions would mediate these relationships. This second hypothesis is consistent with findings that offline aggression is associated with increased rejection cognitions that accompany anger emotions in response to peer rejection (London, et al., 2007).

Rejection Cognitions and Moral Disengagement. According to the Anxious Apprehension Model of Trauma, cognitive schemas become altered after interpersonal trauma, particularly individuals’ cognitions regarding self, others, and the world (Harvey, Dorahy, Vertue, & Duthie, 2012). The model also posits that these cognitions are the mechanism through which trauma produces physiological and emotional hyper-arousal (Harvey et al., 2012). For example, childhood trauma literature has confirmed that disruptions in children’s cognitions of safety and connection in their relationship with their parents are common after experiences of trauma (Styron & Janoff-Bulman, 1997). Similarly, involvement in bullying is associated with increased interpersonal threat cognitions (Pornari & Wood, 2010). Thus, perceptions of rejection in relationships are likely salient cognitions associated with bullying and victimization and they may be particularly salient in the electronic environment. Youth may be in a position of increased vulnerability for victimization online as a result of sharing more personal information and norms that support saying and doing things that would be unacceptable offline (Joinson, 2001). This position of vulnerability may also make youth more vigilant to signals that they are being rejected. In addition, increased ambiguity of social cues may increase reliance on cognitive biases such as rejection cognitions (Dodge & Tomlin, 1987; Sherman, 2001). These contextual factors may amplify maladaptive rejection cognitions for those victimized in the electronic context, while simultaneously increasing emotion responses for the reasons stated above. Given that the Anxious Apprehension Model of Trauma places social cognitions, such as rejection cognitions, as the core mechanism for physiological and emotional hyper-arousal, the current study examined the indirect relationship of electronic victimization with physiological and emotional responding (states changes in heart rate, trait emotionality, state changes in self-conscious emotion, and trait shame) through state rejection cognitions.

Those who electronically bully may also experience changes in rejection cognitions. Similar to youth victimized offline, those who perpetrate offline aggression experience disruptions in their view of others,
resulting in a sensitivity to peer rejection (Zimmer-Gembeck & Nesdale, 2013; London, et al., 2007). Thus, we predicted that state rejection cognitions would mediate the relationship that electronic bullying has with physiological and emotional responding. In addition to these cognitions of peer rejection, youth who electronically bully hold other cognitions, such as attitudes justifying amoral behavior (moral disengagement) more than those who do not bully (Pornari & Wood, 2010). The Anxious Apprehension Model of Trauma provides a potential explanation of this relationship by suggesting that negative peer interactions (trauma) triggers changes in cognitions about others (increased rejection cognitions), which then generalize to cognitions about the world (moral disengagement; Harvey et al., 2012). For example, negative peer interactions (electronic bullying) may be associated with a greater likelihood of youth interpreting others’ responses as rejection, which then fosters justifying their amoral bullying behaviors because they identify them as necessary to protect against state perceived rejection. The role of rejection cognitions in the relationship between electronic bullying and moral disengagement may be particularly important because the ambiguity of online social cues fosters reliance on cognitive biases (Dodge & Tomlin, 1987; Sherman, 2001). We predicted that rejection cognitions were the mechanism through which electronic bullying actions and moral disengagement attitudes were related in the current study.

The current study examined electronic bullying and victimization using the Anxious Apprehension Model of Trauma, positing a relationship between electronic bullying/victimization histories and state physiological responses, state emotion responses, state rejection cognitions, and trait emotionality. To examine state physiological arousal, emotion responding, and cognitions, youth participated in a Cyberball game where they were excluded from an online ball game while responses in these domains were monitored. We examined whether electronic bullying and victimization were associated with trait emotionality, state self-conscious emotions, and physiological arousal through the indirect effect of state rejection cognitions. In addition, we examined the indirect effect of rejection cognitions on the relationship between electronic bullying and moral cognitions, as well as the indirect effect of rejection cognitions on the relationship between electronic victimization and trait shame. The current study will provide a novel application of the Anxious Apprehension Model of Trauma to the study of electronic victimization and bullying.
Methods

Participants

One hundred and eight-two youth aged 12 to 17 were recruited from a database of youth who had provided parental consent to participate in ongoing research at a university. Youth were also recruited through a second database drawn from a subsample of youth who participated in the survey outlined in Study 1. Of the 182 youth who participated, 140 youth remained in the data set when youth with incomplete data were removed. Attrition analyses revealed that those remaining in the analyses did not significantly differ from those removed due to incomplete data on any of the variables analyses in the current study ($p < .01$). The final sample consisted of 66 males and 74 females. A majority of the sample was between age 12 and 13 years (71%) and the remaining 29% of the sample were between age 14 and 17 years.

Procedures

Parents were given a letter of information and consent form. Youth were then provided a verbal explanation of the study and asked to assent to participation. Youth completed questionnaires on demographics and social and emotional functioning. The participants remained seated in a comfortable chair in a room with video cameras that were monitored from an adjacent room. Physiological sensors were applied to the youth by a female experimenter. Two sticker electrodes for the electrocardiogram (ECG) recording were placed just below the right collarbone and below the left rib in a Lead-II configuration. Electrocardiogram (ECG) sensors connected to a battery pack and BioPac systems MP150 amplifier, which sent signals to a computer that records the data using AcqKnowledge, measured youth’s heart rate in beats per minute. Youth were given a brief period to relax and allow the equipment to stabilize.

Once the equipment was stabilized, the following sequence occurred: (1) Baseline (3 Minutes) – participant sat quietly with no stimulation; (2) Speech (3 Minutes) – participant was instructed to make a speech as if to a panel of experts on any topic he/she chose; (3) Self-Report (1 minute) – reported feelings during the speech on Likert scales; (4) Recovery (3 Minutes) – participant sat quietly with no stimulation; (5) Cyberball (2 Minutes) – a social exclusion task virtual ball toss game; (6) Self-Report (1 minute) – reported feelings during Cyberball on the state self-conscious emotion and rejection cognition scale; (7) Video Self-Appraisal (3 minutes) – participant rated his/her own feelings during the speech; (8) Post-consent – participants complete a final consent form and are debriefed. For the current study, only data from baseline (1),
Cyberball (5), and Self-reported emotions after Cyberball (6) were analyzed. During the Cyberball activity participants were asked to play a game with two youth who were playing at other universities. Participants were shown pictures of the “youth” (attractive same-aged peers of male and female gender) and were told that they would be playing the game with these youth. Participants were told that the purpose of the study was to explore mental visualization. In reality, there were no other participants playing the ball toss game. The game’s programming was set to toss the ball to the participant two times in the first three tosses. For the remaining two minutes the participant was no longer included in the game, watching the three “peers” throw the ball between them. This paradigm has been shown to effectively elicit social exclusion (Williams & Jarvis, 2006) Youth were debriefed, specifically explaining that the ball game was played with a computer program rather than genuine peers. Data collection and the treatment of participants complied with APA Ethical Principles (see Appendix D for ethics approval).

Measures

The majority of the constructs were based on self-report, with the exception of physiological measurements of heart rate during a social exclusion paradigm and a measurement of each adolescent’s Body Mass Index (BMI). Principal components analysis was used to confirm the structure of each measure. Alpha was used as the measure of reliability, which are reported in Table 1.

Demographics. Youth provided their age and gender via self-report (males = 0, females = 1). In addition, participants’ height and weight were measured from which a body mass index was calculated and included as control variable when examining physiological responses. BMI was calculated based on the following formula: \( m \text{ (kg)} / \text{height (m)}^2 \).

Electronic Bullying and Victimization. Youth were given a definition of bullying and examples of electronic bullying. Next, they were asked whether they had experienced electronic bullying and whether they had engaged in electronic bullying towards others within the last four weeks on a 5 point scale ranging from “never” to “two or more times.” High scores represented a high frequency of electronic bullying and victimization experiences, respectively. These items were derived from the Olweus Bullying and Victimization Survey (1986, 1996).

Moral Disengagement. Moral disengagement was initially meant to be measured using an electronic specific measure of moral justification; however the newly created measure demonstrated poor
validity and reliability. Instead, moral disengagement was measured using a four-item Moral Justification subscale of the Moral Disengagement Scale (Bandura, et al., 1996). The Moral Justification subscale assessed the degree to which adolescents were willing to use intellectual arguments and cognitive restructuring to condone immoral actions. The questions on the scale asked youth to rate statements such as “It’s ok to fight to protect your friends” from “I disagree” to “I completely agree” (4-point scale; Bandura, et al., 1996). Higher scores on this scale represent stronger tendency to morally disengage. The four-item subscale accounted for 53% of the variance among responses (component loading ≥ 0.70).

Electronic Emotionality. Participants’ trait emotionality while online was measured using two items based on the Emotion Reactivity Scale (Nock, Wedig, Homberg, & Hooley, 2008). The questions asked participants to rate the two statements “people say I over-react to what people say to me online” and “I feel very ‘on edge’ when I am online” on a 5-point scale from “not at all true about me “ to extremely true about me.” Higher scores on this scale represent greater emotionality. The scale accounted for 58% of the variance between the two items (component loadings ≥ 0.76).

State Self-Conscious Emotion. (Appendix E). Before and after the completion of the Cyberball exclusion simulation task participants rated their feelings of self-conscious emotion such as embarrassment and shame, in the current moment on a 10-point scale from “I did not feel that at all” to “I felt that way completely”. The mean of these emotion ratings during cyberball was subtracted from emotion ratings before the cyberball paradigm. High scores on this measure represented increases in emotion following cyberball and low (negative) scores represented suppression of emotion following cyberball. The four-item scale of self-conscious emotion accounted for 63% of the variance among items (component loading ≥ 0.70).

State Rejection Cognitions. Youth’s rejection cognitions were measured using three-item scale that was administered after completion of the Cyberball simulation. Youth were asked to respond on a 10-point scale from “I did not feel that at all” to “I felt that way completely” in response two questions: “how rejected did you feel now?” and “Did you feel rejected while playing the game?” (post-cyberball). In addition, youth were asked to respond from “included” to “excluded” to a third question: “Did you feel included or excluded in the game of catch.” High scores on this measure represent greater perceived rejection to cyberball paradigm. The three items of the rejection cognition scale accounted for 52% of the variance among items (component loadings ≥ 0.72).
**Trait Experience of Shame.** Fourteen questions from the Experience of Shame Survey (Andrews, Qian, & Valentine, 2002) were used to measure three components of trait shame: characterological shame, hiding, and social shame. Participants were asked to respond on a 4-point scale from “not at all” to “very much” to questions such as, “have you felt ashamed of your abilities?” In the current study, one component accounted for 50% of the variance among the 14 items (component loading ≥ 0.67). Higher scores on the scale represented greater experience of shame.

**Heart Rate.** Heart rate (HR) was calculated as number of beats per minute from the raw ECG signal. The primary index of arousal used was the heart rate percent change between the period of time from baseline to the 70-80 second interval during the simulation: Average HR during the 70-80 second time interval minus average heart rate during baseline divided by baseline and multiplied by 100 ([Cyberball (70-80sec) - Baseline]/Baseline]*100). The time-span was chosen for two primary reasons. First, we wanted to examine automatic, reflexive physiological responses to the initial moment of exclusion, which are typically impacted by those who experience trauma (McTeague, et al., 2010). Second, studies that take the average or variability of the entire cyberball experience do not find any effects for heart rate; however, studies that choose a definitive “exclusion” period have demonstrated consistent physiological changes in response to social exclusion (Shahrestani, Stewart, Quintana, Hickie, & Guastella, 2015). As such, we followed procedures from previous cyberball paradigms that have used the 10-second interval during which the largest number of participants demonstrated the largest shift in heart rate from baseline as the interval most consistent with a reflexive response to social exclusion (Iffland, Sansen, Catani, & Neuner, 2014; Zadro, Boland, & Richardson, 2004). In the current sample, the largest shift in heart rate from baseline occurred for the largest number of individuals in the 70-80 second interval, which was the nest estimate of heart rate at the moment of exclusion for the majority of participants.

**Results**

Table 1 displays the correlations among variables of study in the regressions and structural equation models below. Table 1 also displays descriptive statistics for variables included in this analysis including gender, age, BMI, electronic bullying, electronic victimization, change in heart rate, rejection cognitions, change in state self-conscious emotion, trait emotionality, moral justification, and trait shame. As shown in Table 1, state rejection cognition, state self-conscious emotion, trait emotionality, and trait shame were
positively correlated with one another. In contrast, change in heart rate was not correlated with the other variables. Independent t-tests indicated that gender differences existed for the trait shame variable only, with females reporting higher levels of shame than males (t (133) = 3.73, p < .001).

Data screening boxplot procedures indicated several univariate outliers in age, BMI, electronic victimization, and bullying. These variables were transformed using Winsor procedures (Tukey, 1962); however, electronic bullying and victimization continued to demonstrate univariate outliers and non-normality. When screening for multivariate outliers, electronic bullying and victimization had six cases with unacceptable Mahalanobis distances that were consistent with the univariate outliers that remained in the transformed electronic bullying and victimization measures ($\chi^2 (7) = 24.58, p < .001$). Outliers are commonplace in the bullying and victimization literature because these behaviors, by nature, are found in only a small portion of the population. Within that small proportion of youth are often involved in frequent and chronic bullying and victimization, meaning that there will be only a few very high scores on bullying and victimization scales with all other scores in the population being generally low within a normative population. As such, these transformed outliers were retained in the analysis. No problems with singularity, multicolinearity, or the distributions of residuals were observed. All continuous variables that were used to create interaction terms were centered on the mean to reduce multicolinearity among independent variables and interactions.
# Table 1

**Correlations Among All Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>BMI</th>
<th>Elec Bully</th>
<th>Elec Vict.</th>
<th>Δ State HR</th>
<th>State Rejection Cognitions</th>
<th>Δ State Self-Conscious Emotion</th>
<th>Trait Emotionality</th>
<th>Moral Justif.</th>
<th>Trait Shame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.19*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elec. Bully</td>
<td>.11</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elec. Vict.</td>
<td>.03</td>
<td>-.10</td>
<td>.68***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ State HR</td>
<td>.02</td>
<td>.01</td>
<td>.11</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Rejection Cognitions</td>
<td>.05</td>
<td>-.17</td>
<td>.18*</td>
<td>.18*</td>
<td>-.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ State Self-Conscious Emotion</td>
<td>-.03</td>
<td>-.06</td>
<td>.17</td>
<td>.21*</td>
<td>.01</td>
<td>.45***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Emotionality</td>
<td>-.07</td>
<td>-.12</td>
<td>.22***</td>
<td>.38*</td>
<td>-.00</td>
<td>.28**</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral Justif.</td>
<td>.09</td>
<td>.00</td>
<td>.07</td>
<td>.04</td>
<td>-.01</td>
<td>.24**</td>
<td>-.13</td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Shame</td>
<td>0.14</td>
<td>0.06</td>
<td>.17*</td>
<td>0.26***</td>
<td>-.06</td>
<td>.19*</td>
<td>.04</td>
<td>0.18*</td>
<td>.04</td>
<td></td>
</tr>
</tbody>
</table>

Mean: 13.61 20.32 1.07 1.17 -0.75 5.07 0.31 1.44 2.28 1.60
(SD): (1.12) (3.92) (0.34) (0.59) (4.41) (2.32) (1.16) (0.63) (0.80) (0.49)
Reliability (α): .82 .86 .73 .77 .79

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

Electronic Bullying and Victimization Predicting Physiological Arousal

A multiple linear regression was conducted to determine whether bullying and victimization predicted changes in heart rate during social exclusion. In addition, interactions of gender and bullying and victimization also were examined as predictors of changes in heart rate. Finally, BMI was entered into the regression as a control variable given previous literature (Silvetti, Drago, & Ragonese, 2001). Table 2 shows that electronic victimization, electronic bullying, and the interaction of electronic bullying and gender each predicted a change in heart rate, $R^2 = .12$. Although electronic victimization was positively associated with changes in heart rate for all participants, electronic bullying was negatively associated with changes heart rate during the Cyberball task. Figure 3 demonstrates the nature of the gender-moderated effect on the relationship between electronic bullying and change in heart rate. There was no significant relationship between electronic bullying and change in heart rate for females ($B = 2.35, t = 1.37, p = 0.17$); however, there was a significant negative relationship between electronic bullying and heart rate in males ($B = -8.85, t = -2.57, p = 0.01$).

Table 2

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$SE$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.53</td>
<td>2.63</td>
<td>-0.20</td>
</tr>
<tr>
<td>Gender (males = 0)</td>
<td>-0.32</td>
<td>0.38</td>
<td>-0.83</td>
</tr>
<tr>
<td>BMI</td>
<td>0.06</td>
<td>0.10</td>
<td>0.63</td>
</tr>
<tr>
<td>Electronic Bullying</td>
<td>-3.37</td>
<td>1.638</td>
<td>-1.81*</td>
</tr>
<tr>
<td>Electronic Victimization</td>
<td>1.72</td>
<td>0.689</td>
<td>1.82*</td>
</tr>
<tr>
<td>Gender X Electronic Bullying</td>
<td>5.71</td>
<td>1.94</td>
<td>2.95**</td>
</tr>
<tr>
<td>Gender X Electronic Victimization</td>
<td>-1.47</td>
<td>0.98</td>
<td>-1.49</td>
</tr>
</tbody>
</table>

* $p < .05$  
** $p < .01$  
*** $p < .001$
Rejection Cognitions Mediating Relationship of Electronic Victimization and Bullying with Proximal Processes

Two separate structural equation models (SEM) were used to evaluate rejection cognitions as the mediator of the relationship of bullying and victimization with state physiological responses, state self-conscious emotion responses, trait emotionality, and moral justification. Originally, electronic bullying and victimization were to be examined in one comprehensive model; however the correlation between the two ($r = .68$) reduced the remaining variability in the electronic bullying variable, which had low variability before any modeling constraints were introduced ($var = .07$). As a result, bullying and victimization were examined separately, with overlapping findings between victimization and bullying being interpreted with caution. In addition, the low variance in the electronic bullying variable reduced the generalizability of findings for bullying specifically. In the electronic bullying model, rejection cognitions were examined as a mediator of the relationship between electronic bullying and moral justification, emotionality, change in self-conscious emotion, and change in heart rate. With respect to electronic victimization, rejection cognitions were examined as a mediator of the relationship of electronic victimization with trait emotionality, trait shame, changes in state self-conscious emotion, and changes in heart rate. Gender was included as a control variable within the mediation and BMI was used as a control variable in the part of the mediation involving the
change in heart rate as the outcome variable. Each of these averaged variables was added to the model as measured variables. Age was not correlated with any of the variables of interest, and was removed from consideration as a control variable in each model. Mediation models were interpreted only if they demonstrated adequate fit on two out of three fit indices (Hoyle & Panter, 1995). Fit statistics used to judge adequate fit were Root Mean Square Error of Approximation (RMSEA < .07; Steiger, 2007), Comparative Fit Index (CFI > .9; Byrne, 1994), and Standardized Root Mean Square residual (SRMR < .08; Browne & Cudeck, 1993). The indirect effects of mediators were evaluated using bias corrected Maximum Likelihood Bootstrapping.

The mediation model for electronic bullying had acceptable fit and was appropriate to interpret ($\chi^2 (12) = 18.91, p = 0.09; \text{RMSEA} = 0.07; \text{CFI} = 0.91; \text{SRMR} = .05$). Figure 4 displays the significant paths of the electronic bullying model. Bootstrapping results indicated that there was a significant indirect effect of rejection cognitions on the relationship between electronic bullying and state changes in self-conscious emotion, electronic bullying and trait emotionality, as well as electronic bullying and moral justification ($p = .01, p = .02$, and $p = .02$, respectively).
Figure 4. Rejection Cognitions Mediating the Relationship of Electronic Bullying with Internal States and Proximal Processes

![Diagram showing the relationship between electronic bullying, rejection, moral justification, electronic emotionality, self-conscious emotion, and heart rate change.]

* < .05  
** < .01  
*** < .001

Note: Standardized Total Effect (Standardized Direct Effect)

Gender remained in the model predicting all outcome and mediator variables; however from simplicity they have been omitted from the figure. Gender significantly predicted moral justification only ($r = -.34, p < .01$).

The mediation model for electronic victimization had acceptable fit and was appropriate to interpret $\chi^2 (12) = 15.57, p = 0.21$; RMSEA = 0.05; CFI = 0.96; SRMR = .05). Figure 5 displays similar statistically significant indirect effect of rejection cognitions on the relationship between electronic victimization and state changes in self-conscious emotion as well as the relationship between electronic victimization and trait emotionality ($p = 0.03$ and $p = .02$, respectively).
Figure 5. Rejection Cognitions Mediating the Relationship of Electronic Victimization with Internal States and Proximal Processes

Discussion

The current study applied the Anxious Apprehension Model of Trauma to the study of electronic bullying and victimization. More specifically, we examined the physiological, emotional, and cognitive trauma processes associated with electronic victimization and bullying involvement. Findings demonstrated relationships among between electronic victimization and bullying histories with state physiological changes. For example, there was a positive relationship between electronic victimization and changes in heart rate after social exclusion and a negative relationship between electronic bullying and changes in heart rate in males after social exclusion. Second, findings suggested a positive relationship among electronic
bullying, victimization, and state self-conscious emotion and trait emotionality. Third, results suggested that rejection cognitions were a mechanism through which electronic bullying and victimization were related to state self-conscious emotions and trait emotionality. Fourth, we found that rejection cognitions mediated the relationship between moral disengagement and electronic bullying. Taken together, our results support future application of the Anxious Apprehension Model of Trauma to the study of electronic bullying and victimization intervention.

**Physiological Regulation**

The Anxious Apprehension Model of Trauma posits that dysregulated physiological arousal is one of the first notable symptoms of trauma (van der Kolk, 2003). Consistent with the Anxious Apprehension Model of Trauma, electronic victimization experiences were related to higher changes in heart rate in response to social exclusion in the current study. This experience of social exclusion likely triggers a memory of past rejection experience, resulting in higher changes in physiological arousal consistent with the trauma-related fight or flight response (Perry, 2001). In contrast, male youth demonstrated a negative relationship between electronic bullying and changes in heart rate in response to social exclusion. The contrasting results for victimization and bullying are consistent with findings from the offline bullying literature that has linked victimization to increased physiological arousal and bullying to decreased or, numbing of, physiological arousal in the face of social stressors (Bernstein & Claypool, 2012; Eisenberger, et al., 2007; Hamilton, et al., 2008; Lorber, 2004). In the past, offline bullying researchers have explained these discrepancies in physiological arousal between offline victimized and bullying youth as resulting from the difference between trauma experiences for victimized individuals and antisocial personality qualities in those who bully (Bollmer, Harris, & Milich, 2006; Lorber, 2004). Physiological numbing; however, is not unique to perpetrators of bullying, but it is also found in individuals who have experienced chronic trauma and chronic victimization (Hamilton et al., 2008). For example, increased physiological responding has been identified as the immediate response to victimization and trauma (Delahanty & Nugent, 2006; Shalev, et al., 1998). In contrast, decreased physiological response (numbing) has been associated with chronic and historical victimization and trauma experiences (van der Kolk, 2003; van der Kolk & Saporta, 1991). In the current study, the positive association between electronic victimization and changes in physiological arousal in response to social exclusion can be interpreted as hyper arousal that occurs immediately after trauma. The
negative association of electronic bullying with change in physiological reaction to social exclusion could be interpreted as numbing associated with chronic and historical trauma events. It is beyond the scope of this study to explore the physiological numbing process of trauma in youth who electronically bully; however, we hope that future research will explore bullying from a lens of trauma as a competing model with the antisocial model of bullying. We posit that individuals who bully may: a) have their own experiences of victimization in other contexts, such as in the home or other offline environments that contribute to this numbed physiological response; and b) experience a chronic form of trauma and distress in response to their own bullying actions (Baldry, 2003; Duncan, 1999; Ybarra et al., 2007). For example, those who bully may experience the distress of anticipatory rejection, which results in electronic bullying behavior, and after the incident they may reflect on the harm and upset they have caused another (Zimmer-Gembeck & Nesdale, 2013). This dual experience of rejection may mean that one bullying incident could result in distress that is chronic and relived.

**Emotion**

In addition to physiological regulation, emotion responses were associated with electronic bullying and victimization. More specifically, both electronic bullying and victimization were positively associated with increases in state self-conscious emotion after social exclusion and high trait emotionality. Victimized youth may be hypervigilant to internal and environmental emotion cues because of a perceived lack of safety in the environment following victimization (Mikkelsen & Einarsen, 2002). Those who bully may similarly be hypervigilant to the same emotion cues because they too feel a lack of safety in their environment (Colder, Mott, Levy, & Flay, 2000). Youth who bully may fear retribution for the bullying that they have engaged in, or they may maintain cognitions that peer rejection is inevitable (Zimmer-Gembeck & Nesdale, 2013). Consequently, they may become hypervigilant to emotion cues, emotionally hyper-aroused, and use bullying to protect themselves from anticipated rejection (Zimmer-Gembeck & Nesdale, 2013). This tenet is consistent with the mediating role of rejection cognitions in the relationship between electronic bullying and emotion responding.

**Rejection Cognitions**

In the current study, rejection cognitions were the mechanism through which electronic bullying and victimization were related to state and trait emotion. Given the consistency of the mediating role of rejection
cognitions, these findings may provide support for the application of the Anxious Apprehension Model of Trauma to bullying and victimization. The application of the Anxious Apprehension Model of Trauma to electronic bullying should be interpreted with caution, however, because there was overlap in experiences of electronic bullying and victimization that was not accounted for in the analyses. Given this overlap, we were unable to model relationships of the Anxious Apprehension Model unique to bullying experiences in the absence of victimization. Consequently, there are two potential explanations for the mediating role of rejection cognitions in both electronic bullying and victimization. First, both the perpetrator and victimized individuals may experience rejection cognitions, which maintain each of their respective roles in interpersonal reactions. Alternatively, previous victimization experiences of those who bully may provide the traumatic experience that results in rejection cognitions. Regardless, the mediating role of rejection cognition in the associations among electronic bullying, victimization, and emotion provide support for the tenet that electronic bullying and victimization experiences are associated with rejection cognitions, which in turn, may result in emotional arousal. One possible interpretation of the mediating role of rejection cognitions is that youth who have been electronically victimized may become emotionally hyper-aroused online as a result of this traumatic experience because they perceive rejection, and thus potential threats, in their online peer interactions more readily. Those with electronic victimization experiences would have a memory of this trauma that may be activated during social stress, increasing the likelihood peer rejection cognitions, which then provide support for the activation of the stress response system, resulting in state emotion reactions during social stressors such as social exclusion (Blackhart, Eckel, Tice, 2007; Downey, Khouri, Feidman, 1997; Eisenberger & Lieberman, 2004). In addition, these results have demonstrated that state rejection cognitions mediate the relationship between electronic victimization and trait emotionality as well. This may mean that the rejection cognitions activated by trauma experience (peer victimization) may result in emotion hyper-arousal in many different contexts, such as social interactions with family, interactions with one’s community, and during academic challenges, Future studies would benefit from examining how youth who are victimized and youth who bully generalize the rejection and emotion regulation difficulties to other relationships, such as with family, teachers, and community members.
Moral Disengagement

Previous literature has indicated that moral disengagement attitudes are related to electronic bullying (Almeida, Correia, & Marinho, 2009; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, Berrone, & Zanetti, 2012). In the current study, rejection cognitions mediated the relationship between electronic bullying and moral disengagement. This finding supports the Anxious Apprehension Model tenet that cognitions about others (rejection cognitions) can generalize to cognitions about the world (moral disengagement). Rejection cognitions may play a mediating role in moral disengagement similar to the mediating role it was hypothesized to play in emotional arousal above. Youth who bully may have a shared experience of rejection with the person they have victimized and this experience of rejection increases their sense of their sensitivity to cues of peer rejection (Correia, Kamble, & Dalbert, 2009; Zimmer-Gembeck & Nesdale, 2013). This threat of rejection may then foster cognitions that bullying and other amoral acts are not only acceptable, but also necessary to protect themselves from peer rejection. Thus, rejection cognitions may simultaneously support the need for bullying behavior to protect one’s self, as well as moral disengagement attitudes that justify bullying actions. Furthermore, bullying others, and the perception of rejection that comes along with bullying, only serves to provide evidence that these moral disengagement attitudes are true and useful, maintaining the moral disengagement attitudes. Further studies that examine cognitions about the self, others, and the world longitudinally would be helpful in confirming the precise pathways through which maladaptive cognitions generalize to other contexts and maintain one another.

Anxious Apprehension Model of Trauma and its Clinical Implications

The current study may provide preliminary support for the application of the Anxious Apprehension Model of Trauma to intervention and prevention efforts for electronic victimization and bullying. First, the state physiological changes found in those who are electronically victimized and who electronically bully suggests that using strategies such as mindfulness, deep breathing, and biofeedback may be helpful to break the maintenance cycle of electronic bullying and victimization. These findings also suggest that awareness of physiological responses to social contact online may be a useful component of the curriculum in prevention programming for electronic bullying. Second, rejection cognitions may be an important target for intervention and prevention in those involved in bullying incidents. For example, awareness of rejection
cognitions, developing balanced cognitions about peers, and theory of mind practice might be helpful in shifting rejection cognitions to a more broad view of the potential interpretations of peers’ behaviors. The mediating role of rejection cognitions also suggests that providing skills for balanced interpretations of peers’ intent may aid in the prevention of bullying and decrease the potentially long-term consequences of emotion arousal in those who have electronically bullied others or been victimized. Rejection cognition mediation findings for electronic bullying perpetration highlight the importance of early intervention to reduce the likelihood of these cognitions generalizing to maladaptive cognitions regarding morals, rules, and other relationships.

**Limitations**

The current study has made a contribution to the electronic bullying literature; however, there are four main limitations. First, the design of this study was cross-sectional, and, therefore it is not possible to infer causation of effects within the indirect effects models presented. Longitudinal studies would enhance understanding of the directionality of effects. Clinical research that provides interventions on key trauma processes while measuring subsequent changes in electronic bullying behavior, would provide additional evidence to support the tenet that trauma physiological, emotional, and cognitive responses are consequences and maintaining factors in electronic bullying and victimization. Second, the current study sample had a small percentage of youth who reported bullying others electronically, and consequently, results should be interpreted cautiously. The results may not be generalizable to all individuals with these experiences. Future studies should recruit youth from counseling and clinical samples to find variation in degree and chronicity of electronic victimization and bullying experiences. Third, the current study assessed only one physiological marker, which is problematic. A combination of physiological markers would present a more reliable and accurate assessment of the physiological stress response. In addition, the current study relied on self-report measures of state self-conscious emotion reactions and trait emotionality, which limits the reliability of the findings. Self-reports create a potential for response bias. Future studies using facial coding and third-party raters to observe emotion responses would add to the reliability and generalizability of the current findings. Furthermore, parent and teacher reports of trait emotion regulation, attitudes, perceptual biases, and electronic bullying and victimization involvement would improve reliability and generalizability of the current findings. Finally, the high correlation between electronic bullying and victimization precluded
an examination of victimization and bullying concurrently in one comprehensive model. Behaviorally rooted bullying and victimization measures provide more variance and increased reporting, compared to the use of a definition of bullying and frequency reports utilized in the current study (Green, Felix, Sharkey, Furlong, & Kras, 2013). Future studies may choose to use behavioral examples of electronic bullying as items rather than using a conceptual definition of electronic bullying and accompanying frequency reports. In addition, it would be helpful to examine a clinical sample of individuals with chronic victimization and bullying experience, rather than exploration in a normative sample. This type of sample would provide a larger sample of individuals with bullying and victimization experience that would allow for more variability in the measures as well as the potential to explore electronic bullying and victimization in one comprehensive model. The generalizability of these findings is limited given that the sample was limited to primarily normative Caucasian adolescents from a small geographical area. Future replication of these findings in clinical samples and normative samples is required.

Conclusions

The findings from the current study support the application of the Apprehension Model of Trauma, to the study of electronic bullying and victimization by examining the physiological and emotion states and processes associated with electronic bullying and victimization. State changes in physiological arousal, state changes in self-conscious emotion, and trait emotionality were associated with a history of electronically victimization and electronic bullying. In addition, we identified state rejection cognitions as a mediator for the link between electronic bullying/victimization and emotional arousal. Lastly, the study identified rejection cognitions as a mediator of the relationship between electronic bullying and moral disengagement attitudes. Together these findings are consistent with a conceptualization of electronic bullying and victimization as a trauma experiences associated with physiological and emotional hyper-arousal. In addition, the findings support the mediating role of state cognition in how electronic bullying and victimization are associated with emotion arousal and trait cognitions. An understanding of the state responses and proximal processes, along with future casual evidence of these pathways, may inform the development of intervention and prevention that aims to develop more healthy relationships for those involved in electronic bullying and victimization.
References


and acceptance by peers. *Biological psychology, 75*(3), 267-276. doi: 10.1016/j.biopsycho.2007.03.005


doi: 10.3389/fpsyg.2014.00956


Silvetti, M. S., Drago, F., & Ragonese, P. (2001). Heart rate variability in healthy children and adolescents is


Chapter 4

Electronic Proactive and Reactive Prosocial Behavior

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Abstract

Few studies have examined electronic prosocial behaviors, such as electronic proactive (kindness) and reactive (defending) prosocial behavior. The aim of this study was to understand electronic prosocial behavior by achieving three main goals. First, we developed a new measure of electronic proactive prosocial behavior. Second, we examined the personal inputs (maladaptive behaviors, moral disengagement attitudes, time online, and electronic proficiency) and proximal processes (emotionality, electronic self-conscious appraisals, and self-regulation) associated with electronic proactive and reactive prosocial behavior. Third, we examined gender as a moderator of the relationships between proximal processes and electronic proactive and reactive prosocial behavior. An online survey was administered with 78 male and 98 female participants from grade 5 to 11. Structural equation modeling was used to implement measurement and path models. Multiple linear regression analyses were used to examine the proximal processes that predicted electronic proactive and reactive prosocial behavior in a subsample of grade 8-11 youth. Results confirmed the structure of a new electronic proactive prosocial behavior and identified that it was divergent from, but related to proactive offline prosocial behavior. Moral disengagement was negatively associated with electronic reactive prosocial behavior. Electronic bullying, time online, and attentional control skills were positively associated with electronic proactive prosocial behavior. There also were gender differences in how proximal processes were associated with electronic prosocial behavior. In males, self-conscious appraisals were positively associated with proactive prosocial behavior and in females motivational control was positively associated with reactive prosocial behavior. The differences between electronic reactive and proactive prosocial findings were discussed in terms of the differences in social risk, function, and antecedents associated with electronic proactive and reactive prosocial behavior.
Introduction

Researchers studying electronic social behaviors have focused primarily on the prevalence of negative electronic behaviors (e.g., bullying) and the detrimental social-emotional consequences of frequent Internet use (Engelberg & Sjoberg, 2004; McPherson, Smith-Lovin, & Brashears, 2006; Mitchell, Wolak, Finkelhor, 2007; Reis & Shaver, 1988). In contrast, very little attention has been given to positive electronic behaviors. This gap in the literature is surprising, given the frequency of youth online socialization and the prevalence of positive electronic social experiences (Butler, Sproull, Kiesler, & Kraut, 2007; Wang & Wang, 2008). One potential explanation for the paucity of research in this area is the absence of a framework to examine electronic prosocial and antisocial behavior. Recently, Kowalski, Giumetti, Schroeder, & Lattanner (2014) proposed the General Aggression Model as a comprehensive theoretical framework for studying the personal inputs (e.g., past experiences and attitudes) and proximal processes (e.g., social appraisals and decision making) associated with electronic bullying. Although the model was initially developed to explain aggressive behavior, it can be applied to the study of electronic prosocial behavior because it incorporates the unique aspects of the electronic context. The personal inputs and proximal processes identified in the General Aggression Model have been examined in isolation as they relate to offline prosocial behavior; however, there has been no equivalent literature in the electronic environment (Bandura, 2002b; Bellanti & Bierman, 2000; Crick & Dodge, 1994; Eccles & Wigfield, 2002; Eisenberg, 2000; Erlich, Erlich-Phillip, & Gal-Ezer, 2005; Kochanska, Murray, & Coy, 1997; Menesini & Camodeca, 2008; Olthof, 2012; Sage, Kavussabu & Duda, 2006; White, McConnell, Clipp, Bynum, & Teague, 1999). To fill these gaps, the first goal of this study was to develop a measure of online prosocial behavior. The second goal was to examine the personal inputs and proximal processes of the General Aggression Model and their association with electronic prosocial behaviors. The third goal of the study was to examine the gender differences in how proximal process components were associated with electronic prosocial behavior.

There are two types of prosocial behaviors: reactive and proactive. Reactive prosocial behavior includes helping behaviors such as defending someone who has been bullied (Boxer, Tisak, & Goldstein, 2004). Reactive prosocial behavior involves a precipitating moral transgression whereby the defender recognizes peer distress after a moral transgression and looks to assist in mitigating that distress and remedying the moral transgression (Caravita, DiBlasio, & Salmivalli, 2009; Gini, Albiero, Benelli, & Altoe,
Proactive prosocial behavior, or kindness, is defined as sharing and caring behaviors, such as efforts to comfort another or make another smile or laugh (Eisenberg, Fabes, & Spinrad, 2007). Through proactive prosocial behavior, an individual meets the physical or emotional needs of another, but there is no immediate moral transgression that the individual is called to remedy. There are previously validated measures of electronic reactive prosocial behavior; however, to date there has been no measure to describe electronic proactive prosocial behavior. As a result, the current study explored the structure and reliability of a new electronic proactive prosocial behavior measure. In addition, given substantial conceptual differences between electronic proactive and reactive prosocial behavior, the current study also examined whether the personal inputs and proximal processes specified in the General Aggression Model below were differentially associated with these two behaviors (see Figure 1).

There are substantial gender differences in the frequency of, and skills associated with, proactive and reactive prosocial behaviors. For example, females more frequently engage in offline prosocial behavior that involves caring for a peer, such as proactive prosocial behavior, while males are more frequently involved in justice-oriented offline prosocial behaviors, such as reactive prosocial behavior (Jaffee & Hyde, 2000). This difference may extend to the electronic context because there are significant differences in how male and female youth use the electronic medium (Herring, 1999; Odell, Korgen, Schumacher, & Delucchi, 2000;
Male youth engage in more gaming activities online, whereas females are more likely to engage in social networking (Steeves, 2014). Consequently, males may have more opportunities to engage in reactive prosocial behavior in online gaming contexts where conflict is more common and the norms regarding rule following and fairness are more prominent. In contrast, females may have more opportunities to engage in electronic proactive prosocial behavior when engaging in relationship building activities such as social networking. There also are documented gender differences in the skills we hypothesized to be associated with electronic prosocial behavior. For example, males and females differ on proximal processes such as appraisal and self-regulation (Ferguson, Eyer, & Ashbaker, 2000; Hargittai & Shafer, 2006; Menesini & Camodeca, 2008; Patrick, Ryan, & Pintrich, 1999). Thus, we predicted that the relationship between proximal processes and electronic prosocial behavior would be different for males and females. The details of these gender differences are explored in subsequent sections.

**Personal Inputs**

Maladaptive peer experiences, electronic proficiency, time online, and moral disengagement attitudes were chosen as personal inputs to explore in the current study because there is previous literature to indicate that each of these inputs are relevant to understanding electronic antisocial behavior (Almeida, Correia, & Marinho, 2009; Hinduja & Patchin, 2008; Sticca, Ruggieri, Alsaker, & Perren, 2013; Ybarra & Mitchell, 2004). Furthermore, each of these inputs is behaviors unique to the electronic environment or is uniquely impacted by the electronic environment. For example, electronic bullying and victimization (maladaptive peer experiences), electronic proficiency, and time online are personal inputs that provide direct assessments of youths’ experiences with, and relationship to, technology. Youths’ online experiences and relationship with technology can provide preliminary understanding of how personal inputs specific to the electronic context are associated with electronic prosocial behavior. In addition, the depersonalization that occurs when communicating with people online increases the propensity towards moral disengagement attitudes and moral disengagement attitudes are associated with electronic antisocial behaviors (Almeida, Correia, & Marinho, 2009; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, Berrone, & Zanetti, 2012). Consequently, it is important to have an understanding of how moral disengagement attitudes may be related to electronic prosocial behavior as well. Below we provide specific predictions regarding
how maladaptive peer experiences, electronic proficiency, time online, and moral disengagement attitudes are associated with electronic proactive and reactive prosocial behavior.

Maladaptive peer experiences include relationship problems, such as electronic bullying and victimization. Offline aggression and victimization are negatively associated with offline prosocial behavior (Ladd & Profillet, 1996). These associations however, may differ within the electronic context. For example, electronic defending behaviors are positively associated with the electronic bullying role (McCuaig Edge, Craig, & Legate, 2012). This finding may reflect the uninhibited nature of online behavior, whereby electronic bullying may be an impulsive reaction to one’s own emotion cues and electronic reactive prosocial behavior may be an impulsive reaction to the emotion cues of others and oneself (Suler, 2004; Suniti Bhat, 2008). Consequently, we predicted that electronic bullying and electronic reactive prosocial behavior would be positively associated with one another. In contrast, proactive prosocial behavior is a less impulsive action that has been associated with positive interpersonal problem-solving skills, whereas involvement in bullying and victimization has been associated with greater impulsivity and poor interpersonal problem-solving skills (Bellanti & Bierman, 2000; Eisenberg, 2000; Normandeau & Guay, 1998; Warden & McKinnon, 2003). In the electronic context, social problem solving may be increasingly complex due to hidden or anonymous social partners and the absence of cues to elicit empathy and perspective –taking. As a result, youth who have maladaptive online peer experiences (electronic bullying and victimization) may not have the social problem solving skills required for the complexities of electronic prosocial behavior. Subsequently, we hypothesize that electronic bullying and victimization would be negatively associated with electronic proactive prosocial behavior, similar to offline prosocial findings.

Offline proactive prosocial behavior has been positively associated with social knowledge, social proficiency, and time spent with peers (Eisenberg, Steinfield, & Lampe, 2007; Howes, 1988). In the electronic context, other cognitive competencies, such as electronic proficiency and time spent in the electronic medium, may be required for positive electronic social skill development. For example, technological proficiency plays a role in whether an individual can maneuver complex social dynamics online (Erlich, et al., 2005; White et al., 1999). Furthermore, time spent on social networking sites has been associated with positive social outcomes such as increased number of friendships and social capital (Ellison, Steinfield, & Lampe, 2007). Electronic proficiency and time online are likely particularly important for
electronic proactive prosocial behavior. Proactive prosocial behaviors may require significant technical skill in both identifying electronic opportunities to enact proactive prosocial behaviors, as well as, finding creative ways to use electronic media to communicate the message of kindness to peers. In addition, when youth spend more time online they may have more opportunities to observe and engage in electronic proactive prosocial behavior. We hypothesized that perceived electronic proficiency and time online would be positively associated with electronic proactive prosocial behavior.

Moral disengagement attitudes are defined as a person’s willingness to cognitively excuse immoral behavior (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Amoral attitudes such as moral disengagement are negatively associated with offline proactive and reactive prosocial behavior (Bandura et al., 1996; Obermann, 2011). Bandura et al. (1996) suggest that inaction in the face of human distress (e.g., refraining from defending) requires amoral attitudes such as moral disengagement. Conversely, individuals who hold low moral disengagement attitudes are more likely to humanize someone who is victimized and perceive a sense of responsibility to act (Bandura, Underwood, & Fromson, 1975). Within the electronic context, moral disengagement attitudes have been positively associated with electronic bullying (Almeida, et al., 2009; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, et al., 2012). Although there is no evidence to support an opposite relationship between moral disengagement and electronic prosocial behavior, there is an increased potential for dehumanization and diffusion of responsibility created in online contexts (Pornari & Wood, 2010). The electronic context fosters depersonalization and dehumanization because youth are interacting with peers remotely and the presence of large online social networks increases perceptions that there are many potential helpers, which increases diffusion of responsibility (Kiesler, Siegel, & McGuire, 1984; Markley, 2000; Pornari & Wood, 2010). Dehumanization and diffusion of responsibility are moral attitudes similar to moral disengagement that may support inaction in the face of peer distress or need. Conversely, strong moral convictions against moral disengagement may be essential in fostering prosocial behaviors in the electronic environment where the there is increased risk for amoral attitudes. We hypothesized that there would be a negative association between moral disengagement and both types of electronic prosocial behavior.
**Proximal Processes**

There are two main components of the General Aggression Model’s proximal processing: appraisals and decision-making. In the current study self-conscious appraisals and emotionality were chosen to represent the appraisal component of the General Aggression Model. Attentional control and motivational control were chosen to represent the decision-making component of the General Aggression Model. These specific proximal processes were chosen because they are impacted by the unique characteristics of the electronic environment. Electronic characteristics such as large online audiences create a greater risk for self-conscious appraisals. In addition, electronic communication can result in higher emotionality (Derks, Fischer, & Bos, 2008; Martin, Coyier, VanSistine, & Scroeder, 2013). Finally, the fast-paced nature of technology can increase risk for impulsivity and inattention rather than maintaining motivation towards a goal (Fox, Rosen, & Crawford, 2009).

The primary appraisal component of proximal processing involves interpretations of threat in social situations (Anderson & Bushman, 2002). Self-conscious appraisals are cognitive appraisals of shame, embarrassment, and self-blame (Tangney & Dearing, 2003). Internal self-sanctions such as, self-conscious appraisals, drive proactive prosocial behavior because they result in feelings of inadequacy and threaten an individual’s sense of identity (Bandura et al., 1996). Engagement in prosocial behavior is a way to restore an individual’s sense of adequacy and their sense of identity as a “good friend” or “nice person.” Consistent with this tenet, youth who engage in proactive prosocial behavior offline report greater shame as compared to youth who bully (Menesini & Camodeca, 2008). In the electronic environment, large audiences can view shameful or embarrassing events and the size of an audience increases experiences of shame and embarrassment (Smith, Webster, Parrott, & Eyre, 2002). Consequently, self-conscious appraisals may be particularly pertinent to electronic proactive prosocial behavior. Thus we predicted that electronic self-conscious appraisal would be positively associated with electronic proactive prosocial behavior. In addition, previous studies have demonstrated gender differences in the prevalence of self-conscious appraisals (Ferguson, et al., 2000; Menesini & Camodeca, 2008). Females rate their self-conscious reactions to hypothetical and experiential scenarios as more intense than males (Ferguson, Olthof, & Stegg, 1997; Perry, Perry, & Weiss, 1989). In the electronic context, the role of self-conscious appraisals in females may be exacerbated because females share more personal information online, leaving themselves more vulnerable to...
self-conscious appraisals than males (Stern, 2004). We predicted that electronic self-conscious appraisals would be more strongly and positively associated with electronic proactive prosocial behavior in females than males.

Emotionality is a second type of primary appraisal. Emotionality has been examined extensively with respect to offline prosocial behavior (Denham, 1986; Eisenberg, 2000). In the offline context, research has found that emotionality is negatively associated with proactive prosocial behavior (Eisenberg et al., 1996). Due to heightened emotionality online, the ability to maintain low emotionality may be essential in fostering electronic proactive prosocial behavior (Derks, Fischer, & Bos, 2008; Martin, Coyier, VanSistine, & Scroeder, 2013). Accordingly, we hypothesize that emotionality would be negatively associated with electronic proactive prosocial behavior. In contrast, the relationship between emotionality and electronic reactive prosocial behavior may be opposite, whereby emotionality is positively associated with reactive prosocial behavior. In offline context, youth with high emotionality defend bullying “victims” more than individuals with low emotionality (Barhight, Hubbard, & Hyde, 2013). Both behavior and emotions are more uninhibited in electronic environments and there are theories to suggest that the greater emotionality online actually drives uninhibited electronic behaviors (Kiesler, Zubrow, Moses, & Geller, 1985; Suler, 2004). The online context may foster impulsive reactive prosocial behavior through the exacerbation of online emotionality. Thus, we predicted that emotionality would be positively associated with electronic reactive prosocial behavior. In addition, there may be gender differences in emotionality because males make use of electronic emotion expression only with female partners, whereas females use of emotion expression frequently online with both male and female social partners (Wolf, 2000). Females’ more broad use of emotion expression in online communication may indicate a greater identification with emotion online, which could increase the likelihood for emotionality when witnessing an online bullying interaction, further increasing the likelihood of responding by defending. Therefore, we predicted that emotionality would be more strongly positively associated with electronic defending behavior in females, when compared to males.

The decision-making component of proximal processing involves the ability to engage in impulsive versus thoughtful action when making social decisions. Although, we were not able to measure social decision making directly, we represented decision-making by examining two components of self-regulation:
attentional control and motivational control. These two skills are known to foster thoughtful rather than impulsive social action (Waldman, 1996). In addition, attentional and motivational control have been positively associated with both offline proactive and reactive prosocial behavior (Bellanti & Bierman, 2000; Eccles & Wigfield, 2002; Kochanska, et al., 1997; Sage et al., 2006). In the online context, these self-regulation skills are important because there are frequent distractions and the rapid pace of communication increases the risk for impulsivity (Fox, et al., 2009). We hypothesized that attentional and motivational control would be positively associated with electronic reactive and proactive prosocial behavior.

Furthermore, there are gender differences in self-regulation, with attentional and motivational control being consistently greater in females than in males (Hargittai & Shafer, 2006; Patrick et al., 1999). In addition, in offline context, there are gender differences in the frequency of prosocial behaviors in youth with attention difficulties (Novik et al., 2006). For example, females with attention difficulties are rated as more prosocial than males (Novik et al., 2006). We predicted that attentional control skills would be more strongly positively associated with electronic proactive and reactive prosocial behavior in males than females.

To provide a theoretically driven basis for the study of electronic prosocial behavior, the current study had four main objectives. First, we aimed to develop a measure of electronic proactive prosocial behavior and explore its divergence from offline proactive prosocial behavior. Second, we examined the personal inputs and proximal processes associated with electronic proactive and reactive prosocial behavior. To this end, we examined the association of maladaptive behaviors, moral disengagement attitudes, electronic proficiency, time online, electronic self-conscious appraisals, emotionality, attentional control, and motivational control with both proactive and reactive electronic prosocial behavior. Third, we explored the differences between personal inputs and proximal processes associated with electronic proactive and reactive prosocial behavior. Finally, gender differences in the relationships among proximal processes and electronic prosocial behaviors were examined.

**Methods**

**Participants**

One hundred and seventy six youth from grades 5-11 were recruited using social networking, including posting the survey link on Promoting Relationships and Eliminating Violence Network’s (PREVNet) Facebook page and the website Bullying.org. Seventy-eight male participants and 98 females
participants were recruited. This sample of 176 was reduced to a sample of 140 youth due to incomplete data (Sample 1). Attrition analyses revealed that those remaining in the analyses did not significantly differ from those removed on any of the variables used in the analyses ($ps > .01$). There were fewer older participants than younger participants in the sample, with 12, 37, 33, 29, 11, 8, 10 youth reporting being in grades 5, 6, 7, 8, 9, 10, and 11, respectively. A subsample of the 59 students in grade 7-11 students completed an extended battery of questions that included emotionality and self-regulation variables (Subsample 1). The three participants deleted from the analysis due to incomplete questionnaires did not significantly differ from those youth remaining in the analysis ($ps > .01$). The subsample was composed of 3, 28, 11, 7, and 10 grade 7, 8, 9, 10, and 11 students, respectively.

A second sample of 199 youth was recruited from three schools within Ontario (Sample 2). This sample was a separate, but demographically similar sample used to confirm factor structure obtained from the sample above. One hundred and ninety-nine students from grade 9-12 participated in the survey during class time with parental and adolescent consent. Each gender was well represented with 99 male participants and 100 female participants. Students were divided amongst grades 9, 10, 11, and 12, with 60, 47, 39, and 48 youth reporting being in each grade respectively. One hundred and seventy youth remained in the data set when youth with incomplete data were removed. Attrition analyses revealed that those remaining in the analyses did not significantly differ from those removed on any of the variables used in the analyses ($ps < .01$). The second, school-based sample differed from the above sample in that the participants were slightly older, and reported engaging in sending nice forwarded messages to others and bringing groups together more often, $t (275) = 3.39, p = .001$.

**Measures**

The measures presented below were self-report questionnaires. The structure of each measure was confirmed using Structural Equation Modeling (SEM) and final parameter estimates for the items in each measure are presented in the results section. Items that produced standardized parameter estimates less than .50 were removed from the SEM model (Tabachnick & Fidell 2007). Psychometric analyses for each of the continuous self-report measures used in the regression analyses were completed using principal components analysis. Cronbach’s alpha was used as the measure of reliability (see Table 1).
Demographics (Grade, Gender, Time Online, and Electronic Proficiency). Youth were asked how much time they spent online during the regular weekday and during the regular weekend (2 questions). Responses ranged from “less than one hour” to “eight or more hours” (9 response options). Youth were also asked to report their perception of their proficiency with computers and the Internet (2 questions). Responses ranged from “I am much better than most students my age” to “I have much more difficulty than students my age” (5-point scale), with higher scores representing greater proficiency.

Electronic Proactive Prosocial Behavior (Appendix F). The Electronic Proactive Prosocial Behavior (EPPB) questionnaire was developed for the purpose examining prosocial behavior in the online environment specifically. Youth were asked whether they engaged in online prosocial behaviors with others that are electronic equivalents of the offline Prosocial Behavior Questionnaire (Paquette & Underwood, 1999). For example, youth were asked “How often do you find ways online to include people you don’t normally hang out with” and responded on a 4-point scale from “never” to “often”. High scores on this measure reflect high frequency of electronic prosocial behavior. Psychometric properties of this variable can be found the Results section of this paper.

Offline Prosocial Behavior. The Prosocial Behavior Questionnaire was used to measure offline prosocial behavior. The questionnaire consisted of a 5-item questionnaire assessing the kind and caring things youth do for their peers (Paquette & Underwood, 1999). Participants were asked to respond to questions such as “I cheer up another student when they are sad or upset” using a 4-point scale from “never” to “often.” High scores on this measure reflect high frequency of offline prosocial behavior. The alpha reliability was observed at $\alpha = 0.92$.

Electronic Bullying Roles: Victimization, Bullying, and Defending. This questionnaire was based on the Participant Roles Questionnaire (PRQ) and focus group meetings with youth (McCuaig Edge, Craig, & Legate, 2010; Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996). The Cyberbullying Participant Roles Questionnaire (CPRQ) contained 12 of the original 38 items that ask participants about how often they engage in a variety of online activities. The CPRQ asked participants to rate from 1 to 5 (ranging from “never” to “often”) how frequently they have electronic experiences such as “others saying mean things to you online,” (victimization), “starting website aimed at hurting others” (bullying), and “make supportive comments to defend the victimized person” (defending). This version of the CPRQ added 3
additional questions about being victimized online to provide a more reliable (4-item) estimate for the electronic victimization scale. The CPRQ was designed specifically for assessing participant roles in the context of text messaging, instant messaging, email, websites, and social networking pages such as Facebook. The three subscales of this measure included electronic bullying, electronic defending, and electronic victimization. High scores on each of these measures reflect increased frequency of the behaviors.

**Electronic Self-Conscious Appraisal** (Appendix B). Electronic self-conscious appraisals were measured using a six-item scale that was designed for the current study. The measure was initially designed to measure guilt and shame reactions of adolescents after reading vignettes designed to represent common ambiguous, potentially electronic bullying scenarios. This measure was based on Tangney and Dearing’s (2003) response anchors for guilt and shame vignettes, however the vignette used by Tangney and Dearing (2003) were not ambiguous and were developed to universally induce shame and guilt. The ambiguity of the scenarios in the current measure created difficulty for confirming a component structure. The anchors attempted to capture guilt in shame in the way Tangey and Dearing are able to; however, the vignette structure also made it difficult to design anchors that elicited guilt only and not sense of embarrassment, shame, and hiding as well. For example, youth read the scenarios where guilt and shame appraisals could be possible and were asked questions to assess the attributions of guilt and shame they would attach to these ambiguous scenarios (e.g., “You go visit your Facebook page to see what pictures people have posted. You notice a picture of you and comments underneath: a) I need to find out who posted the comments; and b) This is what people really think of me?”). Participants were asked to respond on a 5-point scale from “not at all likely” to “very likely.” The measurement model phase of the Structural Equation Model indicated that only 5 of the 12 items demonstrated acceptable factor loadings (structural weights < 0.50 for 7 items). When the 5 items were examined for face validity, the items that were included reflected a sense of shame, hiding or need to fix the situation to avoid further embarrassment, and self-blame (consistent with Study 1). As such, the measure was renamed Electronic Self-Conscious Appraisals, which more accurately reflects the combination of shame, embarrassment, and self-blame that excluded any reference to guilt, which was not measured in the five items that fit the component structure. Higher scores on the subscale represented greater self-conscious appraisals.
Moral Disengagement. Moral disengagement was initially meant to be measured using an electronic specific measure of moral justification; however the newly created measure demonstrated poor validity and reliability. Instead, moral disengagement was measured using a four-item Moral Justification subscale of the Moral Disengagement Scale (Bandura, et al., 1996). The Moral Justification subscale assessed the degree to which adolescents were willing to use intellectual arguments and cognitive restructuring to condone immoral actions by asking youth to rate statements such as “It’s ok to fight to protect your friends” from “I disagree” to “I completely agree” (4-point scale; Bandura, et al., 1996). Higher scores on this scale represent stronger tendency to morally disengage. The complete moral disengagement scale (moral justification, euphemistic language, advantageous comparison, displacement of responsibility, diffusion of responsibility, distorting consequences, attribution of blame, and dehumanization subscales) has a previously reported reliability of 0.82.

Electronic Emotionality. Participants’ trait emotionality while online was measured using two items based on the Emotion Reactivity Scale (Nock, Wedig, Homberg, & Hooley, 2008). The questions asked participants to rate the two statements “people say I over-react to what people say to me online” and “I feel very “on edge” when I am online” on a 5-point scale from “not at all true about me” to “extremely true about me.” Higher scores on this scale represent greater emotionality. Principal components analysis yielded a one-component solution accounted for 70% of the variance among the scores (component loadings > .77).

Self-Regulation: Attentional Control and Motivational Control. The Short-Term Self-Regulation Scale was used to measure self-regulation. The measure uses a 6-item scale that assessed youth’ abilities to regulate their behavior and stay focused on tasks (Self-Regulation; Moilanen, 2007). Participants were provided statements about self-regulation and were asked to rate whether the statement was consistent with their behavior on a 4-point scale from “not like me at all” to “completely like me.” In the current sample, a one component solution accounted for < 20% of the variance in scores and a scree plot indicated that a two-component solution better fit the data. The two components produced were attentional control and motivational control. The attentional control subscale included reverse-coded items such as “In a boring class I have trouble forcing myself to start paying attention.” The attentional control subscale was composed of three items and that component accounted for 35% of the variance in scores (component loadings > .65). The motivational control subscale reflected the ability to stay motivated towards goals and resisting impulses.
to do otherwise. For example, this subscale included reverse-coded questions such as “Little problems distract me from my long-term plans.” Motivational control was composed of three items and that component accounted for 33% of the variance in scores (component loadings > .62).

**Procedure**

Participants were recruited online through bullying advocacy websites. In addition, a second sample of participants was recruited from three Ontario schools. In both cases consent was obtained from parent/guardian and youth. In the electronic survey, each question had several response choices in addition to a response option that allowed the youth to skip the question. Youth who were in grade seven or younger received an abbreviated version of the survey to ensure that the length of the questionnaire was developmentally appropriate. The abbreviated questionnaire did not include the Attentional Control, Motivational Control, and Electronic Emotionality measures. After completing the survey, youth were provided with a debriefing letter. Data collection and the treatment of participants complied with APA Ethical Principles (see Appendix G for ethics approval).

**Results**

**Confirmatory Factor Analysis of Electronic Prosocial Behavior**

A confirmatory factor analysis was implemented on the eight items of the electronic proactive prosocial behavior scale with Sample 1. Data screening indicated normality of all eight items and linear relationships between each pair of items. In addition, no univariate or multivariate outliers were observed when boxplots and Mahalanobis distances were examined. Finally, examination of the covariance matrix and covariance residuals did not provide any evidence of singularity or multicollinearity.

The hypothesized electronic proactive prosocial behavior model is presented in Figure 2. The full model was hypothesized to contain all eight items loading on one factor, electronic prosocial behavior. This 8-item model resulted in appropriate fit ($\chi^2 (20) = 23.90, p = .25; \text{RMSEA} = 0.04; \text{CFI} = .99; \text{SRMS} = .04$), while the independence model indicated an extremely poor fit ($\text{RMSEA} = 0.310$). Modification indices did not indicate that any changes to the model were necessary and all standardized regression weighted were above 0.5, thus the hypothesized model was retained.
Figure 2. Confirmatory Factor Analysis for Electronic Prosocial Behavior

A confirmatory factor analysis was implemented with Sample 2. The eight-item model of electronic proactive prosocial behavior in this second sample also produced acceptable fit indices ($\chi^2 (20) = 46.68, p = .02; RMSEA = 0.06; CFI = .97; SRMR = .04$). This model also displayed a much more acceptable fit than the independence model ($RMSEA = 0.251$). No significant modification indices were provided and seven of the eight items had standard regression weights above $r = 0.50$. One item, sharing virtual items, had a
standardized regression weight of 0.344 in the second sample. The electronic proactive prosocial behavior structure confirmed in Sample 1 (Figure 2) was compared across these two samples. Constraining measurement weights and structural covariance did not statistically significantly decrease the quality of fit (unconstrained vs. measurement weights constrained $\chi^2 (7) = 7.303, p = .390$; unconstrained versus structural covariance constrained $\chi^2 (8) = 7.343, p = 0.500$), thus factorial invariance across both Sample 1 and Sample 2 could be assumed. When the measurement residuals were constrained to be equal for both samples there was significantly worse fit ($\chi^2 (16) = 84.359, p < .001$). The difference in residuals between the two samples is likely a result of the discrepancy in age between the two samples in that younger youth likely produce more error in self-report questionnaires (Sample 1 was younger than Sample 2). Given the acceptable fit of the eight-item model in both samples and null findings from sample one and two model comparison statistics, the original model was retained.

To test whether offline proactive prosocial behavior was a construct divergent from the new electronic proactive prosocial behavior construct, a measurement model was with Sample 1, allowing all of the variables from the two measures to load onto one “general proactive prosocial behavior” construct and was compared to the second hypothesized model with two divergent factors (offline and electronic proactive prosocial behavior). The fit of these two models was compared and the divergent, two-factor model demonstrated preferable model fit when compared to the one factor model ($\chi^2_{diff} (1) = 272, p < .001$; Two factor model fit: $\chi^2 (64) = 105.10, p = .001; RMSEA = 0.07; CFI = .95; SRMR = .06$. One-factor model fit: $\chi^2 (65) = 377.17, p < .001; RMSEA = 0.19; CFI = .61; SRMR = .14$). In the two-factor model of proactive prosocial behavior the offline and electronic measure of proactive prosocial behavior were related to one another ($r = .447$), albeit a lower standardized value than either measures’ own respective standardized parameter values (all $> .50$). Thus, offline and electronic proactive prosocial behavior were related but unique constructs.

Given significant gender differences found in previous offline prosocial behavior research, we explored whether factorial invariance across gender could be assumed for the *Electronic Proactive Prosocial Behavior* measure. Each of the three gender constrained models did not provide a significantly poorer fit than the unconstrained model, thus factorial invariance of the electronic prosocial behavior measure can be assumed across males and females (unconstrained vs. measurement weights constrained $\chi^2 (7) = 2.70, p =$
.91; unconstrained vs. structural covariances constrained \( \chi^2 (8) = 2.84, p = .94 \); unconstrained vs. measurement residuals constrained \( \chi^2 (16) = 16.99, p = .39 \). Furthermore the fully constrained model provided acceptable fit statistics \( \chi^2 (16) = 71.17, p = .08; \text{RMSEA} = 0.04; \text{CFI} = 0.95; \text{SRMR} = .07 \).

**Predictors of Electronic Prosocial Behavior and Defending**

To explore the personal input and proximal processing predictors of electronic prosocial behavior, two separate sets of analyses were undertaken with Sample 1 and Subsample 1 (older participants from grade 8-11). The first set of analyses explored the maladaptive behaviors (electronic victimization and electronic bullying), moral justification, electronic proficiency, time online, and electronic self-conscious appraisals as predictors of electronic proactive and reactive prosocial behavior in Sample 1 (youth from grade 5 to 11) using structural equation modeling (Statistical Package for Social Sciences-AMOS). The second set of analyses examined electronic self-conscious appraisal, emotionality, and two measures of self-regulation (attentional and motivational control) as predictors of electronic proactive and reactive prosocial behavior in Subsample 1, while also examining gender as a moderator of these relationships. Due to the smaller size of Subsample 1 (59 participants) two separate multiple linear regression were implemented. Descriptive statistics and correlations among independent variables used to predict electronic proactive and reactive prosocial behavior in both sets of analyses are listed in Table 1. Table 1 indicates that in addition to hypothesized relationships between electronic prosocial behavior, personal inputs, and proximal processes, there are also several significant correlations between inputs and proximal processes that could be added to the hypothesized structural equation model. For example, correlations between time online and electronic proficiency, electronic bullying, and moral justification, and electronic bullying and victimization were significant and predicted from previous research, thus they were added to the model (Hinduja & Patchin, 2008; Pornari & Wood, 2010; Raskauskas & Stoltz, 2007; Ybarra & Mitchell, 2004). Additional correlations between self-conscious appraisals, emotionality, and motivational control were significant, but cannot be accounted for in the regression analysis due to the statistical constraints of the analysis. In addition, there was a significant correlation between attentional and motivational control. Gender differences between males and females on all variables used in the following analyses were examined as well. Females reported more electronic proactive and reactive prosocial behaviors, electronic proficiency, and self-conscious...
appraisals than males, \( t(138) = -4.55, p < .01; t(138) = -3.53, p < .01; t(138) = -2.90, p < .01; t(138) = -3.43, p < .01. \)
Table 1

Correlations Among All Study Variables

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Online</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elec. Proficiency</td>
<td>0.29**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elec. Bullying</td>
<td>0.23**</td>
<td>0.02</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elec. Vict.</td>
<td>0.15</td>
<td>0.04</td>
<td>0.72***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elec. Proactive Prosocial</td>
<td>0.30***</td>
<td>0.05</td>
<td>0.34**</td>
<td>0.36***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elec. Reactive Prosocial</td>
<td>0.21*</td>
<td>0.01</td>
<td>0.34**</td>
<td>0.35***</td>
<td>0.63***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-Conscious Appraisal</td>
<td>-0.01</td>
<td>0.07</td>
<td>0.15</td>
<td>0.30***</td>
<td>0.27**</td>
<td>0.29***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moral Justif.</td>
<td>0.13</td>
<td>-0.16</td>
<td>0.30***</td>
<td>0.09</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emotionality</td>
<td>0.14</td>
<td>0.15</td>
<td>0.21</td>
<td>0.43**</td>
<td>0.31*</td>
<td>0.17</td>
<td>0.32*</td>
<td>0.08</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Attentional Control</td>
<td>-0.17</td>
<td>-0.05</td>
<td>-0.133</td>
<td>0.07</td>
<td>0.36**</td>
<td>0.21</td>
<td>0.24</td>
<td>0.24</td>
<td>0.10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Motivational Control</td>
<td>0.13</td>
<td>0.10</td>
<td>-0.03</td>
<td>0.17</td>
<td>0.27*</td>
<td>0.06</td>
<td>0.23*</td>
<td>0.25</td>
<td>0.32*</td>
<td>0.51***</td>
<td>-</td>
</tr>
<tr>
<td>Total Sample Mean</td>
<td>4.20</td>
<td>2.53</td>
<td>1.22</td>
<td>1.36</td>
<td>2.39</td>
<td>2.00</td>
<td>2.72</td>
<td>2.21</td>
<td>2.28</td>
<td>2.60</td>
<td>2.16</td>
</tr>
<tr>
<td>(SE)</td>
<td>(2.20)</td>
<td>(0.89)</td>
<td>(0.48)</td>
<td>(0.67)</td>
<td>(0.79)</td>
<td>(0.93)</td>
<td>(0.31)</td>
<td>(0.93)</td>
<td>(0.89)</td>
<td>(0.84)</td>
<td>(0.82)</td>
</tr>
<tr>
<td>Reliability (α)</td>
<td>.98</td>
<td>.89</td>
<td>.89</td>
<td>.92</td>
<td>.89</td>
<td>.78</td>
<td>.98</td>
<td>.83</td>
<td>.87</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* < .05
** < .01
*** < .001

Note: Descriptive statistics and correlations for emotionality, attention, and motivational control are based on a subsample of 61 grades 8-12 youth. The remaining statistics are based on a sample of 140 grades 5-12 youth.

Personal Inputs and Proximal Processes Predicting Electronic Prosocial Behavior

A structural equation model was implemented using Statistical Package for the Social Sciences- AMOS. Data screening indicated normality of all variables, except electronic bullying and victimization. In addition, 15 outliers were observed in the variables that made up the electronic bullying and victimization measures. To reduce the influence of these outliers the scores were truncated to bring them closer to the maximum range of the remaining scores within the variable using Winsor procedure (Tukey, 1962). The transformation of scores improved skew and kurtosis values for the electronic bullying and victimization variables, however outlying scores remained. The presence of outliers in bullying and victimization is common given the statistical rarity of these experiences, thus these natural outliers were retained in the analyses. Mahalanobis distances indicated the presence of one multivariate outlier ($\chi^2(11) = 31.3, p < .001$) that was deleted for a total sample of 139 youth. Linearity among the variables in each analysis was also confirmed by examination of scatterplots. Finally, examination of the covariance matrix and residual covariances did not provide any evidence of singularity or multicolinearity.

Following data screening, a basic measurement model was implemented with all items loading on hypothesized latent construct and allowing for correlations between latent construct. Results from the measurement model suggested that there were low structural weights for items that loaded on the bullying, victimization, moral justification, and electronic self-conscious appraisal latent constructs (loadings < 0.6; see Measures above for details). Items with low factor loadings were removed from the model (Tabachnick & Fidell 2007). In addition, three correlations were added based on past literature and interpretation of the correlation matrix: time online with electronic proficiency, electronic victimization and bullying, as well as moral justification with electronic bullying. Modification indices from the measurement model also indicated that correlating errors of one bullying and one victimization item improved fit (MI = 15.32). Finally, gender was used as a control variable, with paths to electronic proactive and reactive prosocial behavior.

A preferred model and two alternative models were compared with respect to model fit using Bayesian Information Criterion (BIC$_{dif} > 10$). BIC was used to compare model fit because it gives preference for simplistic models and we aimed to find the most parsimonious model that could account for the relationships among these variables. The preferred model, used inputs and processes as predictors of electronic proactive and reactive prosocial
behavior based on past literature and theory, thus this model was termed “Theory Driven” model. In the “Theory Driven” model there were no paths from time online, electronic proficiency and electronic self-conscious appraisals to electronic reactive prosocial behavior for theoretical reasons presented above (see appropriate sections of introduction; Figure 3). The preferred model was then compared to an alternative model that allowed all paths between inputs and proximal processes with both electronic proactive and reactive prosocial behavior termed the “Comprehensive Model” (Alternative 1; Figure 4). A second alternative model was then planned to examine the directionality of these relationships, given that the study data was cross-sectional. This model was termed the “Opposite Directionality” model and it retained the best fitting model of the two presented above, testing whether paths in the opposite direction demonstrated preferable fit (Figure 5). The final model retained for interpretation of significant predictors was expected to demonstrate adequate fit on two out of three fit indices before significant predictors would be interpreted (Hoyle & Panter, 1995). Fit statistics used to judge adequate fit were Root Mean Square Error of Approximation (RMSEA < .07; Steiger, 2007), Comparative Fit Index (CFI > .9; Byrne, 1994), and Standardized Root Mean Square residual (SRMR < .08; Browne & Cudeck, 1993).
Figure 3. “Theory-Driven” Model: Selected Inputs and Processes Predicting Electronic Proactive and Reactive Prosocial Behavior
Figure 4. “Comprehensive” Model: All inputs and Processes Predicting Electronic Proactive and Reactive Prosocial behavior
Table 2 provides model fit statistics for the three models. Based on BIC, there was strong evidence to support that the Theory Driven model (preferred model) demonstrated superior fit than the “Comprehensive Model” (Alternative 1; all inputs and processes predicting both outcomes). Thus, the preferred model was retained and compared to the “Opposite Directionality” model. There was very weak evidence from BIC that the “Opposite Directionality” model was different from the “Theory Driven” model and the fit statistics were adequate for both models (Table 2). As a result, both the “Theory Driven” and Opposite Directionality” models had potential to be interpreted. Based on the theoretical relevance of the directionality of paths from inputs and proximal processes to electronic prosocial behaviors, the “Theory Driven” (preferred) model’s significant predictors were given preference. However, it is noteworthy that the “Opposite Directionality” model with reversed paths described all of the same relationships identified in the “Theory Driven” model with the exception of a positive association between electronic proactive prosocial behavior and moral justification in the “Opposite Directionality” model (see Appendix H). The “Theory Driven” model indicated a significant positive association of gender, time online, and electronic bullying with electronic proactive prosocial behavior (Figure 6). In addition, the “Theory Driven” model resulted in a negative path
from moral justification to electronic reactive prosocial behavior. All exogenous (measured variables) that composed latent constructs observed standardized parameter estimates at or above 0.60 in this model.

Table 2

Fit Indices for Structural Equation Models

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>$\chi^2$</th>
<th>RMSEA</th>
<th>CFI</th>
<th>SRMR</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Theory-Driven” (Preferred)</td>
<td>390</td>
<td>594.57</td>
<td>0.06</td>
<td>0.90</td>
<td>0.09</td>
<td>965.19*</td>
</tr>
<tr>
<td>“Comprehensive” (Alternative 1)</td>
<td>387</td>
<td>591.18</td>
<td>0.06</td>
<td>0.90</td>
<td>0.10</td>
<td>976.63</td>
</tr>
<tr>
<td>“Opposite Directionality” (Alternative 2)</td>
<td>386</td>
<td>580.61</td>
<td>0.06</td>
<td>0.91</td>
<td>0.10</td>
<td>967.69</td>
</tr>
</tbody>
</table>

*Significantly better fit than Alternative 1 model based on >10 difference in BIC.
Proximal Processes Predicting Electronic Prosocial Behavior (Older Subsample)

Multiple linear regression was used to examine the constructs above in addition to emotionality and self-regulation (attentional control and motivational control) as predictors of electronic proactive and reactive prosocial behavior. The possibility of gender moderating these relationships also was explored. Data screening procedures using boxplots and Mahalanobis distances did not reveal any univariate or multivariate outliers (Mahalanobis Distance: $\chi^2(12) = 32.9, p < .001$). All variables were normally distributed and linearly related to one another. No multicollinearity
or singularity concerns were evident. Table 3 displays the significant predictors of electronic proactive and reactive prosocial behavior. Electronic proactive prosocial behavior and attentional control skills were significant positively associated with electronic prosocial behavior. There was a significant gender by electronic self-conscious appraisals interaction associated with electronic proactive prosocial behavior ($R^2 = .59$). Follow-up statistics for this interaction indicated that there was no significant relationship between electronic self-conscious appraisals and electronic prosocial behavior for females ($\beta = -.04, t = -0.227, p = 0.822$); however, there was a positive relationship between electronic self-conscious appraisals and electronic prosocial behavior for males, $\beta = .24t = 2.298, p = 0.026$ (Figure 7).

Table 3

*Proximal Processes as Predictors of Electronic Proactive and Reactive Prosocial Behavior (Gender Moderated)*

<table>
<thead>
<tr>
<th></th>
<th>Electronic Proactive Prosocial</th>
<th>Electronic Reactive Prosocial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Constant</td>
<td>0.81</td>
<td>0.30</td>
</tr>
<tr>
<td>Gender</td>
<td>0.18</td>
<td>0.07</td>
</tr>
<tr>
<td>Electronic Reactive Prosocial</td>
<td>0.33</td>
<td>0.08</td>
</tr>
<tr>
<td>Electronic Proactive Prosocial</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-Conscious Appraisals</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>Electronic Emotionality</td>
<td>0.20</td>
<td>0.11</td>
</tr>
<tr>
<td>Attentional Control</td>
<td>0.22</td>
<td>0.11</td>
</tr>
<tr>
<td>Motivational Control</td>
<td>-0.06</td>
<td>0.12</td>
</tr>
<tr>
<td>Gender X Self-Conscious Appraisals</td>
<td>-0.14</td>
<td>0.07</td>
</tr>
<tr>
<td>Gender X Electronic Emotionality</td>
<td>-0.06</td>
<td>0.12</td>
</tr>
<tr>
<td>Gender X Attentional Control</td>
<td>-0.14</td>
<td>0.11</td>
</tr>
<tr>
<td>Gender X Motivational Control</td>
<td>0.24</td>
<td>0.12</td>
</tr>
</tbody>
</table>

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

Significant predictors of electronic reactive prosocial behavior included electronic proactive prosocial behavior, as well as two gender interactions involving attention and motivational control (self-regulation; Table 3; $R^2 = .46$).
Follow-up statistics of the gender by attentional control interaction indicated that the relationship between attentional control and electronic reactive prosocial behavior was non-significant for both males and females (male $\beta = .36, t = 1.33, p = .187$; female $\beta = -.34, t = -1.659, p = .103$; Figure 8). Follow-up statistics for the significant gender by motivational control interaction, demonstrated a positive relationship between motivational control and electronic reactive prosocial behavior for females ($\beta = .45, t = 2.22, p = .031$; Figure 9), and a non-significant relationship for males ($\beta = -.38, t = -1.17, p = .25$; Figure 9).

Figure 7. Gender Moderating Self-Conscious Appraisals and Electronic Proactive Prosocial Behavior
Figure 8. Gender Moderating Attention Control and Electronic Reactive Prosocial Behavior

Figure 9. Gender Moderating Motivational Control and Electronic Reactive Prosocial Behavior
Discussion

The overall goals of the current study were to: a) develop a measure of electronic proactive prosocial behavior, b) explore the personal inputs and proximal processes associated with electronic proactive and reactive prosocial behavior, and c) identify gender differences in the relationships among proximal processes and electronic prosocial behavior. First, results confirmed the structure of the electronic proactive prosocial measure and identified that electronic prosocial behavior is divergent from offline prosocial behavior. Second, the personal inputs and proximal processes associated with electronic proactive prosocial behavior differed from those that were associated with electronic reactive prosocial behavior. The unique associations among personal inputs and proximal process associated with these two types of electronic prosocial behavior highlight the conceptual differences between these behaviors. More specifically, the findings indicate that electronic proactive and reactive prosocial behaviors differ with respect to their functions, associated social risks, and antecedents. Results also suggest that electronic interpersonal contexts that are supportive may foster prosocial behavior, while contexts that are rejecting may support antisocial behavior. Finally, gender differences in the relationship between proximal processes and electronic prosocial behavior suggests that the function of and risk associated with electronic prosocial behavior may differ between males and females.

Measuring Electronic Prosocial Behavior

A reliable measure of electronic prosocial behavior was developed in the current study. The factor structure of the electronic proactive prosocial behavior measure was confirmed in two samples and the measure was structurally distinct from offline prosocial behavior. Although researchers initially hypothesized that electronic social behavior is similar to offline social behavior, current literature indicates that electronic bullying is discrepant from offline forms of bullying (Li, 2007). The unique aspects of electronic communication may distinguish online social behaviors from offline social behaviors. For example, electronic communication is more uninhibited than offline communication, thus youth may be more likely to share negative, hurtful information, but also are more likely to share kind, helpful information (Suler, 2004). In addition, youth can engage with multiple different social groups (e.g., schoolmates, special interest groups, online support groups, etc.) and different types of electronic social platforms online (e.g. gaming, Instagram, etc.). This variety of social interactions and platforms may allow for much more variation in online interpersonal experiences compared to offline social interactions (Kiesler, et al, 1985; Suler, 2004). Finally, the
cognitive-emotional processes associated with offline prosocial behavior, such as moral disengagement, diffusion of responsibility, self-conscious emotions, emotionality, and self-regulation, also are influenced by the unique characteristics of the electronic environment (Derks, et al., 2008; Fox et al., 2009; Martin, et al., 2013; Pornari & Wood, 2010; Smith, et al., 2002). Consequently, current models of offline prosocial behavior cannot be applied unilaterally to electronic prosocial behavior.

To understand electronic prosocial behavior, the current study explored personal inputs and proximal processes associated with electronic proactive and reactive prosocial behavior. Although electronic reactive and proactive prosocial behaviors were strongly positively associated with one another, there were also differences in the personal inputs and proximal processes associated with each. The conceptual differences between these two types of electronic prosocial behaviors provide a framework for understanding the findings. There are differences in the function of these two types of electronic prosocial behavior, as well as the associated level of social risk. The primary function of reactive prosocial behavior is to alleviate the distress of peers and remedy a moral transgression. In contrast, proactive prosocial behavior has many different functions such as, to build popularity or social alliances, build friendships, or repair broken social bonds. With respect to the level of risk associated with electronic prosocial behaviors, engaging in reactive prosocial behaviors, such as defending a peer who is being bullied, has the potential to place an individual in conflict with the individual or group who is bullying. Consequently, the social risk is high. This risk is exacerbated in the electronic context because the person who is bullying may have a large group of peers that support the bullying actions of the individual who are anonymous or invisible online (Machackova, Dedkova, Sevcikova, & Cerna, 2013). As such, the individual who defends may place him or herself in conflict with a large social group whose presence may not be evident. In contrast, typically there is low risk associated with proactive prosocial behaviors because youth do not place themselves in conflict with other peers when engaging in sharing, caring, and kindness with peers.

Reactive and proactive prosocial behaviors also have different social antecedents. The antecedent of reactive prosocial behavior is a moral transgression that causes peer distress. Thus, engaging in reactive prosocial behavior requires the identification of a moral transgression and accompanying moral attitudes that support action in the face of a moral transgression. In contrast, the antecedent in proactive prosocial behavior is variant, determined by the observer, and does not require a moral transgression. Therefore, engaging in proactive prosocial behaviors requires
youth to be attentive to diverse opportunities in their environment that signal an opportunity for a proactive prosocial response. This may be more difficult in the electronic context, because multi-tasking is more frequent in online than offline interactions (Fox et al., 2009). The amount of attention and cognitive load required in the online environment filled with distractions may reduce youths’ capacity to attend to the cues that signal a potential electronic proactive prosocial opportunity. Furthermore, these online distractions may prevent youth from following through on electronic proactive prosocial intentions. The divergent personal inputs and proximal processes associated with electronic reactive and proactive prosocial behavior are explored below within the context of these differences in social risk, function, and antecedents.

**Electronic Reactive Prosocial Behavior**

In the current study, moral disengagement attitudes were negatively associated with electronic reactive prosocial behavior, but not proactive prosocial behavior. Moral disengagement attitudes support amoral behavior both offline and online (Almeida, et al., 2009; Hymel, Rocke-Henderson, & Bonanno, 2005; Perren & Gutzwiller-Helfenfinger, 2012; Pornari & Wood, 2010; Renati, et al., 2012). In contrast, electronically defending may be suppressed by attitudes that condone amoral behaviors or inaction in the face of moral transgressions, such as moral disengagement. Consistent with this tenet, there is a negative association between moral disengagement and offline reactive prosocial behaviors, such as helping (Bandura et al., 1996; Obermann, 2011). Moral disengagement may be particularly relevant in suppressing reactive versus proactive prosocial behavior because reactive prosocial behavior involves the identification and repair of a moral transgression, tasks that are more difficult for individuals with strong moral disengagement attitudes (Paciello, Fida, Cerniglia, Tramontano, & Cole, 2013). In addition, protecting someone against the actions of another peer may involve risk to an individual’s social status. Defenders may need to have strong moral convictions that place a higher value remedying moral transgression than protecting themselves from social harm. The online context may further increase the suppression effect that moral disengagement can have on defending. In the electronic environment, there are potentially large numbers of other helpers, perceived anonymity, and depersonalization, which can cause more diffusion of responsibility than offline contexts (Kwan & Skoric, 2013; Markley, 2000). Diffusion of responsibility fosters moral disengagement attitudes and suppresses helping behavior.
(Bandura, 2002a; Darley & Latane, 1968). Consequently, electronic defending may be easily suppressed by moral disengagement attitudes because the context is ripe for inaction and justification of that inaction.

With respect to proximal processes, motivational control was positively associated with electronic reactive prosocial behavior in females only. Motivational control may be imperative for electronic reactive prosocial behavior due to the level of social risk associated with defending, which places youth in conflict with peers. When a social action has a high risk, youth may need skills to remain motivated toward risky moral goals that benefit others, rather than less risky, more self-serving goals. In the electronic context, remaining motivated toward moral goals may be challenging because the environment fosters impulsivity. For example, people are more disinhibited when they share their thoughts and feelings with others in online social interactions (Stern, 2004, Suler, 2004). Thus, regulating impulses is a critical skill in minimalizing social conflict and fostering positive online social interactions (Kim & LaRose, 2004; Stern, 2004, Suler, 2004). Moreover, there is more diffusion of responsibility in the context of electronic helping because there are large numbers of potential helpers and lack of visibility of helpers, which reduces social pressure to help (Bordia, 1997). In the absence of social pressure to help online, the commitment to the goal of helping may become essential. Motivational control may be essential in fostering reactive prosocial behavior in females because defending is increasingly risky for females. Females tend to have norms that focus more on group harmony and conflict resolution than males, thus the potential for conflict that comes with defending may make defending particularly risky for females (Salmivalli, 2010). Furthermore, the social risk associated with reactive prosocial behavior in females may be amplified online because they value their electronic relationships more than males (Boneva, Kraut, & Frohlich, 2001). Consequently, females’ ability to maintain motivational control may be critical if they are to choose the high risk of defending over the low risk of inaction.

**Electronic Proactive Prosocial Behaviors**

Of the personal inputs examined, electronic bullying and time spent online were both positively associated with electronic proactive prosocial behavior. These findings highlight the different social experiences youth may have online, depending on the peer group and social dynamics of the peer group youth are part of. Some electronic contexts may foster interactions that are competitive or aggressive (e.g., gaming), whereas other contexts foster prosocial interactions (e.g., support group; Braithwaite, Waldron, & Finn, 1999; Cole & Griffiths, 2007; Coulson, Buchanan,
Aubeeluck, 2007). In addition, prior experience within these peer groups influence future interactions (Dodge, et al., 2003). For example, youth may electronically bully in contexts that previously have been rejecting and conversely act prosocially in historically supportive and kind online peer relationships. There may be more diversity in online peer groups and social dynamics because youth have opportunities to interact with diverse groups of peers in different contexts through various platforms and activities. Unlike offline interactions, where youth with antisocial experiences often have little choice but to continue to interact with a historically rejecting peer group, when youth are online they have more freedom to choose alternative social groups that may provide opportunities to build prosocial skills. For example, youth may be members of social networks involving school friends and they also may be members of groups that appeal to their sense of identity such as specific interests groups (e.g., Star Wars, art, gaming, etc.) or support groups (e.g., mental health support groups, LGBTQ support networks, etc.). Consequently, the electronic environment provides a potential for a much larger network than the offline network. Multiple different social dynamics in the different electronic networks and activities that youth are part of may support divergent social behaviors (e.g., antisocial versus prosocial). Furthermore, depending on whether you are choosing to spend time in peer contexts that are unhealthy and rejecting or healthy and supportive, time spent online may foster antisocial or prosocial behavior. Time in unhealthy interpersonal relationships may foster antisocial behavior, whereas, time spent online in healthy interpersonal relationships may provide positively reinforcing social experiences that may foster prosocial behavior. This tenet is consistent with findings linking time online with electronic proactive prosocial behavior in the current study and previous literature linking time online with electronic bullying (Hinduja & Patchin, 2008; Ybarra & Mitchell, 2000).

With respect to proximal processes, both electronic self-conscious appraisals and attentional control were associated with electronic proactive prosocial behavior. Electronic self-conscious appraisals positively predicted electronic proactive prosocial behavior in males, but not females. Consequently, electronic proactive prosocial behavior may serve differential functions for females versus males. Females tend to use proactive prosocial behavior for many different purposes, whereas males may use proactive prosocial behavior primarily as a reparative function (Eisenberg & Lennon, 1983). Males may be using electronic prosocial behavior to alleviate internal self-conscious appraisals after engaging in a social transgression, such as electronic bullying. For example, male youth may
encounter peer conflict and respond by electronically bullying, which may be accompanied by self-conscious appraisals and guilt. They may engage in electronic proactive prosocial behavior to address these self-conscious appraisals. In this way, self-conscious appraisals may support moral behavioral regulation in males. Consistent with this tenant, offline literature has linked self-conscious appraisals, such as shame, to proactive prosocial behaviors (Menesini & Camodeca, 2008). Males may use proactive prosocial behavior for reparation online because the electronic context provides more opportunities for the forms of prosocial behavior preferred by males. For example, males prefer to use instrumental and public forms of prosocial behavior, such as sharing and helping, rather than emotional comforting and caring, which is preferred by females (Eisenberg & Lennon, 1983; Carlo & Randall, 2002). This finding highlights the importance of considering gender differences in the function of proactive prosocial behavior and considering guilt in future examinations of electronic proactive prosocial behavior in males.

Attentional control was positively associated with electronic proactive, but not reactive prosocial behavior. This finding is consistent with offline findings that attentional control and offline proactive prosocial behavior are positively associated with one another (Bellanti & Bierman, 2000; Eccles & Wigfield, 2002; Kochanska, et al., 1997; LaRose, Lin, & Eastin, 2003). Attentional control may be especially salient to proactive prosocial behavior because proactive prosocial behavior requires an individual to be attentive to social cues that signal an opportunity to act prosocially. Consequently, attentional control may enhance the likelihood of recognizing the potential antecedents of proactive prosocial behavior. In the electronic environment, the ability to attend to cues in the social environment may be exceptionally important because of the amplified risk for multi-tasking and the potential to maintain several unrelated social interactions simultaneously (Fox et al., 2009). Thus, the electronic environment may make it may be difficult to maintain attention towards social opportunities for proactive prosocial behavior, making attentional control an important skill for enacting electronic proactive prosocial behavior.

Limitations

Although the current study provides vital first steps in exploring electronic prosocial behavior and its correlates, there are limitations. First, the design of this study was cross-sectional, and, therefore it is not possible to infer causation in the presented models. Future longitudinal studies would enhance understanding of the directionality of effects. Intervention studies that link changes in self-conscious appraisals, attentional control, and motivational
control to subsequent changes in electronic prosocial behavior would also be beneficial. In addition, the current sample was comprised primarily of elementary and junior high school youth, with significantly fewer youth in the grade 9-12 age group. The limited high school sample precluded appropriate examination of developmental stage as a moderator of the relationships among personal inputs, proximal processes, and electronic prosocial behavior. A replication of these findings in a larger sample of high school youth and an examination of age differences in electronic prosocial behaviors would provide a critical developmental context for these findings. The generalizability of these findings is limited given that the sample characteristics such as ethnicity, geographical location, and socio-economic status were not examined. Future replication of these findings in clinical samples and normative samples is required. In addition, the sample size was adequate for obtaining effects for individual relationships in the structural equation modeling analyses, but lacked the power to appropriately compare complex model structures. The regression analysis, with its much more limited sample size was not sufficient to obtain significant small effects (Cohen’s $f^2 = 0.02$). As a result, future examination of the model comparisons presented here in larger samples would be advisable.

**Conclusions**

Using the General Aggression Model as a framework to study electronic prosocial behavior, we have provided three contributions to the literature. First, we have provided support for a new electronic proactive prosocial behavior measure that is divergent from a prominent measure of offline proactive prosocial behavior. Second, we identified personal inputs and proximal process that are differentially related to electronic proactive and reactive prosocial behavior. These results have highlighted the possible divergent functions of each type of prosocial behavior, the potential role of electronic contexts on prosocial or antisocial behavior, and the possible attentional barriers in identifying opportunities to engage in prosocial behaviors. Third, we have suggested potential gender differences in the function of, and risk associated with, electronic prosocial behaviors. Results from this study provide preliminary information about the critical social, cognitive, and emotional correlates of electronic prosocial behavior that should be considered when developing future electronic prosocial behavior intervention research. Given the significance and prevalence of online relationships in youths’ lives, it is essential to understand the critical processes involved in positive online social interactions.
References


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Chapter 5

General Discussion

The three studies of this dissertation tested comprehensive models of electronic bullying, victimization, and prosocial behavior using the General Aggression Model as a guiding framework. First, the results indicated that the General Aggression Model may be helpful as a framework for choosing processes and inputs underlying electronic bullying, victimization, and prosocial behavior; however it may have limited utility in understanding the indirect pathways amongst electronic behaviors and associated processes. For example, the findings highlighted that several personal inputs (e.g., regulatory cognitions), internal states (e.g., physiological and emotional responses), and proximal processes (e.g., emotionality, cognitive reattribution, and self-regulation) may help youth regulate their electronic social behavior. Second, our findings provide preliminary evidence for conceptualizing both electronic bullying and victimization as relational trauma experiences with associated physiological, cognitive, and emotional state responses that are consistent with the Anxious Apprehension Model of Trauma. Third, results highlighted the importance of considering specific processes and states that maintain a power imbalance in the electronic environment between those who bully and are victimized. Finally, we explored how interpersonal contexts, such as interpersonally rejecting environments versus supportive environments, may shape whether youth’s cognitive, emotional, and behavioral regulation skill are activated to help support prosocial or antisocial online behavior. Through exploration of these four key conceptualizations of electronic behavior suggested by the findings of this dissertation, we were able to provide direction for future clinical research.

General Aggression Model for Electronic Behavior

This dissertation provides the first comprehensive examination of a theoretically driven model of electronic prosocial and antisocial peer interactions. The three studies of this dissertation provide preliminary evidence for the utility of the General Aggression Model in understanding electronic social behavior and its relation to the regulation of behavior, attention, and emotion, as well as regulatory cognitions. Although there have been isolated studies examining personal inputs and distal outcomes associated with electronic behavior, a recent meta-analysis has identified that examinations of proximal process and internal state components of the General Aggression Model have
largely been neglected to date (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). The current dissertation has filled this gap by highlighting the regulatory cognitive-emotional processes and internal states that are critical in understanding electronic bullying, victimization, and prosocial behavior. This dissertation also demonstrated that the nature (i.e., direct versus mediation or moderation) and directionality of the relationships among personal inputs, proximal processes may not be explained thoroughly by applying the General Aggression Model to the study of electronic behavior. The specific findings within the personal input, internal state, and proximal process components of the General Aggression Model are outlined below.

**Personal Inputs.** Positive psychology has suggested that skills deficits, which place youth at risk for negative outcomes can be strengthened to foster positive outcomes (Edwards, Mumford, Serra-Roldan, 2007). The personal input findings in this dissertation are consistent with this framework. The relationships of electronic behavior with moral disengagement suggest that deficits in an input can be associated with greater risk antisocial electronic behavior; however, strengths in that same input can foster prosocial electronic behavior. For example, moral disengagement was a personal input that was positively associated with electronic bullying, but negatively associated with electronic defending. These findings suggest interventions that modify a maladaptive cognitive attitude, such as moral disengagement, can simultaneously decrease negative behaviors and increase positive behaviors. Moral disengagement may be one particularly important area to consider in electronic bullying intervention because of the increased potential for depersonalization and diffusion of responsibility online (Kwan & Skoric, 2013; Markley, 2000).

**Internal States: The Anxious Apprehension Model of Trauma.** This dissertation provides the first examination of the relationship between the internal states component of the General Aggression Model and electronic bullying. The General Aggression Model describes internal states as the mechanism through which inputs and proximal processes are related to electronic bullying and victimization behavior. Internal states were examined through the novel application of the Anxious Apprehension Model of Trauma to enhance clinical understanding of electronic bullying and victimization. Our findings supported the model by establishing that physiological arousal, emotional responding, and rejection cognitions are associated with electronic bullying and victimization. Most importantly, our findings identified state rejections cognitions as a mechanism underlying the relationship of
electronic bullying and victimization trauma with emotion arousal. In this way, we have provided preliminary evidence suggesting that those who bully and those who are victimized may be social-emotional vulnerable youth who need support to interpret peer relationships in more healthy ways.

**Proximal Process.** The proximal process component of the General Aggression Model was explored in all three studies by examining the relationship of electronic self-conscious appraisals, emotionality, cognitive reappraisal, and self-regulation with electronic behavior. Self-conscious appraisal were negatively associated with electronic bullying and positively associated with electronic proactive prosocial behavior in males. Together, these findings suggest that self-conscious appraisals serve to regulate social behavior in a positive manner. Lack of self-conscious appraisals may maintain involvement in antisocial behaviors such as bullying, whereas engaging with self-conscious appraisals may motivate prosocial behavior. Thus, the General Aggression Model can apply to both positive and negative electronic behaviors, but the direction of the effect may differ for adaptive and maladaptive behaviors. The electronic context has a strong potential to depersonalize peers by physically distancing social partners (Walther, 1996). Thus, there is increased risk for external appraisals that involve blaming the “victim,” which may reduce youths’ internal self-focused appraisals (Matheson & Zanna, 1988; Sproull & Kiesler, 1986). Consequently, activation of self-conscious appraisals may be an important target for interventions to foster electronic prosocial and prevent antisocial behavior.

The proximal processes related to emotion were also associated with electronic bullying and victimization. We found that electronic bullying and victimization were positively associated with trait emotionality and electronic victimization was negatively associated with cognitive reappraisal. These findings provide consistent support for the importance of emotion and the regulation of emotion in the electronic context. The electronic environment may accompany increased emotionality in youth. For example, the tendency to become more entrenched in one’s own view of social interactions when reading a re-reading incidents alone without social feedback from others can amplify emotionality (Martin, Coyier, VanSistine, & Scroeder, 2013). Electronic bullying and victimization experiences may prime individuals to be more vigilant to their own emotional cues and susceptible to amplified emotionality online. This experience of becoming entrenched in one’s own emotions may further support social conflict and the likelihood of future electronic bullying involvement. It will be important for future research to examine these potential causal
pathways between emotionality, emotion regulation, and electronic bullying involvement as well as, the influence of electronic contextual characteristics on these relationships.

We also explored the role of the decision-making process of the General Aggression Model by examining self-regulation in relation to electronic bullying, victimization, and prosocial behavior. Better self-regulation skills were associated with electronic prosocial behaviors and poorer self-regulation skills were associated with electronic victimization experiences. These findings are consistent with previous offline literature identifying that youth who have been victimized experience self-regulation difficulties, whereas greater self-regulation skills are associated with offline prosocial behavior (Bellanti & Bierman, 2000; Eccles & Wigfield, 2002; Kochanska, Murray, & Coy, 2006; Sage, Kavussanu, & Duda, 2006; Sontag, Clemans, Graber, & Lyndon, 2011). Self-regulation skills are particularly relevant in the electronic context where there is an increased opportunity for divided attention due to multi-tasking and an increased risk for impulsivity (Fox, Rosen, & Crawford, 2009; Suler, 2004; Suniti Bhat, 2008).

Relational Trauma: Power and Loss of Power

Findings from this dissertation support the idea that bullying behavior is an unhealthy way to use power and victimization is an unhealthy loss of power. The discrepant personal inputs, proximal processes, and internal states associated with electronic bullying and victimization is consistent with the power differential between the individual bullying versus the victimized individual. The electronic bullying findings from the current study suggest that those who bully may react to distress and rejection by accessing appraisals and attitudes that function to maintain, increase, or justify their perception of power by externalizing their distress. They may cognitively externalize their distress by appraising external blame, justifying their moral transgressions, and suppressing their physiological experience of distress, rather than reflecting inward and experiencing self-conscious appraisals. Consistent with this tenet, results indicated that electronic bullying was associated with lower self-conscious appraisals, greater moral disengagement, and lower physiological arousal in males. In contrast, victimized individuals’ emotional, cognitive, and physiological responses may function to further lessen their power via internalizing the experience. For example, they may attribute blame to themselves and feel powerless, reducing their capacity to perceive themselves as competent regulate their emotions and stay motivated towards their goals. This is consistent with this dissertation’s findings that electronic victimization was associated with poor cognitive reappraisal and self-regulation skills. The electronic context may
exacerbate these externalizing and internalizing biases for those who electronic bullying and those who are victimized, respectively. For those who electronically bully, the depersonalization and diffusion of responsibility online may increase propensity to lay external blame and justify moral transgressions. For those who have been electronically victimized, the rapid transmission and permanency of electronic victimization material may increase a sense of powerlessness. In addition, the isolation of technological communication may increase propensity to internalize and personalize the bullying experience.

**Interpersonal Context rather than Skills**

The pattern of results presented also suggests that the interpersonal context may influence whether cognitive-emotional processes facilitate prosocial or antisocial electronic peer interactions. For example, time online was associated with electronic prosocial behavior; however, past literature has linked time online with more electronic victimization and bullying (Hinduja & Patchin, 2008; Ybarra & Mitchell, 2004). Thus, time online in supportive peer contexts may facilitate healthy, prosocial electronic relationships, whereas online time in rejecting peer relationships may be associated with unhealthy, antisocial electronic relationships. Furthermore, we found that rejection perceptions are an underlying mechanism of the relationship between electronic bullying and emotion responding. Taken together, these findings indicate that the perception of an interpersonal context may play a key role in shaping electronic social interactions by influencing whether healthy cognitive and emotion processes are activated. This has implications for intervention because, youth may be able to initiate and successfully implement new cognitive and emotion regulation skills they have learned in positive, supportive peer contexts. In contrast, rejecting peer contexts may be a barrier to youth initiating or successfully implementing new cognitive or emotion regulation skills because of the high emotionality and lack of positive feedback from peers in rejecting environments. These findings provide direction for future research that examines whether youth implement their social-cognitive, emotion regulation, and self-regulation skills differently, depending on whether they are interacting with peers in rejecting or supportive online interpersonal contexts. Furthermore, it would be helpful to understand whether these differences in skill implementation then impact youths’ ability to manage online social conflict such as bullying.
Clinical Implications and Future Directions

The results from this dissertation provide directions for clinical practice and future research. The results provide preliminary support for the use of cognitive interventions as well as emotion- and self-regulation skill development to facilitate youths’ online social development. Cognitive skills may be an important focus for intervention because results suggest that electronic bullying and victimization are associated with global cognitive attitudes, such as moral disengagement, and state rejection perceptions. Cognitive skills may include teaching youth skills to brainstorm alternatives to rejection perceptions in hypothetical scenarios. Our results also highlight the interplay of cognition and emotion with respect to self-conscious emotion in electronic bullying as well as the role of emotionality and self-regulation difficulties in electronic victimization. Consequently, interventions should include emotion regulation skills, such as grounding strategies, building emotion vocabulary and awareness, and expanding the view of coping from a focus on only problem solving to integrating emotion-focused coping as well. Mindfulness and impulse control strategies to support adaptive self-regulation skills also may be beneficial. These recommendations for clinical practice require additional longitudinal study and examination of clinical samples to provide stronger evidence of their utility.

The results also highlight potential areas of future research. The current study has demonstrated the utility of the General Aggression Model in identifying gaps in the literature and developing a comprehensive model of electronic behavior. Exploring the General Aggression Model components in more detail by using clinical models, such as the Anxious Apprehension Model of Trauma then allows for an understanding of the detailed relationships within each of the General Aggression Model components. As such, future studies would benefit from the exploratory approach of the General Aggression Model framework followed by application of clinical models that explore whether interventions targeting cognitive mechanisms (e.g., rejection cognitions) alter the relationship between electronic bullying and victimization experiences and emotion processes. In addition, we recommend the inclusion of other individual demographics and situational inputs as moderators of the relationships among proximal processes, internal states, and electronic behaviors. For example, it will be important to know whether electronic contextual factors, peer context (rejecting versus supportive), age, school climate, and social support change the strength of the relationships among personal inputs, proximal processes, internal states, and electronic behaviors. The data from the current
dissertation was entirely cross-sectional, thus, was able to examine only correlational associations among electronic social behaviors and various cognitive, emotional, physiological, and self-regulatory processing. Longitudinal research that examines how electronic bullying and victimization may be trauma experiences that result in future changes in cognitive, emotional, physiological, and behavioral regulation, would be beneficial. Finally, the data from this dissertation was obtained from a fairly heterogeneous, normative sample, without any examination of individual differences such as socio-economic status, culture, and geographical location. Future replication of these findings in additional samples is necessary to ensure the generalizability of these findings to other populations.

Summary

Overall, these studies have contributed to the understanding of online youth behavior. By applying the General Aggression model to electronic social behavior, we have highlighted the regulatory cognitions, emotions, and self-regulation processes involved in electronic behavior. For example, self-conscious appraisals may act to regulate social behavior by discouraging antisocial electronic behavior and simultaneously fostering prosocial electronic social behavior. Second, applying the Anxious Apprehension Model of Trauma to electronic bullying and victimization allowed us to identify common underlying mechanisms in both electronic bullying and victimization. Third, we described how perception of power and rejection may be may be important considerations when studying electronic social behaviors. This dissertation provides a comprehensive understanding of electronic social behaviors. Moreover, the findings have provided support for future clinical research that examines electronic bullying and victimization interventions that are consistent with evidence-based clinical interventions for other relationship problems, trauma, and mental health (Hoagwood, Burns, Kiser, Ringeisen, & Shoenwald, 2001; Lieberman, 2003; Litz, Gray, Bryant, & Alder, 2002).
References


Appendix A

Electronic Bullying and Victimization

Please check the boxes that describe *how often you do* each of these *online* behaviors:

<table>
<thead>
<tr>
<th></th>
<th>How often do you:</th>
<th>Never 0</th>
<th>Rarely 1</th>
<th>Sometimes 3</th>
<th>Often 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Get others to view the mean website or social networking group</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>H</td>
<td>Make suggestions about mean things to do via text messaging, instant messaging, or prank telephone calling</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>K</td>
<td>Post nasty comments on someone’s social networking space</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>P</td>
<td>Say honest, but hurtful things in people’s Honesty boxes</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td></td>
<td>How Often do People:</td>
<td>Never 0</td>
<td>Rarely 1</td>
<td>Sometimes 3</td>
<td>Often 4</td>
</tr>
<tr>
<td>T</td>
<td>Make nasty comments about you on Facebook or in an Honesty box</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>U</td>
<td>Post pictures of you that are embarrassing</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>V</td>
<td>Make mean WebPages or Facebook groups about you</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>W</td>
<td>Say mean things to you on MSN</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>X</td>
<td>Spread rumors or gossip about you online</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
</tbody>
</table>

150
Appendix B

Electronic Self-Conscious Appraisals

C. You go visit your Facebook page to see what pictures people have posted. You notice a picture of you that someone had taken without you knowing it.

<table>
<thead>
<tr>
<th>How likely would you be to think “I hate people distributing pictures of me”?</th>
<th>How likely would you be to think “I have to try to remove the picture right away”?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Not at all likely</td>
<td>☐ Not at all likely</td>
</tr>
<tr>
<td>☐ Slightly likely</td>
<td>☐ Slightly likely</td>
</tr>
<tr>
<td>☐ Somewhat Likely</td>
<td>☐ Somewhat Likely</td>
</tr>
<tr>
<td>☐ Likely</td>
<td>☐ Likely</td>
</tr>
<tr>
<td>☐ Very likely</td>
<td>☐ Very likely</td>
</tr>
</tbody>
</table>

D. You go visit your Facebook page to see what pictures people have posted. You notice a picture of you and comments underneath.

<table>
<thead>
<tr>
<th>How likely would you be to think “This is what people really think of me”?</th>
<th>How likely would you think “I need to find out who posted the comments”?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Not at all likely</td>
<td>☐ Not at all likely</td>
</tr>
</tbody>
</table>
F. You are on MSN and you ask your friend what is happening this weekend. Your friend says, “I am going to the big party on Saturday, of course!”

<table>
<thead>
<tr>
<th>How likely would you be to think “I am always the last to find out”?</th>
<th>How likely would you think “What did I do wrong to not get invited?”?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Not at all likely</td>
<td>☐ Not at all likely</td>
</tr>
<tr>
<td>☐ Slightly likely</td>
<td>☐ Slightly likely</td>
</tr>
<tr>
<td>☐ Somewhat Likely</td>
<td>☐ Somewhat Likely</td>
</tr>
<tr>
<td>☐ Likely</td>
<td>☐ Likely</td>
</tr>
<tr>
<td>☐ Very likely</td>
<td>☐ Very likely</td>
</tr>
</tbody>
</table>
November 11, 2013

Mrs. Ashley Legate Ph.D. Candidate Department of Psychology Queen's University Kingston, ON, K7L 3N6

GREB Romeo #: 6005512Title: "GPSYC-508-10 A School-Based Study of the Emotional and Cognitive Mechanisms of Cyber Bullying, Victimization, and Kindness"

Dear Mrs. Legate:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from November 9, 2013. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. Report to GREB through either ROMEO Event Report or Adverse Event Report Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. Please report changes to GREB through either ROMEO Event Reports or the Ethics Change Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

On behalf of the General Research Ethics Board, I wish you continued success in your research. Yours sincerely,
Joan Stevenson, Ph.D. Chair General Research Ethics Board

c.: Dr. Wendy Craig, Faculty Supervisor and Co-applicant Dr. Stanka Fitneva, Chair, Unit REB Ms. Marie Tooley, Dept. Admin.
July 24, 2013

Dr. Thomas Hollenstein
Assistant Professor
Department of Psychology
Queen's University
Craine Hall, Room 220
Kingston, ON K7L 3N6

GREB Romeo #: 6006207
Title: "GPSYC-536-11 Emotion Co-Regulation in the Dyadic Context"

Dear Dr. Hollenstein:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from August 21, 2013. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. Report to GREB through either ROMEO Event Report or Adverse Event Report Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. Please report changes to GREB through either ROMEO Event Reports or the Ethics Change Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.
On behalf of the General Research Ethics Board, I wish you continued success in your research. Yours sincerely,

Joan Stevenson, Ph.D. Chair General Research Ethics Board

c.: Dr. Isabela Granic, Dr. Wendy Craig, and Miss Ashley Legate, Co-investigators
Dr. Stanka Fitneva, Chair, Unit REB Marie Tooley, Dept. Admin.

[Signature]
Appendix E

Self-Conscious Emotion- Post Cyber Ball

For each item, select the response that best describes how strongly you felt while playing the online game. There are no right or wrong answers.

AS I PLAYED THE GAME I FELT...

<table>
<thead>
<tr>
<th></th>
<th>Didn’t Feel at All</th>
<th>Felt Very Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Humiliated.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. Embarrassed.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. Ashamed.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>4. Like I wanted to hide.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix F

### Electronic Prosocial Behavior Questionnaire

<table>
<thead>
<tr>
<th>How often do you:</th>
<th>Never (0)</th>
<th>Rarely (1)</th>
<th>Sometimes (3)</th>
<th>Often (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Tell people nice things online that you wouldn’t say when you are face to face</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Send videos, pictures, ecards, or forwards to others that you think will make them happy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Use the internet to bring groups of people together that would not otherwise come together (inside or outside of the internet)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Use the internet to communicate with friends and family that live far away</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Find ways to tell friends you care about them online</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Share virtual items with online (e.g. share Farmville items or share secrets/tools in virtual reality games)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J Find ways online to include people you don’t normally hang out with</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K Say nice things in people’s Honesty boxes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
November 27, 2013

Mrs. Ashley Legate Ph.D. Candidate Department of Psychology Queen's University Kingston, ON, K7L 3N6

GREB Romeo #: 6005583Title: "GPSYC-514-10 An Online Study of the Emotional and Cognitive Mechanisms of Cyber Bullying, Victimization, and Kindness"

Dear Mrs. Legate:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from December 26, 2013. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. Report to GREB through either ROMEO Event Report or Adverse Event Report Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. Please report changes to GREB through either ROMEO Event Reports or the Ethics Change Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

On behalf of the General Research Ethics Board, I wish you continued success in your research. Yours sincerely,
Appendix H

Electronic Prosocial Behaviors Predicting Selected Inputs and Processes

![Diagram showing correlations between variables]

- Electronic Prosocial Behaviors
  - Proactive Prosocial Behavior
  - Reactive Prosocial Behavior

- Inputs and Processes
  - Gender
  - Electronic Proficiency
  - Time Online
  - Electronic Self-Conscious Appraisal
  - Moral Justification
  - Bullying
  - Victimization

Correlation coefficients are indicated with symbols: *p < .05, **p < .01, ***p < .001