HOSTILE ATTRIBUTIONAL BIAS AND SELF-ESTEEM AS MECHANISMS
LINKING EARLIER PEER VICTIMIZATION AND LATER
INTERNALIZING SYMPTOMS

by

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ABSTRACT

Approximately 33% of American youth report serious instances of peer victimization. Peer victimization is linked to internalizing problems, specifically anxiety and depression. The goal of the current study was to evaluate hostile attributional bias (HAB) and self-esteem as mechanisms linking earlier peer victimization and later internalizing problems. The study leveraged longitudinal data to assess whether HAB and self-esteem at age 13 mediate the relations between peer victimization at age 10 and depressive and anxious symptoms at age 15.

Participants were 143 adolescents (mean age = 15.1 years; 52% female). At age 10, participants reported on their victimization using the Comprehensive Scales of Peer Victimization (Morrow et al., 2014). At age 13, participants completed a task assessing HAB (Kupersmidt, Stelter, & Dodge, 2011) and the Rosenberg Self-Esteem Scale (Rosenberg, 1989). At age 15, participants reported on their depressive and anxious symptoms using the Children’s Depression Inventory 2 (Kovacs, 2011) and the Multidimensional Anxiety Scale for Children (March, 1997).

Data were analyzed using path analysis in Mplus Version 8 (Muthén & Muthén, 1998-2017). Victimization at age 10 positively predicts internalizing symptoms at age 15. Self-esteem at age 13 mediated relations between victimization at age 10 and both internalizing symptoms at age 15. However, HAB did not serve as a mediator in the relations between victimization and the internalizing symptoms.
Chapter 1

INTRODUCTION

Approximately 33% of American youth report serious instances of bullying and victimization (“Bullying Statistics & Information,” 2018). Maltreatment by peers is linked to increases in internalizing problems such as anxiety and depression (Karlsson et al., 2014). However, less is known about how peer victimization leads to these outcomes. The goal of the current study was to evaluate two constructs, hostile attributional bias (HAB) and self-esteem, as mechanisms linking earlier peer victimization and the later internalizing problems of anxiety and depression. The primary strength of the current study was the use of longitudinal data to assess this mediational model, with peer victimization assessed at age 10, HAB and self-esteem assessed at age 13, and internalizing symptoms assessed at age 15. Advancing our understanding of the connection between victimization, the mechanisms of HAB and self-esteem, and the outcomes of internalizing symptoms may prove useful both to clinicians treating depressed and anxious youth and researchers examining the links between peer relations and youth psychopathology.

1.1 Description of Constructs

Peer victimization occurs when a more powerful perpetrator behaves in a way aimed at harming a less powerful victim (Olweus, 1994). The construct is distinct from peer conflict in both the intention to cause harm and the power imbalance between peers (Graham & Bellmore, 2007). Peer victimization is associated with a
host of both internalizing and externalizing outcomes, including aggression, attention difficulties, delinquency, anxiety, and depression (Hanish & Guerra, 2002). Peer victimization can occur across three different forms: physical (e.g., kicking and pushing), verbal (e.g., insulting and threatening), and relational (e.g., gossiping and excluding; Hanish & Guerra, 2000). In the current study, we assessed victimization across all these forms and aggregated them into one measure of a youth’s overall experience of victimization before linking peer victimization to the mechanisms and outcomes described below.

The first proposed mechanism of the link between victimization and internalizing problems, HAB, is an important component of Social Information Processing (SIP) theory. SIP theory is a widely-accepted social-cognitive model that explains individuals’ thinking in interpersonal situations. According to this model, in each social interaction, we encode the event, interpret and attribute the meaning of the event, clarify goals, construct responses, choose a response, and then enact the chosen response (Crick & Dodge, 1994). While each step in the SIP model is important for youth social functioning, judgements of attributions for peers’ behavior is most likely to impact emotional functioning (Reijntjes et al., 2011). Youth display HAB when they assume that others’ negative behaviors were intentionally hostile, when in fact the reason for their behaviors was ambiguous (Dodge et al., 2003). For example, a child would display HAB if he assumed that a peer tripped him purposefully, when in fact it was unclear whether the tripping was purposeful or accidental. Thus, HAB is an external attribution of the reasons for others’ negative behavior.

In contrast, the second proposed mechanism, self-esteem, is an *internal* evaluation of one’s worth (Mecca et al., 1989). Sociometer theory describes self-
esteem as an indicator of how desirable an individual is to another person or group of people (Sowislo & Orth, 2013). This theoretical orientation is especially relevant when studying youth, who are heavily invested in peers’ perceptions of them. It also provides a helpful framework linking victimization and self-esteem by suggesting that youth may use victimization experiences to reflect on their own worth to their peer group. Similar to victimization, there are multiple systems for classifying self-esteem, including the distinction between global (or overall) and domain-specific (e.g., academics, athletics) self-esteem (Sowislo & Orth, 2013) and the distinction between trait (generalized) and state (at a specific point in time) self-esteem (Butler et al., 1994). For the purpose of this study, we focus on global trait self-esteem as the broadest marker of youths’ sense of self-worth.

Both of our proposed outcomes, anxiety and depression, fall under the broader umbrella of internalizing problems. These concerns are most problematic for the individuals who suffer from them (as opposed to others) and include withdrawal and somatic complaints in addition to anxiety and depression (Eisenberg et al., 2001). Depression is marked by symptoms including sadness, a loss of interest in activities, and difficulties with eating, sleeping, and concentration (Bhatia & Bhatia, 2007). Anxiety is characterized by anticipatory worry about upcoming situations, avoidance of those situations, and somatic symptoms when faced with those situations (Manassis & Bradley, 1994). Both internalizing disorders can lead to reduced academic performance, peer and familial strain, health problems, increased substance use, and risk of suicide (Jaycox, 2009; Woodward & Fergusson, 2001). Of note, depression is often described as being internally focused on the private self, whereas anxiety is usually depicted as more externally focused on the public self (Mor & Winquist,
2002). This internal/external distinction maps nicely onto the descriptions provided above of HAB as externally focused and self-esteem as internally focused, a mapping that guided the theory and hypotheses of the current study.

1.2 Literature Linking Peer Victimization & Internalizing Symptoms

It is well established that both anxiety and depression can increase concurrently with peer victimization (e.g., Craig, 1998; Snyder et al., 2003; Swearer et al., 2001; Vaillancourt et al., 2013). For example, one such study assessed over 5,000 students aged 11-16 at three different time points. Researchers found that depression and anxiety were proportionally related to how much victimization the students currently experienced (Stapinski et al., 2014). In another example, Rueger and colleagues (Rueger et al., 2011) concluded that, while any length of victimization increases risk of concurrent anxiety and depression, extended periods of peer victimization predict greater increases in both internalizing symptoms.

An even larger literature finds similar relations between earlier peer victimization and subsequent internalizing symptoms when the constructs are examined longitudinally (e.g., Hamilton et al., 2013; Hodges & Perry, 1999; Reijntes et al., 2010; van Lier et al., 2012; Zwierzynska et al., 2013). For instance, a recent longitudinal study first assessed children at age of 8 and found that those children who experienced victimization at this age continued to show symptoms of depression and anxiety for years after the initial evaluation (Schwartz et al., 2015). In a second example, McDougall and Vaillancourt (2015) found that children and adolescents who experience victimization often continue to display depressive and anxious symptoms into adulthood.
1.3 Literature Linking Peer Victimization & Hostile Attributional Bias

A small but consistent existing literature has established that peer victimization correlates with HAB when the two constructs are assessed at the same point in time (e.g., Card & Hodges, 2008; Kawabata et al., 2013; Mathieson et al., 2011). For example, several researchers have found that HAB is a concurrent correlate of youths’ perceived peer victimization (e.g., Kawabata et al., 2013; Nyborg & Curry, 2003; Yeung & Leadbeater, 2007). As another example, Hoglund and Leadbeater (2007) demonstrated that peer victimization concurrently predicted HAB in a sample of 330 middle school students.

Beyond concurrent studies, peer victimization also longitudinally predicts HAB (e.g., Dodge, 2006; Dodge et al., 1990; Graham & Juvonen, 1998; Yeager et al., 2013). For example, one study found that the more children’s peers nominated them as victimized in fifth grade, the more likely they were to demonstrate HAB in sixth grade (Perren et al., 2012). In another study, Yeung and Leadbeater (2007) found that both relational and physical peer victimization in students ages 9 through 11 predicted HAB levels five months later.

1.4 Literature Linking Peer Victimization & Self-Esteem

Across a number of studies, peer victimization is negatively related with self-esteem concurrently (e.g., Boulton & Underwood, 1992; Card et al., 2007; Graham & Juvonen, 1998; Hawker & Boulton, 2000; Olweus, 1994; Storch & Ledley, 2005). A strong example of this work using a sample of 11- to 15-year-olds demonstrated that self-esteem often drops immediately after even an isolated experience of peer victimization, and further victimization only makes this drop more drastic (Rueger et
In another instance, Alsaker and Olweus (2002) showed that victimization concurrently predicted self-esteem in a sample of 11- to 14-year-olds.

A considerable literature supports longitudinal links between earlier peer victimization and later reduced self-esteem (e.g., Hawker & Boulton, 2000; Lopez & DuBois, 2005; Olweus, 1994; Rueger et al., 2011; Storch & Ledley, 2005; Verkuyten & Thijs, 2001). As an example, Boulton and colleagues (Boulton et al., 2010) assessed perceived victimization and global self-esteem five months apart in a sample of 9- to 10-year-olds and found that earlier victimization negatively predicted later self-esteem. A second study of 12- to 15-year-olds suggested that perceived peer victimization predicted decreased levels of self-esteem one year later (Juvonen et al., 2000).

Furthermore, beyond the well-established finding that girls have slightly lower self-esteem than boys (e.g., Bolognini et al., 1996; Graham & Juvonen, 1998; Josephs et al., 1992; Kling et al., 1999; Martinsen et al., 2016), there is some evidence that gender moderates the link between victimization and self-esteem as well, with the effect being stronger for girls than boys. For example, one study found that peer victimization only predicted reduced self-esteem in girls (Grills & Ollendick, 2002), while another study demonstrated that, although both girls and boys had reduced self-esteem after victimization, only girls maintained these reduced levels over time (Rueger et al., 2011).

1.5 Literature Linking Hostile Attributional Bias & Internalizing Symptoms

The vast majority of literature on the concurrent correlates of HAB focuses on externalizing symptoms, but some evidence also supports links between HAB and internalizing symptoms (e.g., Hoglund & Leadbeater, 2007; Kawabata et al., 2013).
For example, a study recruited children ages 8 through 14 and tested for many different cognitive processing biases; among these results, researchers found that anxiety and depression were both concurrently related to HAB (Reid et al., 2006).

A handful of studies also support earlier HAB predicting later internalizing symptoms longitudinally (e.g., Card & Hodges, 2008; Prinstein et al., 2005). For example, 399 students provided data on their attributions towards peers in fourth grade and their internalizing symptoms in sixth grade; negative attributions towards peers predicted later internalizing symptoms (Troop-Gordon & Ladd, 2005).

1.6 Literature Linking Self-Esteem & Internalizing Symptoms

A modest but unified literature supports self-esteem as a negative concurrent correlate of internalizing problems (e.g., Creemers et al., 2012; Graham & Juvonen, 1998). For example, in a study of 279 sixth graders, self-esteem was concurrently linked to internalizing symptoms (Grills & Ollendick, 2002).

Longitudinal studies also support earlier lower self-esteem as predictive of later internalizing symptoms (e.g., Gaylord-Harden et al., 2007; Lee & Hankin, 2009; Leeuwis et al., 2015; Orth et al., 2008; Sachs-Ericsson et al., 2010). For example, in a study of over 1,000 youth assessed every few years between the ages of 3 and 21, lower self-esteem predicted increases in both anxiety and depression (Trzesniewski et al., 2006). In a second example, van Dijk and colleagues (van Dijk et al., 2014) demonstrated that lower self-concept at age 13 predicted depressive and anxious symptoms at age 14-15.

Beyond gender differences in self-esteem, girls also often have higher levels of anxiety and depression than boys (e.g., Allgood-Merten et al., 1990; Hoglund & Leadbeater, 2007; Jacques & Mash, 2004; Nolen-Hoeksema, 2001). Furthermore,
gender often moderates the link between self-esteem and internalizing problems. In fact, across a number of studies, low self-esteem only predicted internalizing symptoms in girls, but not in boys (e.g., Grills & Ollendick, 2002; Lopez & DuBois, 2005).

1.7 The Current Study

The literature reviewed above provides a strong empirical foundation suggesting that: a) peer victimization predicts the internalizing problems of anxiety and depression both concurrently and longitudinally b) peer victimization predicts HAB and self-esteem both concurrently and longitudinally, and c) HAB and self-esteem predict internalizing problems both concurrently and longitudinally. This literature also suggests that the link between peer victimization and self-esteem and the link between self-esteem and internalizing symptoms may both be moderated by gender, with associations being strong for girls than boys.

The goal of the current study was to advance work in this field by investigating HAB and self-esteem as mechanisms linking earlier peer victimization and the later internalizing problems of anxiety and depression. The research design that we used to address this question was rigorous in that we approached the question longitudinally, with data on victimization collected when participants were age 10, data on HAB and self-esteem collected at age 13, and data on internalizing symptoms collected at age 15.

Based on the literature review above, we formulated three hypotheses for the current study. Our first hypothesis was that peer victimization at age 10 would positively predict both anxious and depressive symptoms at age 15. Although this hypothesis has been supported in a number of previous investigations, we felt it was
important to evaluate this link in the current study using the longitudinal design described above.

Second, we hypothesized that both HAB and self-esteem at age 13 would mediate the relation between peer victimization at age 10 and internalizing symptoms at age 15. More specifically, we predicted that HAB would mediate the link between peer victimization and anxiety, whereas self-esteem would mediate the link between victimization and depression. This differential hypothesis is based in theory reviewed above suggesting that both HAB and anxiety are externally focused, whereas both self-esteem and depression are internally focused. Thus, over time, youth who approach the experience of victimization with an external focus may be particularly likely to generalize the mistreatment they receive from a few peers to a more pervasive tendency to attribute hostile intent to peers overall, and this negative attributional view of peers may lead to increases in anxious symptoms, especially anticipatory anxiety surrounding social interactions. In contrast, youth who approach the experience of victimization with an internal focus may be especially likely to suffer blows to their self-esteem when they experience mistreatment from peers, and their negative view of the self may lead to increases in depressive symptoms over time.

Our third hypothesis was that the pathway from peer victimization to self-esteem to depression would be stronger for girls than boys. This hypothesis was based not only on findings that girls experience more difficulties with low self-esteem and depression than boys across the transition from middle childhood to adolescence, but also on work suggesting that the link between victimization and self-esteem and the link between self-esteem and depression are stronger for girls than boys. Thus, when
girls experience peer mistreatment, they may be particularly likely to internalize that mistreatment by progressing down a pathway that includes reductions in self-esteem and increases in depressive symptoms.
Chapter 2

METHODS

2.1 Overview

During a Time 1 (T1) classroom visit, when participants were on average 10 years old, we collected self-report data on children’s peer victimization. During a Time 2 (T2) home visit, when participants were on average 13 years old, we collected self-report data on adolescents’ HAB and self-esteem. During a Time 3 (T3) lab visit, when participants were on average 15 years old, we collected self-report data on adolescents’ depressive and anxious symptoms.

2.2 Participants

T1. During the 2013-2014 academic year, we recruited participants from 74 4th and 5th grade classrooms in 9 elementary schools in the Red Clay Consolidated School District. We sent home parental permission forms with 1,910 children from these classrooms; 62% of these children received both parental consent and child assent and completed T1 data collection ($N = 1191$). The sample included 50% males and 50% females. The racial/ethnic breakdown was 51% European American, 18% African American, 16% Latino American, 8% Asian American, and 7% more than one race. The average age of the children at T1 was 10.15 years. The 9 elementary schools from which these children were recruited varied widely in the percentage of children qualifying for free or reduced lunch (range 6-93%). Of these 1191 children, 989 of their parents provided permission to be re-contacted for future studies.
T2. In 2016-2017, we recruited a subsample of 150 of these youth for additional data collection when they were in 7th-8th grade (56% female, 44% male). The racial/ethnic breakdown of the T2 sample was 60% European American, 12% African American, 11% Latino American, 9% Asian American, and 8% of mixed race or ethnicity. The average age of adolescents at T2 was 13.53 years. At T2, parents reported annual household income as less than $20,000 (3%), $20,000-$50,000 (15%), $50,000-$100,000 (26%), and greater than $100,000 (56%).

T3. In 2019-2020, we recruited a subsample of 143 adolescents from the T1 sample for additional data collection when they were in 10th-11th grade (52% female, 47% male, 1% other). We included as many of the T2 adolescents as possible, and beyond those adolescents, we over-sampled adolescents who reported high levels of victimization at T1 (defined as +.70 standard deviations above the mean). The racial/ethnic breakdown of the T3 sample was 71% European American, 12% African American, 8% Latino American, 6% Asian American, 1% of mixed race or ethnicity, and 2% did not report. The average age of adolescents at T3 was 15.1 years. At T3, parents reported annual household income as less than $20,000 (4%), $20,000-$50,000 (15%), $50,000-$100,000 (23%), and greater than $100,000 (58%).

2.3 Procedure

T1. A graduate student and three undergraduate research assistants (URAs) visited each classroom for one hour. The graduate student group-administered paper-and-pencil measures to children with both parent consent and child assent, including the self-report measure of peer victimization described below. URAs circulated throughout each room to maintain privacy and assist children as needed. We compensated teachers with $100 in cash to use on classroom activities or supplies.
T2. We recruited families using phone numbers and email addresses obtained at T1, and we scheduled families who agreed to participate for a home visit with one graduate student and one URA. At the beginning of each visit, parents provided consent and youth provided assent. Afterward, adolescents completed questionnaires, including the measures of HAB and self-esteem described below, via paper-and-pencil. To address reading difficulties without bringing undue attention to them and to provide adolescents with literacy concerns as much privacy as possible, the graduate student offered to read measures aloud if the adolescent preferred, and if the adolescent selected this option, then offered either to mark responses for the adolescent or to have the adolescent mark his/her own responses on a separate paper.

T3. We again recruited families using phone numbers and email addresses obtained at T1 or T2, and we scheduled families who agreed to participate for a lab visit with a team of three graduate and undergraduate students. At the beginning of each visit, parents again provided consent and adolescents provided assent. Afterward, adolescents completed questionnaires, including the self-report measures of the youths’ depressive and anxious symptoms described below, on a computer via Qualtrics. Staff assisted adolescents with reading difficulties in the same manner as described above at T2.

2.4 Measures

T1. We assessed victimization via self-report using the 20-item Comprehensive Scales of Peer Victimization (CSPV; Morrow et al., 2014). A sample item included “A kid called me mean names.” Children responded on a scale of 1 = not at all to 5 = a whole lot. Internal consistency was strong, with a Cronbach’s alpha of .94. Our lab currently has a paper under review validating this measure in this
sample (Morrow et al., in press). The measure evidenced strong temporal stability across a six-month period ($r = .60, p < .001$). In terms of concurrent validity,

the CSPV related positively to other self- and teacher-report measures of peer victimization. With respect to construct validity, the CSPV related positively to self-report of anxious and depressive symptoms and teacher-report of anxious symptoms, depressive symptoms, somatic symptoms, withdrawal, and school avoidance. Items were averaged to create the variable T1 Victimization, with higher scores reflecting more victimization.

**T2.** Adolescents self-reported on their HAB using the Social Information Processing Application (Kupersmidt et al., 2011). This measure assesses an array of social information processing constructs including HAB. The measure includes 8 scenarios in which one adolescent ambiguously provokes another adolescent (causes harm in a way that leaves it unclear whether the harm was intentionally inflicted). A sample scenario involves an adolescent tripping over a peer’s foot in the classroom. Each scenario is followed by 15 questions, four of which assess HAB. These questions include “Do you think the boy/girl intended to be mean?”, “How disliked or rejected would you feel if this happened to you?”, “How disrespected would you feel if this happened to you?”, and “How angry would you feel if this happened to you?”. Adolescents responded on a scale of $1 =$ definitely not mean (not at all disliked or rejected; not at all disrespected; not at all angry) to $5 =$ definitely mean (very, very disliked or rejected; very, very disrespected; very, very angry). Cronbach’s alpha across the four items and across the eight vignettes was good at .89. Items were averaged to create the variable T2 Hostile Attributional Bias, with higher scores reflecting greater hostile attributional bias.
Adolescents self-reported on their self-esteem using the 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989). A sample item included “I feel that I’m a person of worth, at least on an equal plane with others.” Adolescents responded on a scale of $1 = \text{strongly disagree}$ to $4 = \text{strongly agree}$. Cronbach’s alpha in the current sample was acceptable at .86. The RSES is a valid and reliable measure of adolescent self-esteem (e.g., Hagborg, 1993; Keith & Bracken, 1996). Regarding convergent and discriminant validity, in both community and clinical samples, the RSES relates positively to other measures of global self-esteem, including the Lerner Self-Esteem Scale (Savin-Williams & Jaquish, 1981) and the Global Self-Worth factor of the Harter Self Perception Profile for Adolescents (e.g., Hagborg, 1993), as well as negatively to emotional and behavioral problems, including somatic, depressive, and anxious symptoms (e.g., Bagley et al., 1997; Bagley & Mallick, 2001). Furthermore, factor analyses suggest a one-factor model across samples (e.g., Hensley, 1997; Shevlin et al., 1995). Items were reverse-scored as needed and averaged to create the variable T2 Self-Esteem, with higher scores reflecting greater self-esteem.

**T3.** We assessed anxious and depressive symptoms via self-report. Adolescents completed the 39-item Multidimensional Anxiety Scale for Children (MASC; March, 1997). A sample item includes “I feel tense;” participants responded on a scale of $1 = \text{never true about me}$ to $4 = \text{always true about me}$. The MASC has demonstrated good internal reliability across diverse clinical and community samples (Grills-Taquechel et al., 2008; Kingery et al., 2009; Rynn et al., 2006). Additionally, it is positively related to other measures of anxiety (Baldwin & Dadds, 2007; Rynn et al., 2006) and is appropriately accurate in distinguishing children with anxiety disorder diagnoses from those without (e.g., Grills-Taquechel et al., 2008). Cronbach’s alpha in
the current sample was .91. Items were reverse-scored as needed and averaged to create the variable T3 Anxiety, with higher scores reflecting greater anxiety.

Second, adolescents completed the 12-item Children’s Depression Inventory 2 Self-Report Short Version (CDI-2; Kovacs, 2011). For each item, participants chose one of three statements (e.g., “I am sad once in a while,” “I am sad many times,” “I am sad all the time”), forming a response scale of 1 to 3. The CDI-2 has demonstrated good internal consistency and short-term stability and is able to distinguish youth with Major Depressive Disorder from those with other psychopathology (e.g., Bae, 2012). Cronbach’s alpha in the current sample was .82. Items were reverse scored as needed and averaged to create the variable T3 Depression, with higher scores reflecting higher depression.
Chapter 3
RESULTS

3.1 Missing Data

Our final data set included 211 adolescents. All participants had scores for T1 Victimization, 150 participants had scores for T2 Self-Esteem, 149 participants had scores for T2 Hostile Attributional Bias, and 143 participants had scores for T3 Depression and T3 Anxiety. Missing data were handled using full information maximum likelihood (FIML). Of note, we re-ran all analyses described below using a data set that included only those 81 participants with complete data across all variables. The pattern of all findings remained the same, with the exception of the path from T1 Victimization to T2 Hostile Attributional Bias, which changed from statistically significant to marginal.

3.2 Descriptive Statistics and Bivariate Correlations

Table 1 includes descriptive statistics for all study variables. Table 2 includes bivariate correlations between these variables. Our first hypothesis was that peer victimization at age 10 would positively predict both anxious and depressive symptoms at age 15. As can be seen in Table 2, this hypothesis was supported, with T1 Victimization correlated with T3 Depression at .23, \( p < .01 \), and with T3 Anxiety at .18, \( p < .05 \).
3.3 Testing the Mediational Path Model

Our second hypothesis was that both HAB and self-esteem at age 13 would mediate the relation between peer victimization at age 10 and internalizing symptoms at age 15. More specifically, we predicted that HAB would mediate the link between peer victimization and anxiety, whereas self-esteem would mediate the link between victimization and depression. We tested this hypothesis in *Mplus* version 8 (Muthen & Muthen, 1998-2017) using the path model depicted in Figure 1.

To evaluate model fit, we examined four indices. The chi-square statistic ($\chi^2$), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Squared Residual (SRMR) provided significance tests of goodness of fit, whereas the Comparative Fit Index (CFI) assessed the fit of our model relative to an independent baseline model. We considered models to fit the data well when the $\chi^2$ was non-significant, CFI was above .95, RMSEA was below .06, and SRMR was below .08.

The initial model did not provide a good fit for the data [$\chi^2$ (5) = 23.75, $p < .05$; CFI = .80; RMSEA = .13; SRMR = .16]. Modification indices suggested adding a path from T2 Self-Esteem to T3 Depression. With this modification, the model fit the data very well [$\chi^2$ (4) = 2.73, $ns$; CFI = 1.00; RMSEA = .00; SRMR = .04). Figure 2 depicts the significance and directions of the pathways in the model. T1 Victimization positively predicted T2 Hostile Attributional Bias and negatively predicted T2 Self-Esteem. T2 Self-Esteem negatively predicted T3 Depression and T3 Anxiety. However, T2 Hostile Attributional Bias did not predict T3 Anxiety.

This pattern of results suggests that T2 Self-Esteem mediated the relations between T1 Victimization and both T3 Depression and T3 Anxiety, in that direct paths from T1 Victimization to T3 Depression or T3 Anxiety were not needed for the model
to fit the data well. To provide a statistical test of the significance of these indirect effects, we used a resampling method known as bootstrapping. In this approach, we obtained an empirical sampling distribution for the mediated effects by generating 5000 random samples from the data set to construct a 95% confidence interval. Results indicated that these indirect effects were significant for both T3 Depression (lower bound = .04; upper bound = .14; \( p < .001 \)) and T3 Anxiety (lower bound = .04; upper bound = .17; \( p < .01 \)).

### 3.4 Testing Gender Moderation of the Path Model

Finally, we tested whether the model differed between boys and girls by comparing constrained and unconstrained models using a chi-square difference test. The model as a whole was not moderated by gender, \( \chi^2 \) difference (5) = 2.55, \( p = .77 \). Therefore, we did not proceed with testing gender moderation for individual pathways.
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Victimization</td>
<td>1.00</td>
<td>4.20</td>
<td>1.47</td>
<td>.56</td>
</tr>
<tr>
<td>T2 Self-Esteem</td>
<td>1.60</td>
<td>4.00</td>
<td>3.37</td>
<td>.46</td>
</tr>
<tr>
<td>T2 Hostile Attributional Biases</td>
<td>1.31</td>
<td>4.09</td>
<td>2.45</td>
<td>.56</td>
</tr>
<tr>
<td>T3 Depression</td>
<td>1.00</td>
<td>2.42</td>
<td>1.41</td>
<td>.31</td>
</tr>
<tr>
<td>T3 Anxiety</td>
<td>1.36</td>
<td>3.31</td>
<td>2.08</td>
<td>.44</td>
</tr>
</tbody>
</table>
Table 2: Bivariate Correlations

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>T1 Victimization</td>
<td>-.25**</td>
<td>.17*</td>
<td>.23**</td>
</tr>
<tr>
<td>2.</td>
<td>T2 Self-Esteem</td>
<td>-.14†</td>
<td>-.59***</td>
<td>-.50***</td>
</tr>
<tr>
<td>3.</td>
<td>T2 Hostile Attributional Bias</td>
<td>.11</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>T3 Depression</td>
<td></td>
<td></td>
<td>.57***</td>
</tr>
<tr>
<td>5.</td>
<td>T3 Anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Figure 1: Initial Path Model
Figure 2: Final Path Model

Note: * $p < .05$; ** $p < .01$; *** $p < .001$
Chapter 4
DISCUSSION

Some of our study hypotheses were supported while others were not. More specifically, our first hypothesis, that peer victimization at age 10 would positively predict anxious and depressive symptoms at age 15, was supported. Our second hypothesis was partially supported, in that evidence emerged for the victimization to self-esteem to depression pathway but not for the victimization to HAB to anxiety pathway. Our third hypothesis, that the pathway from victimization to self-esteem to depression would be moderated by gender, was not supported.

4.1 The Pathway from Victimization to Self-Esteem to Depression

As hypothesized, self-esteem mediated the relation between earlier victimization and later depression. This finding supports previous literature showing that peer victimization predicts reduced self-esteem (e.g., Hawker & Boulton, 2000; Olweus, 1994), as well as literature suggesting that low self-esteem predicts increased symptoms of depression (e.g., Lee & Hankin, 2009; Orth et al., 2008). A smaller body of work assessed self-esteem as a mediator between victimization and depression, and most of these studies found that self-esteem mediated the relation between victimization and depression, similar to the current study (e.g., Bosacki et al., 2007; Soler et al., 2013).

This finding maps nicely onto our theory of internally- versus externally-focused constructs. We theorized that both self-esteem and depression stem from a
similar inward focus on the self; self-esteem derives from an internal evaluation of someone’s own worth (Mecca et al., 1989), and depression relates strongly to someone’s private self-focus (Mor & Winquist, 2002). Children who are peer-victimized may begin to evaluate themselves as not being worthwhile, and then this inward focus on low self-worth may translate into the sort of private self-focus that predicts future depressive symptoms during adolescence.

4.2 The Pathway from Victimization to HAB to Anxiety

Contrary to our second hypothesis, HAB did not mediate the relation between earlier victimization and later anxiety. Although victimization at age 10 positively predicted HAB at age 13, HAB at age 13 was unrelated to anxiety at age 15. Of note, the literature supporting links from victimization at HAB (e.g., Dodge, 2006) and from HAB to internalizing symptoms (e.g., Card & Hodges, 2008) is quite small. It is possible that our findings fit the “file-drawer syndrome,” in that there may be many additional studies with these nulls results that have not been published.

Our theory of internally- versus externally-focused constructs suggested that HAB is an externally-focused attribution of other people’s motives for behavior (Dodge et al., 2003) and anxiety centers around an external focus on the public self (Mor & Winquist, 2002). However, although anxiety is focused on the external stimuli of other people (Manassis & Bradley, 1994), it is considered an internalizing symptom because it manifests as negative internal feelings (e.g., Hunsley, 1987; Zahn–Waxler et al., 2000). This reasoning may explain why self-esteem and not HAB mediated the relation between victimization and anxiety.

In contrast, HAB predicts increases in anger (e.g., Hawkins & Cougle, 2013) and even aggression (e.g., Hoglund & Leadbeater, 2007), externally-focused emotions
and behaviors. Perhaps a different, internal attributional bias in SIP theory may prove to be a better mediator between peer victimization and anxiety. For example, previous work has found that self-blame attributional bias predicts internalizing difficulties such as anxiety (Perren et al., 2012).

4.3 The Pathway from Victimization to Self-Esteem to Anxiety

Unexpectedly, self-esteem mediated the relation between earlier victimization and later anxiety in addition to mediating the relation between earlier victimization and later depression. This finding is consistent with some previous literature suggesting that peer victimization predicts reduced self-esteem (e.g., Rueger et al., 2011) and low self-esteem predicts increases in anxious symptoms (e.g., Leeuwis et al., 2015). Existing literature also suggests self-esteem mediates the relation between victimization and anxiety (e.g., Bosacki et al., 2007; Soler et al., 2013; Ybrandt & Armelius, 2010). Furthermore, and in contrast to our theorizing, these findings suggest that the link between victimization and anxiety is better conceptualized in terms of the internalizing nature of anxious symptoms than in terms of the external focus of anxiety on other people.

4.4 Limitations of the Current Study

The current study was marked by three primary limitations. First, all measures were collected via self-report, resulting in possible shared method variance across variables. Future studies should strive to assess these constructs using different or multiple reports, such as teacher and peer report.

Second, construct overlap between self-esteem and both depression and anxiety may account for the finding that self-esteem mediated the relation between
victimization and these internalizing symptoms. In fact, although some researchers conceptualize self-esteem as a mechanism driving the development of internalizing problems (e.g., Aunola et al., 2000), other researchers view low self-esteem as its own internalizing problem (e.g., Becker et al., 2017; Prinstein et al., 2005). Future studies should seek to use more differentiated measures of self-esteem and internalizing problems or conduct item overlap analyses to avoid this issue.

Finally, future researchers should strive to include measures of the outcome variables of depression and anxiety at each time point in the mediational model. This approach would allow for the prediction of change in these internalizing symptoms over time.

### 4.5 Implications of the Current Study

The results of the current study suggest that peer victimization during childhood predicts increases in anxiety and depression, as well as decreases in self-esteem, years later in adolescence. These findings highlight the importance of intervention and prevention programs targeting bullying and victimization, such as the Olweus program (Olweus & Limber, 2010) or the KiVa program (Salmivalli et al., 2011). They also suggest that adults who interact with youth they know to be victimized (i.e. parents, teachers, therapists) should be on the lookout for the development of these internalizing symptoms so that they may be addressed early.

These findings also indicate avenues for future research. First, researchers should consider examining specific forms of victimization, such as physical versus verbal victimization, to better understand differentiated links to HAB, self-esteem, and internalizing symptoms. Second, adding externalizing symptoms to the model could help us understand whether HAB acts as a mediator in the relation between
victimization and externalizing outcomes, while self-esteem acts as a mediator in the link between victimization and internalizing outcomes. Although work on victimization, HAB, and externalizing outcomes is plentiful, placing this pathway in the context of a larger model that also includes internalizing outcomes associated with victimization may improve our understanding of these differentiated pathways. Finally, it may be helpful to examine self-esteem at a finer-grained level as well (i.e. trait versus state, global versus domain-specific) to understand the specific types of self-esteem that mediate the relation between earlier victimization and later internalizing symptoms. Regardless, the current study suggests both the real-world importance of examining outcomes linked to peer victimization as well as the need for further research in this area.
REFERENCES


