

**DEVELOPMENT AND VALIDATION OF A SELF-REPORT MEASURE OF  
CYBER-VICTIMIZATION FOR CHILDREN AND ADOLESCENTS**

by

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## **ABSTRACT**

As technology advances, parents and educators have become increasingly concerned about cyber-victimization among children and adolescents. Unfortunately, current research on cyber-victimization is limited by a lack of comprehensive and psychometrically sound measures of the construct. The goal of the current study was to develop and validate a new self-report measure of cyber-victimization. Participants (184 children and adolescents) recruited from community centers completed the new Cyber-Victimization Scale (CVS) at two time points approximately one month apart. At the same time, participants and center staff completed measures of traditional victimization, depression, anxiety, somatization, withdrawal, social acceptance, and self-esteem. The CVS demonstrated good internal consistency and test-retest reliability. Correlations between the CVS and other self-report measures provided strong support for the concurrent and convergent validity of the measure, while correlations between the CVS and staff-report measures provided only moderate support. Future directions are discussed.



## **Chapter 1**

### **INTRODUCTION**

Advances in technology have provided many opportunities for children and adolescents to connect, form friendships, and socialize online. At the same time, technological advances have given rise to the phenomenon of cyber-bullying. Cyber-bullying has been defined as repeated acts of aggression intended to harm, exclude, or embarrass others delivered through mobile phone or Internet-based technologies, such as e-mail, chat rooms, blogs, social networking sites, and text messaging (Patchin & Hinduja, 2006; Williams & Guerra, 2007). Whereas approximately 10% of children report experiencing traditional, in-person victimization (Kochenderfer & Ladd, 1996; Olweus, 1978; Perry, Kusel, & Perry, 1988), the prevalence of cyber-victimization is less certain, because estimates vary so widely based on study methodology. In fact, studies suggest rates of cyber-victimization as low as 9% and as high as 72% for American children (Calvete, Orue, Estévez, Villardón, & Padilla, 2010; Juvonen & Gross, 2008; Williams & Guerra, 2007). Even without clear prevalence rates, the media attention and parental concern that surround cyber-bullying suggest that it poses a significant problem for youth.

One indication of the seriousness of this issue is that a host of negative outcomes have been linked to cyber-victimization. In preliminary empirical studies, as well as anecdotal media reports, these outcomes range from stress, low self-esteem,

anxiety, and anger to depression, substance abuse, and even suicide (Goebert, Else, Matsu, Chung-Do, & Chang, 2011; Leishman, 2005; Patchin & Hinduja, 2006; Topçu, Erdur-Barker, & Çapa-Aydin, 2008; Ybarra, 2004).

### **Cyber-Victimization and Traditional Victimization**

Cyber-victimization and traditional victimization have much in common. For example, many of the negative outcomes listed above are also linked to traditional victimization (Boivin & Hymel, 1997; Boivin, Hymel, & Bukowski, 1995; Egan & Perry, 1998; Kochenderfer & Ladd, 1996; Olweus, 1978; Olweus, 1993; Storch, Brassard, & Masia-Warner, 2003). Furthermore, cyber-victimization and traditional victimization appear to follow similar developmental trajectories, with both constructs peaking around 12-14 years of age (Perry, Hodges, & Egan, 2001; Tokunaga, 2010).

At the same time, theory indicates that cyber-victimization differs from traditional victimization in notable ways. First, cyber-bullying is more likely to be anonymous than traditional bullying. Admittedly, some forms of traditional bullying may take place without the victim being aware of the identity of the bully (e.g., rumor spreading), but this anonymity is much more likely to occur with cyber-bullying. Greater anonymity may lead children to cyber-bully more frequently or more intensely than would be the case for traditional bullying (Underwood & Rosen, 2010; Ybarra & Mitchell, 2004). Second, cyber-bullying can happen outside of school (or other places where children gather), and it can happen at all hours of the day. The inescapable nature of cyber-bullying may make it more psychologically damaging to children than traditional victimization (Raskauskas & Stoltz, 2007). Third, cyber-bullying has the

potential to reach a much larger group of “bystanders” than traditional bullying, which may increase the negative effects for the victim. For example, social network pages may be viewed by hundreds of peers, or text messages may be sent to many peers simultaneously (Dempsey, Sulkowski, Nichols, & Storch, 2009). Finally, cyber-victimization and traditional victimization differ in the forms that they may take. For example, while both traditional bullying and cyber-bullying can involve verbal aggression (e.g., name-calling, insults), social manipulation (e.g., rumor spreading), and social rebuff (e.g., exclusion), physical aggression and attacks against another child’s property are only possible in traditional bullying. On the other hand, only cyber-bullying includes the use of pictures and videos, and these stimuli may provide bullies with particularly effective ways to humiliate victims (Snakenborg, Van Acker, & Gable, 2011).

### **Measures of Cyber-Victimization**

Some current measures of traditional victimization include a few items related to cyber-victimization (Salmivalli, Kärnä, & Poskiparta, 2011). These measures are limited, though, in that they do not provide a comprehensive picture of cyber-victimization. Most do not explicitly describe the various forms or modes of cyber-victimization and instead simply consider cyber-victimization as a sub-category of traditional victimization.

Given the important distinctions between traditional victimization and cyber-victimization, it may be important to study cyber-victimization as a separate construct. For example, Tokunaga (2010) found that, while boys are more likely to be both

perpetrators and victims of traditional bullying, gender differences do not appear to exist in cyber-victimization.

To study cyber-victimization as a separate construct, researchers will require measures that uniquely assess the construct. Although scales designed to exclusively assess cyber-victimization do exist, they suffer from a number of limitations related to both content and psychometrics (Ybarra, Boyd, Korchmaros, & Oppenheim, 2012).

First, some measures include only one or very few items (Allen, 2012; Gradinger, Strohmeier, & Spiel, 2009; Hinduja & Patchin, 2008). These scales typically only allow children to indicate whether they have “been cyber-bullied” and the frequency of this experience. These measures do not assess the content or form of children’s victimization experiences. In addition, children may be less able to recall all experiences of cyber-victimization when items do not explicitly probe for a variety of possible experiences.

Second, some measures do not describe different modes of cyber-victimization. Cyber-victimization can occur over mobile phones and Internet-based technologies, such as e-mail, chat rooms, blogs, social networking sites, and text messaging, and cyber-victimization can include pictures and videos in addition to messages (Patchin & Hinduja, 2006). Several scales do not prompt children to consider these various modes of cyber-victimization when responding (Allen, 2012; Hinduja & Patchin, 2008; Twyman, Saylor, Taylor, & Corneaux, 2010). As a result, children may under-report cyber-victimization.

Third, some measures do not adequately describe the nature and content of cyber-victimization. For example, many measures fail to include items assessing both private and public experiences of cyber-victimization (Li, 2007; Li, 2008; Slonje & Smith, 2008). Private cyber-victimization refers to instances of bullying that simply occur between the bully and victim, such as when a bully sends a single child a threatening text message. Public cyber-victimization, on the other hand, occurs when a bully posts or forwards a bullying message for other children to see. Public cyber-victimization is frequently overlooked in measures of the construct, despite its potential for increased negative outcomes for the victim. In addition, few scales explicitly describe the content of cyber-victimization, such as insults, threats, rumors, exclusion, and attempts to embarrass the victim.

Fourth, most existing measures of cyber-victimization lack strong psychometric properties. In terms of reliability, internal consistency has been assessed for some existing measures, with estimates ranging from .73 to .96 (e.g., Ang & Goh, 2010; Calvete, Orue, Estéves, Villardón, & Padilla, 2010; Hinduja & Patchin, 2010; Williams & Guerra, 2007). However, information on the internal consistency of other measures is not available, and furthermore, test-retest reliability has not been evaluated in any existing measure of cyber-victimization. Without these data, we cannot be sure that the items of existing measures assess the same construct or that the measure assesses the construct with stability across time.

Beyond reliability, a measure should be evaluated in terms of several forms of validity, including concurrent, convergent, divergent, and predictive validity, to ensure

that it assesses the theoretical constructs that it purports to measure. No existing measure of cyber-victimization has been evaluated in terms of any of these types of validity. As a result, it is unclear whether existing scales adequately assess the construct of cyber-victimization.

Given the limitations of current measures of cyber-victimization in terms of both content and psychometric properties, a new measure of cyber-victimization is needed, one that is both comprehensive and psychometrically sound. For this reason, the goals of the current study were two-fold. The first objective was to develop a self-report measure of cyber-victimization with more comprehensive content than has been found in previous measures. The goal was to include multiple items describing different modes (e.g., cell-phone and Internet) and forms (e.g., insults, threats, rumors, exclusion, attempts to embarrass) of cyber-victimization, as well as an explicit description of both public and private cyber-victimization experiences. The second goal was to provide a thorough evaluation of the psychometric properties of this new measure, including factor structure, internal consistency, test-retest reliability, concurrent validity, and convergent validity. It was hypothesized that the newly developed measure would demonstrate strong psychometric properties in all of these ways.

## **Chapter 2**

### **METHOD**

#### **Participants**

Participants were children and adolescents (hereafter referred to as “children”) recruited from 10 community centers in two urban areas in a Mid-Atlantic state. Parental consent forms were distributed to all eligible children in each center, and forms were only returned if parents granted permission for their children to participate. Two hundred seventy-nine parental consent forms were distributed, and 223 forms were returned (80% return/consent rate). Prior to data collection, seven children dropped out of summer programming at the centers. On the day of data collection, a child assent form was administered, and three children refused assent. In addition, 29 children were absent from the centers during data collection. The resulting sample consisted of 184 children (101 female, 83 male). All community centers served predominantly low-income families. Parents of participants reported the following race/ethnicity for their children: 81% African American, 12.5% Mixed, 4.3% European American, and 2.2% Latino American. Participants ranged in age from 7 to 17 ( $M = 9.76$ , Median = 9.00).

#### **Procedures**

Data were collected in the middle of the summer (Time 1) and then approximately one month later at the end of the summer (Time 2). At each time point,

the same data were collected from the child him/herself (self-report), as well as from the staff person at each center who knew the child the best (staff-report).

To gather self-report data, the author or a graduate-level assistant (accompanied by at least two undergraduate assistants) group-administered measures to participating children in each center. Undergraduate assistants circulated to answer children's questions or read measures aloud to children identified by center staff members as having reading difficulties. The measures took approximately 30 minutes to complete. Children were compensated with \$5 at Time 1 and \$15 at Time 2.

Staff-report measures were distributed concurrently and collected approximately two weeks later. Staff were compensated with \$100 at each time point for completing all of the measures for children at their center.

At Time 1, data were collected on the full sample of 184 children. At Time 2, data were collected on 154 of these children, resulting in an attrition rate of 16%. No significant differences emerged on any Time 1 variables between those children who completed both assessments and those children who completed only the Time 1 assessment.

## **Measures**

### **Cyber-Victimization**

Cyber-victimization was assessed with a newly developed 11-item self-report measure, the Cyber-Victimization Scale (CVS). For each item, children rated how often a particular cyber-victimization experience happened to them in the past several



months using a five-point Likert scale ranging from *1 = not at all* to *5 = a whole lot*. See Appendix A for the full scale.

### **Traditional Victimization**

Children completed two self-report measures of traditional victimization; the first scale was the 6-item Peer Victimization Scale (PVS; Austin & Joseph, 1996). Children rated the extent to which items were true for them on a 4-point Likert scale ranging from *1 = really not true for me* to *4 = really true for me*. In terms of validity, previous studies suggest that children who nominate themselves as bullied score significantly higher on the scale than those who do not (Callaghan & Joseph, 1995; Neary & Joseph, 1994). In the current study, the internal consistency for this scale was .78 at Time 1 and .83 at Time 2, and test-retest reliability across the one-month interval from Time 1 to Time 2 was  $r(153) = .54, p < .001$ .

Children then completed the 20-item Peer Victimization Experiences Scale (PVES; Morrow, Hubbard, & Romano, 2012). Responses ranged from *1 = not at all* to *5 = a whole lot*. The PVES is comprised of five four-item subscales: Physical Victimization, Verbal Victimization, Social Manipulation, Property Attack, and Social Rebuff. Each of these factors is uniquely related to increases in children's day-to-day negative affect when both the PVES and negative affect are assessed daily (Morrow, Hubbard, & Romano, 2012). In the present study, internal consistencies for the full scale and each subscale at Time 1 and Time 2 respectively were as follows: Full Scale ( $\alpha = .94$  and  $.94$ ), Physical Victimization ( $\alpha = .79$  and  $.71$ ), Verbal Victimization ( $\alpha = .91$  and  $.85$ ), Social Manipulation ( $\alpha = .81$  and  $.82$ ), Property Attack ( $\alpha = .85$  and  $.79$ ),

and Social Rebuff ( $\alpha = .79$  and  $.82$ ). Furthermore, test-retest reliability in the current study was  $r(153) = .67, p < .001$  for the Full Scale, and as follows for the subscales: Physical Victimization [ $r(153) = .56, p < .001$ ], Verbal Victimization [ $r(153) = .58, p < .001$ ], Social Manipulation [ $r(153) = .53, p < .001$ ], Property Attack [ $r(153) = .58, p < .001$ ], and Social Rebuff [ $r(153) = .59, p < .001$ ].

Staff completed two staff-report measures of traditional victimization. The first was the PVS adapted for staff report; adaptation consisted of changing “I” to “This child” throughout the measure. At Time 1, self- and staff-report PVS scores were marginally correlated [ $r(162) = .14, p = .08$ ], and at Time 2, they were significantly correlated [ $r(146) = .33, p < .001$ ]. Internal consistency for the PVS staff-report scale was  $.88$  at Time 1 and  $.91$  at Time 2. Temporal stability across the one-month interval between Time 1 and Time 2 was satisfactory at  $r(153) = .62, p < .001$ .

The second staff-report measure of traditional victimization was the PVES adapted for staff report (again, by changing “I” to “This child”). At Times 1 and 2, self- and staff-report PVES Full Scale scores were significantly correlated [Time 1:  $r(163) = .28, p < .001$ ; Time 2:  $r(147) = .37, p < .001$ ]. Self- and staff-report subscale scores at Time 1 and Time 2 were also significantly correlated [Physical Victimization, Time 1:  $r(163) = .25, p = .001$  and Time 2:  $r(147) = .21, p = .01$ ; Verbal Victimization, Time 1:  $r(163) = .25, p < .001$  and Time 2:  $r(147) = .34, p < .001$ ; Social Manipulation, Time 1:  $r(163) = .22, p = .004$  and Time 2:  $r(147) = .34, p < .001$ ; Property Attack, Time 1:  $r(163) = .22, p = .004$  and Time 2:  $r(147) = .22, p =$

.007; Social Rebuff, Time 1:  $r(163) = .21, p = .007$  and Time 2:  $r(147) = .27, p = .001$ ]. Internal consistencies for the full scale and each subscale at Time 1 and Time 2 respectively were as follows: Full Scale ( $\alpha = .91$  and  $.91$ ), Physical Victimization ( $\alpha = .72$  and  $.81$ ), Verbal Victimization ( $\alpha = .91$  and  $.92$ ), Social Manipulation ( $\alpha = .85$  and  $.89$ ), Property Attack ( $\alpha = .67$  and  $.53$ ), and Social Rebuff ( $\alpha = .87$  and  $.79$ ).

Temporal stability across the one-month interval between Time 1 and Time 2 was  $r(161) = .54, p < .001$  for the Full Scale and as follows for the subscales: Physical Victimization [ $r(161) = .36, p < .001$ ], Verbal Victimization [ $r(161) = .62, p < .001$ ], Social Manipulation [ $r(161) = .40, p < .001$ ], Property Attack [ $r(161) = .25, p = .001$ ], and Social Rebuff [ $r(153) = .40, p < .001$ ].

### **Depression**

Children completed a 12-item self-report measure of depression, the Child Depression Inventory 2 (CDI 2) Short Version (Kovacs, 2011). The CDI 2 uses a 3-point response scale ranging from *1 = low level of depressive symptom* to *3 = high level of depressive symptom*. This scale is an updated version of the original CDI (Kovacs, 1985) that includes improved normative sampling and two additional items. The short version of the CDI correlates strongly with the full inventory (Kovacs, 1992), which has been validated through extensive psychometric study (e.g., Carey, Faulstich, Gresham, Ruggiero, & Enyart, 1987). In the current study, internal consistency for the scale was .66 at Time 1 and .74 at Time 2, and test-retest reliability was  $r(153) = .70, p < .001$ .

Staff completed a staff-report measure of depression, the 10-item teacher-report version of the Depression subscale of the Behavior Assessment System for Children 2 (BASC-2; Reynolds & Kamphaus, 2004). Age-appropriate versions of the BASC 2 subscales were used for children aged 7-11 and 12-17. The response format for both versions ranged from *1 = never* to *4 = almost always*. All BASC 2 teacher-report subscales used in the current study have demonstrated strong psychometric properties across diverse samples (Reynolds & Kamphaus, 2004). In particular, test-retest reliability has ranged from .73 to .90, interrater reliability has ranged from .23 to .60, and the subscales correlate .36 to .89 with similar subscales from the Achenbach System of Empirically Based Assessment Teacher's Report Form for Ages 6-18 (ASEBA; Achenbach & Rescorla, 2001). In the current study, internal consistency for each age group at each time point ranged from .82 to .88, and test-retest reliability was  $r(153) = .67, p < .001$ .

### **Anxiety**

Children completed a self-report measure of anxiety, the 10-item Multidimensional Anxiety Scale for Children-10 (MASC; March, 1997). This scale uses a 4-point Likert response format ranging from *0 = never true about me* to *3 = often true about me*. The scale is a brief screening version of the 38-item MASC and correlates well with the full measure. It has been shown to have satisfactory test-retest reliability (March, Sullivan, & Parker, 1999), as well as strong validity in diverse samples (e.g., Kingery, Ginsburg, Burstein, 2009; March, Parker, Sullivan, Stallings,

& Conners, 1997). In the current study, internal consistency for the scale was .73 at both Time 1 and Time 2, and temporal stability was  $r(153) = .67, p < .001$ .

Staff completed a staff-report measure of anxiety, the 7-item teacher-report version of the Anxiety subscale of the BASC 2. In the current study, internal consistency for each age group at each time point ranged from .77 to .90, and test-retest reliability was  $r(153) = .56, p < .001$ .

### **Withdrawal**

Children completed a three-item, self-report measure of withdrawal with items selected from the Isolation Scale which has shown adequate reliability and validity in previous research (Masten, Morison, & Pellegrini, 1985). These items included “I play alone,” “I am quiet,” and “I am shy.” Children’s responses indicated frequency, ranging from *1 = not at all* to *5 = a whole lot*. In the current study, internal consistency for the scale was .54, and temporal stability was  $r(153) = .60, p < .001$ .

Staff completed a staff-report measure of withdrawal, the 8-item teacher-report version of the Withdrawal subscale of the BASC 2. In the current study, internal consistency for each age group at each time point ranged from .74 to .91, and test-retest reliability was  $r(153) = .71, p < .001$ .

### **Social Acceptance**

Children completed a self-report measure of social acceptance, the Social Competence subscale of the Self-Perception Profile for Children (SPPC; Harter, 1985). Different versions of the scale were used for children aged 7-11 (6 items) and aged 12-17 (5 items). Children rated how true the item was for them on a 4-point

Likert scale ranging from *1 = really not true for me* to *4 = really true for me*. Three-month test-retest reliability for the subscale ranges from .70 to .87, and the subscale has demonstrated strong convergent, concurrent, and discriminant validity (Harter, 1982; Harter, 1985). In the current study, internal consistency for each age at each time point ranged from .61 to .78, and temporal stability was  $r(153) = .46, p < .001$ .

Staff completed a staff-report measure of social acceptance, the three-item Social Competence subscale of the Teacher's Rating Scale of Child's Actual Behavior (Harter, 1985), which uses the same response format as the self-report version. Harter (1982, 1985) reported similarly strong reliability and validity for this teacher-report subscale. In the present study, internal consistency for the scale was .94 at Time 1 and .92 at Time 2, and test-retest reliability was  $r(153) = .65, p < .001$ .

### **Self-Esteem**

Children completed a self-report measure of self-esteem, the Global Esteem subscale of the SPPC (Harter, 1985). Different versions of the scale were used for children aged 7-11 (6 items) and aged 12-17 (5 items), and both versions used the same SPPC response format described above. Three-month test-retest reliability for the subscale ranges from .69 to .70, and the subscale has demonstrated strong convergent, concurrent, and discriminant validity (Harter, 1982, 1985). In the current study, internal consistency for each age at each time point ranged from .72 to .79, and temporal stability was  $r(153) = .43, p < .001$ .

### **Somatization**

Staff completed a staff-report measure of somatization, the teacher-report

version of the Somatization subscale of the BASC 2 (8 items for ages 7-11; 9 items for ages 12-17). In the current study, internal consistency for each age group at each time point ranged from .68 to .87, and test-retest reliability was  $r(153) = .68, p < .001$ .

### **Analytic Strategy**

Several steps were taken to assess the psychometric properties of the CVS. These steps included: a) exploration of factor structure, b) calculation of internal consistency, c) computation of temporal stability, d) evaluation of construct validity, and e) examination of relations to demographic variables.

### **Chapter 3**

### **RESULTS**

Descriptive statistics for all observed variables are presented in Table 1. For each variable, higher scores represent increased levels of the construct of interest.



Table 1

*Descriptive Statistics*

Variable	Time 1					Time 2				
	Mean	Standard Deviation	Min	Max	Skewness	Mean	Standard Deviation	Min	Max	Skewness
<b>Self-report</b>										
Cyber-Victimization	1.47	0.73	1.00	4.27	1.95	1.41	0.69	1.00	4.09	2.13
Traditional Victimization (PVS)	2.40	0.78	1.00	4.00	0.08	2.23	0.76	1.00	4.00	0.09
Traditional Victimization (PVES)	2.05	0.88	1.00	4.50	0.87	1.82	0.76	1.00	4.55	1.21
Physical	1.67	0.83	1.00	5.00	1.50	1.58	0.70	1.00	5.00	1.90
Verbal	2.33	1.21	1.00	5.00	0.77	2.01	0.98	1.00	5.00	1.07
Social Manipulation	2.14	1.08	1.00	5.00	0.76	1.85	0.97	1.00	5.00	1.22
Property Attack	1.95	1.03	1.00	5.00	1.13	1.67	0.83	1.00	5.00	1.47
Social Rebuff	2.14	1.01	1.00	5.00	0.92	1.97	1.01	1.00	5.00	1.13
Depression	1.37	0.30	1.00	2.50	0.93	1.38	0.33	1.00	2.42	1.06
Anxiety	1.12	0.56	0.00	2.90	0.49	0.93	0.54	0.00	2.30	0.16
Withdrawal	2.12	0.83	1.00	5.00	0.76	1.99	0.85	1.00	5.00	1.08
Social Acceptance	2.75	0.71	1.00	4.00	0.04	2.91	0.65	1.00	4.00	-0.31
Self-Esteem	3.07	0.70	1.00	4.00	-0.53	3.11	0.69	1.50	4.00	-0.24
<b>Staff-Report</b>										
Traditional Victimization (PVS)	1.66	0.69	1.00	3.83	0.81	1.56	0.69	1.00	3.83	1.01
Traditional Victimization (PVES)	1.32	0.38	1.00	2.65	1.63	1.19	0.31	1.00	2.90	2.26
Physical	1.24	0.39	1.00	3.00	2.01	1.13	0.33	1.00	2.75	2.96
Verbal	1.63	0.73	1.00	4.25	1.54	1.40	0.62	1.00	4.00	1.69
Social Manipulation	1.27	0.50	1.00	3.75	2.56	1.19	0.43	1.00	4.00	3.27

Table 1 continued

Variable	Mean	Standard Deviation	Time 1				Time 2			
			Min	Max	Skewness	Mean	Standard Deviation	Min	Max	Skewness
Property Attack	1.11	0.26	1.00	2.50	3.18	1.05	0.15	1.00	2.00	3.79
Social Rebuff	1.33	0.56	1.00	3.75	2.03	1.20	0.41	1.00	3.00	2.37
Depression	1.35	0.42	1.00	3.20	1.75	1.26	0.35	1.00	3.40	2.49
Anxiety	1.34	0.42	1.00	3.14	1.36	1.21	0.32	1.00	2.43	1.74
Withdrawal	1.61	0.62	1.00	3.75	1.37	1.53	0.57	1.00	3.88	1.48
Social Acceptance	3.16	0.88	1.00	4.00	-0.87	3.22	0.78	1.00	4.00	-0.65
Somatization	1.10	0.19	1.00	2.22	2.69	1.06	0.18	1.00	2.11	3.46

PVS: Peer Victimization Scale; PVES: Peer Victimization Experiences Scale.

We identified skewed variables using a cutoff of  $\pm 0.5$  (Glass & Hopkins, 1996). We performed three transformations (logarithmic, square root, and negative reciprocal) in an attempt to normalize identified variables. Log transformations improved skewness the most, and so these log-transformed variables were used in all subsequent analyses.

### **Exploratory Factor Analysis**

Principal components factor analysis with a promax rotation was used to examine the structure of the CVS. Promax rotation was selected as scale items were expected to correlate with one another. One factor was identified with an eigenvalue greater than 1.0 ( $EV = 5.99$ ). This factor was made up of all 11 items and accounted for 54.45% of the total variance. All 11 items had factor coefficients greater than .4, ten items had factor coefficients greater than .6, and 7 items had factor coefficients greater than .7.

### **Reliability**

To estimate the internal consistency of the CVS, Cronbach's alpha coefficient was calculated at each time point. Internal consistency was .91 at Time 1 and .93 at Time 2.

Next, temporal stability was assessed by examining the test-retest correlation over the one-month interval from Time 1 to Time 2. This test-retest reliability was  $r(153) = .72, p < .001$ .

## Validity

### Concurrent Validity

Concurrent validity was assessed by examining bivariate correlations between the CVS and measures of traditional victimization at each time point (see Table 2).

Table 2

#### *Bivariate Correlations Assessing Concurrent Validity of the CVS*

Variable	Correlation with CVS	
	Time 1	Time 2
<u>Self-report</u>		
PVS	0.32***	0.40***
PVES	0.57***	0.60***
Physical	0.42***	0.49***
Verbal	0.38***	0.41***
Social Manipulation	0.50***	0.55***
Property Attack	0.60***	0.57***
Social Rebuff	0.50***	0.57***
<u>Staff-Report</u>		
PVS	0.08	0.21*
PVES	0.16*	0.25**
Physical	0.19*	0.21**
Verbal	0.04	0.19*
Social Manipulation	0.17*	0.17*
Property Attack	0.28**	0.20*
Social Rebuff	0.06	0.23**

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

PVS: Peer Victimization Scale; PVES: Peer Victimization Experiences Scale.

Both self-report measures of traditional victimization (PVS, PVES), as well as all five subscales of the PVES, were positively correlated with the CVS at both Time 1 and Time 2; however, correlations with staff-report measures of traditional victimization were somewhat more varied. Although the CVS was significantly positively correlated with all staff-report measures (PVS, PVES, five subscales of PVES) at Time 2, only four of these seven correlations were significant at Time 1.

### **Convergent Validity Within Time Points**

Convergent validity was evaluated within each time point by examining bivariate correlations between the CVS and other constructs hypothesized to be associated with this measure. As shown in Table 3, the CVS was significantly correlated with all self-report variables (Depression, Anxiety, Withdrawal, Social Acceptance, Self-Esteem) in the expected directions at both time points, with the exception of a marginal association between Social Acceptance and the CVS at Time 1.

Table 3  
*Bivariate Correlations Assessing Convergent Validity of the CVS within Time Points*

Variable	Correlation with CVS	
	Time 1	Time 2
<u>Self-report</u>		
Depression	0.30***	0.40***
Anxiety	0.31***	0.31***
Withdrawal	0.22**	0.30***
Social Acceptance	-0.14†	-0.17*
Self-Esteem	-0.23**	-0.32***
<u>Staff-Report</u>		
Depression	0.08	0.16†
Anxiety	-0.01	0.05
Withdrawal	0.14†	0.17*
Social Acceptance	-0.09	-0.14†
Somatization	0.11	0.12

† $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

However, the only significant association to emerge for a staff-report variable was a positive correlation between the CVS and staff-reported Withdrawal at Time 2. In addition, marginal associations in the expected directions emerged between the CVS and staff-reported Withdrawal at Time 1, between the CVS and staff-reported Depression at Time 2, and between the CVS and staff-reported Social Acceptance at Time 2.

### **Convergent Validity Across Time Points**

Convergent validity was also assessed across time points by examining bivariate correlations between Time 1 CVS scores and Time 2 scores on other constructs hypothesized to be associated with the CVS as shown in Table 4.

Table 4  
*Bivariate Correlations Assessing Convergent Validity of the CVS across Time Points*

Time 2 Variable	Correlation with Time 1 CVS
<u>Self-report</u>	
Depression	0.28**
Anxiety	0.38***
Withdrawal	0.28**
Social Acceptance	-0.22**
Self-Esteem	-0.21*
<u>Staff-Report</u>	
Depression	0.14†
Anxiety	-0.01
Withdrawal	0.12
Social Acceptance	-0.12
Somatization	0.06

† $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Time 1 CVS scores were significantly correlated with all self-report variables at Time 2 (Depression, Anxiety, Withdrawal, Social Acceptance, Self-Esteem). However, only one marginal association (between Time 1 CVS and Time 2 Depression) emerged for the staff-report variables.

### **Relations Between the CVS and Demographic Variables**

One-way ANOVAs were used to examine differences between children of different genders or racial/ethnic groups in scores on the CVS. No significant gender or race/ethnicity differences emerged at Time 1 or Time 2. In addition, the association between age and CVS scores was examined with bivariate correlations. The correlation between age and CVS scores was not significant at Time 1 or Time 2.



## **Chapter 4**

### **DISCUSSION AND CONCLUSION**

The aim of the current study was to develop and validate a self-report measure of cyber-victimization. Our first goal was to develop a measure with more comprehensive content than previous measures, including a description of different modes (e.g., cell-phone and Internet) and forms (e.g., insults, threats, rumors, exclusion, attempts to embarrass) of cyber-victimization, as well as an explicit description of both public and private cyber-victimization experiences.

Our second goal was to provide a thorough evaluation of the psychometric properties of this new measure, the CVS, including factor structure, internal consistency, test-retest reliability, concurrent validity, and convergent validity. Overall, results suggested strong support for the reliability of the CVS, and moderate support for its validity.

In terms of reliability, an exploratory factor analysis of the CVS indicated that all items loaded on to one factor, and internal consistency of the CVS was high at both time points ( $\alpha = .91$  at Time 1 and  $.93$  at Time 2). Temporal stability was also strong at  $.72$  across the one-month interval from Time 1 to Time 2. These results suggest that the CVS is a reliable measure.

Results also indicated strong support for the concurrent validity of the CVS at both time points when compared to both self- and staff-reports of traditional

victimization. Twenty-five out of 28 possible correlations between the CVS and measures of traditional victimization were statistically significant, indicating that children who experience traditional victimization also tend to be cyber-victimized.

Support for the convergent validity of the CVS was also strong for self-report measures of depression, anxiety, withdrawal, social acceptance, and self-esteem. These effects held across concurrent relations at both Time 1 and Time 2, as well as across associations from Time 1 CVS scores to Time 2 scores on these related constructs.

Correlations between staff-report measures of related constructs and self-reports on the CVS, however, were largely non-significant, providing minimal support for convergent validity across reporters. In fact, only one significant relation emerged, a concurrent relation between staff-reports of withdrawal and self-reports on the CVS at Time 2. Several additional marginal associations emerged as well, including concurrent relations at Time 2 between self-reported CVS scores and staff-reported scores on both depression and social acceptance, as well as an across-time relation between Time 1 self-reported CVS scores and Time 2 staff-reported depression.

It is typical and expected for associations to be stronger when assessed within-rater compared to between-raters. In fact, the strong associations that emerged in the current study within-rater should be interpreted with caution due to the likelihood of shared method variance. Beyond that phenomenon, several factors may have contributed to the discrepancy between the strong findings for convergent validity when assessed with self-report measures versus the weak findings when measured

with staff-report measures. First, the staff-report measures employed here were validated for use with teachers. Teachers differ from community center staff members in terms of experience with children and education in child development, both of which may have led staff members to rate children differently than teachers would. In addition, the measures were validated for use in a school setting, and children likely behave differently at school than they do in the less formal and structured setting of community centers. In both of these ways, the measures used with staff have not been well validated for this population and context and so may not have validly assessed children's behavioral and emotional functioning. Second, staff may not have been familiar enough with children to rate their functioning with validity. Particularly at Time 1, staff had only known children for a few weeks, and many children's attendance at the community centers was sporadic.

Finally, it is important to consider why findings were so weak when staff-report measures were used to assess convergent validity but were relatively strong when staff-report measures were used to evaluate concurrent validity. One possibility is that staff can more easily observe the behavioral construct of victimization measured for concurrent validity than emotional or social constructs such as depression or social acceptance assessed for convergent validity (Hinshaw, Han, Erhardt, & Huber, 1992).

Surprisingly, age was not significantly associated with CVS scores at either time point. This finding is likely due to the fact that the sample was quite skewed toward younger children. Although participants ranged in age from 7 to 17 years,

most participants were aged 12 or younger, with a mean age of 9.76. We hypothesize that a significant relation between age and CVS scores would emerge if adolescents were more heavily sampled, and future research should address this question.

The current study is also characterized by additional limitations, which each suggest important directions for future research. First, the current sample lacked racial and economic diversity, with the majority of participants being low-income, African American children. As a result, findings may not generalize to other populations. Future studies should include children across demographic groups to provide a more complete picture of the reliability and validity of the CVS across populations.

Second, as discussed above, the staff-report measures used were originally validated for use by teachers, and it is possible that this factor weakened support for the convergent validity of the CVS. Future studies should relate children's self-report scores on the CVS to teacher ratings of associated constructs in the school setting to provide a stronger assessment of the validity of the CVS.

Finally, and most importantly, the current study did not evaluate all forms of validity of the CVS. Specifically, divergent validity was not assessed, due to time constraints on the number of measures that children could complete in one administration. In addition, predictive validity was not evaluated, because no criterion measure currently exists to compare to the CVS. Future studies should work toward including both divergent and predictive validity in their assessment of the psychometric properties of the CVS.

Currently, two projects are planned or underway in our laboratory to address

many of these limitations. The first project involves the further validation of the CVS in a sample of approximately 2,000 racially and economically diverse 4<sup>th</sup> and 5<sup>th</sup> grade students. This project is being conducted in a school setting, and teacher ratings of the children are being collected. In addition, the range of constructs assessed will allow for the examination of divergent validity. A second study planned for the 2013-2014 school year will evaluate the psychometric properties of the self-report CVS in a racially and economically diverse middle school sample, again with teacher ratings collected in a school setting. This project will provide data on the psychometric properties of the CVS in an older sample of adolescents, youth who are in the midst of the developmental period at which cyber-victimization is hypothesized to peak.

While future projects will certainly continue to clarify the psychometric properties of the CVS, the present study provides a solid foundation for the use of the CVS as a reliable and valid assessment tool to assess cyber-victimization. This is an especially important step for the study of cyber-victimization, a field that is in its infancy. This initial validation of the CVS, along with its continued study, will provide researchers of cyber-victimization with a more comprehensive and psychometrically sound assessment of the construct, allowing scientists to draw more confident conclusions and ultimately to understand and prevent cyber-victimization more effectively.

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## Appendix A

### CYBER-VICTIMIZATION SCALE

When kids use the Internet or cell phones, they often send messages, pictures, or videos to other kids or post them for other kids to see. This page lists different things that might happen when you use the Internet or cell phones. For each sentence, circle how often these things happened to you over the Internet or cell phones in the past several of months.

1. A kid spread rumors or told lies about me.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
2. A kid sent a message/picture/video to me that was scary or threatening.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
3. A kid posted or forwarded something scary or threatening about me for others to see.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
4. A kid sent or posted something just to get me in trouble.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
5. A kid sent something to me that was mean or insulting.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
6. A kid posted or forwarded something mean or insulting about me for others to see.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot

7. A kid left me out of an online group or ignored me on purpose.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
8. A kid posted or forwarded something embarrassing about me for others to see.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
9. A kid sent something to me to make me feel uncomfortable.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
10. A kid posted or forwarded something about me for others to see to make me feel uncomfortable.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot
11. A kid kept on texting, emailing, or messaging me even though I wanted them to stop.	<b>1</b> Not at all	<b>2</b> A little	<b>3</b> Sometimes	<b>4</b> A lot	<b>5</b> A whole lot

## Appendix B

### IRB APPROVAL LETTER



RESEARCH OFFICE

210 Hulihan Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
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DATE: June 1, 2012

TO: Julie Hubbard, Ph.D.  
FROM: University of Delaware IRB

STUDY TITLE: [337172-1] Validating a Measure of Children's Cyber-Victimization

SUBMISSION TYPE: New Project

ACTION: APPROVED (R. Simons)  
APPROVAL DATE: June 1, 2012  
EXPIRATION DATE: May 31, 2013  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category #7

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Clara Simperts at 302-831-2137 or csimperts@udel.edu. Please include your study title and reference number in all correspondence with this office.