

Peer Victimization in Youth with Tourette's Syndrome and Chronic Tic Disorder: Relations with Tic Severity and Internalizing Symptoms

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Abstract The present study analyzed rates of peer victimization in children with a chronic tic disorder as compared to children with type 1 diabetes and healthy controls. The associations among peer victimization, tic symptom severity, and psychological symptoms, as well as the potential mediating relationship between peer victimization, tic severity, and child internalizing symptoms, were also explored. Children with tics displayed higher rates of peer victimization than control groups, and peer victimization in children with tics was positively correlated with tic symptom severity, loneliness, anxiety symptoms, and parent report of child internalizing symptoms. Results also supported the hypothesis that peer victimization mediates the relationship between tic symptom severity and loneliness. Findings highlight the importance of the assessment and treatment of psychosocial variables in children with chronic tic disorders, including social functioning and peer relationships.

Keywords Tics · Peer victimization · Children · Tourette's disorder · Internalizing symptoms

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Physically and interpersonally aggressive interactions among children have received increased scientific and public scrutiny over the past decade (c.f., Lyznicki et al. 2004; Storch and Ledley 2005). In general, this literature has been confined to studying rates and psychosocial correlates in community samples of youth (e.g., Nansel et al. 2001, 2004; Storch et al. 2003a) or among chronic medical conditions with relatively high base rates (e.g., type 1 diabetes, obesity; Janssen et al. 2004; Storch et al. 2006a, 2007). While informative, such study has not advanced practitioners' understanding of the peer problems that children with more rare chronic illnesses may endure.

With this in mind, one pediatric population that has received little empirical attention in the bullying literature is Tourette's Syndrome. Tourette's Syndrome (TS) is a neuropsychiatric disorder characterized by involuntary motor and vocal tics that last for longer than a year and begin in childhood or early adolescence (American Psychiatric Association 2000). TS runs a waxing and waning severity course with symptom exacerbations often occurring during stressful periods (Coffey et al. 2004; Leckman 2003). Comorbidity among children with tics is the rule rather than exception and often represents a primary reason for seeking treatment (Dooley et al. 1999). Externalizing behaviors such as disruptive behavior disorders and inattention, hyperactivity, and impulsivity are quite common (Budman et al. 2000; Robertson et al. 2002; Saccomani et al. 2005; Sukhodolsky et al. 2003), as are obsessive-compulsive symptoms (Cardona et al. 2004; Pauls et al. 1986; Saccomani et al. 2005), and mood and anxiety disorders (Coffey et al. 2000; Robertson et al. 2002).

Although the role of stress is increasingly being studied to understand the course of childhood tic disorders (e.g.,

Findley et al. 2003), no known empirical research has examined peer victimization as a stressful event that may relate to symptom severity. Yet, it is not surprising that children with TS or a chronic tic disorder may be exposed to higher rates of bullying. Children with tics may be at greater risk than unaffected peers to be bullied due to the presence of tics that may be stigmatizing and misunderstood (Shapira 2002), thereby serving as aggressors' targets. Peer difficulties may also arise due to negative social perceptions by peers and teachers that perpetuate the belief that children with tics are "different" or have a serious psychiatric condition (Boudjouk et al. 2000; Friedrich et al. 1996). Gender has been related to victimization with boys being subjected to more acts of overt victimization as compared to girls (Crick and Bigbee 1998; Crick et al. 1999; Crick and Grotpeter 1996), and a trend for girls to be more relationally victimized than boys (Crick and Bigbee 1998; Crick et al. 1999; Crick and Grotpeter 1996; Paquette and Underwood 1999). Perhaps most concerning is the notion that chronic peer victimization has been linked to a number of negative adjustment indices. In a meta-analysis of cross-sectional research, Hawker and Boulton (2000) found the mean correlation between peer victimization and depression ($r=0.45$), anxiety ($r=0.25$), and loneliness ($r=0.32$) to be positive and significant. Prospective studies, although fewer in number than cross-sectional reports, have documented significant and positive relations with depression (Bond et al. 2001; Nishina et al. 2005; Shytle et al. 2003), general anxiety (Bond et al. 2001), social anxiety (Nishina et al. 2005; Storch et al. 2005a), loneliness (Kochenderfer and Ladd 1996; Kochenderfer-Ladd and Wardrop 2001; Nishina et al. 2005), somatic complaints (Nishina et al. 2005; Rigby 1999), and poor school functioning (Kochenderfer and Ladd 1996).

Despite the intuitive reasons for children with TS and chronic tic disorders to be at increased risk for victimization, there are relatively few data on the rates of peer victimization or social-psychological correlates of peer victimization in this population. Dykens et al. (1999) discuss teasing and peer rejection issues in children with tics, but do not present data regarding the frequency of these phenomena or psychosocial morbidity. Shady et al. (Champion et al. 1988; Shady et al. 1988) found that 68% of participants reported impaired peer relations, as well as difficulty initiating and maintaining friendships. Stokes et al. (1991) reported that peers and teachers rated children with TS as less popular and more withdrawn than an age and gender matched control group. Carter et al. (2000) and Bawden et al. (1998) report data suggesting that youth with TS are at risk for peer relationship problems but do not directly address the issue of peer victimization.

Although empirical data are limited, the clinical experiences of the authors have suggested that peer victimization and tic symptom severity may be related in two ways. Children may be targeted due to their overt tics; in other words, tic severity would be expected to positively relate to peer victimization. An alternative model suggests that peer victimization may mediate the relations between tic severity and internalizing symptoms, helping to understand, in part, the high rates of internalizing comorbidity found in youth with tic disorders. To this end, it was hypothesized that tic severity would positively relate to peer victimization that, in turn, would contribute to greater levels of internalizing symptoms. To explain the mechanism of this model, victimized youth may incorporate the negative evaluations inherent to peer assaults into their self-views, resulting in greater internalizing distress (Grills and Ollendick 2002; Storch and Masia-Warner 2004).

In conceptualizing this research, the authors' experiences working with children with tics suggest that peer victimization is a frequent experience for many. Further, the relations that previous studies have documented between peer victimization and negative social-psychological adjustment appear to hold true in youth with tics, as many of these children are experiencing significant adjustment problems (e.g., depressed affect, anxiety, loneliness) anecdotally related to peer torment (e.g., the child reports distress related to being bullied). Therefore, the purpose of this study is to examine peer victimization in youth with TS and chronic tic disorders. There were four study goals: (1) To examine rates of peer victimization relative to healthy children and chronic disease controls (children with type 1 diabetes [T1 D]); (2) examine if peer victimization is associated with tic symptom severity and other psychological symptom indices; (3) examine if motor and vocal tics are differentially related to outcomes; and (4) examine if peer victimization mediates the relationship between tic severity, and internalizing symptom indices (e.g., anxiety, loneliness, and parent-rated internalizing symptoms). Based on clinical experiences and data from chronically ill children (e.g., Storch et al. 2006a), it was predicted that peer victimization would be elevated relative to control samples, and positively correlate with child-rated indices of anxiety and loneliness, parent-rated internalizing symptoms, and clinician-ratings of tic severity. Given that youth may internalize negative peer feedback, which is considered core to the development of internalizing difficulties, it was predicted that peer victimization would mediate the relationship between tic severity, and internalizing symptom indices. Specifically, tic symptom severity is expected to relate to increased peer victimization, resulting in increased anxiety and loneliness, and parent-reported internalizing symptoms.

Materials and Methods

Participants

Participants were obtained from three sources: (a) children and adolescents diagnosed with TS or a chronic tic disorder ($n=59$; boys=41) seen between January 2004 and November 2005 for outpatient visits in the University of Florida Department of Psychiatry Child and Adolescent OCD and Tic Clinic; (b) children and adolescents diagnosed with T1 D ($n=52$; boys=24) seen during the same time period in the Department of Pediatrics for outpatient clinical management of their diabetes; and (c) children and adolescents attending well-child visits to their pediatrician ($n=52$, boys=23). Control subjects are the same as those used in Storch et al. (2007). Participants' ages ranged from 8 to 18 years ($M=12.2$ years, $SD=2.6$ years), with an ethnic distribution as follows: Caucasian (89.6%), African-American (4.9%), Hispanic (2.5%), Asian (1.8%), and 'Other' (1.2%). Regarding the family income of children with tics, one family reported earning less than \$19,999, six reported earning between \$20,000 and \$39,999, ten reported earning between \$40,000 and \$59,999, 13 reported earning between \$60,000 and \$79,999, and 25 reported earning over \$80,000. Four families did not report their income range. Significant gender differences existed among groups ($p<0.05$; See Table 1), and because gender was also related to peer victimization, this variable was controlled for in future analyses of group differences. Children with T1 D or without a chronic illness only completed the peer victimization measure. Forty-two mothers, 16 fathers, and one custodial grandparent of participants with tics completed parent forms. Some children with tics were receiving active treatment, either psychosocial and/or pharmacological, as determined by their health care provider (s). This variable was not systematically collected.

TS or chronic tic disorder and comorbid diagnoses were made by a board certified child psychiatrist with 10 years of experience by using all available clinical information (Leckman et al. 1982). This method, which is considered the gold standard for diagnosis, incorporates information

from the Yale Global Tic Severity Scale (YGTSS; Leckman et al. 1989), clinical interview, and responses to other measures. Tic diagnoses were also confirmed by one of two licensed clinical psychologists with extensive experience based on a discussion of symptoms and viewing relevant quantitative data. Comorbid diagnoses, when present, consisted of the following: Attention Deficit Hyperactivity Disorder ($n=28$), Obsessive–Compulsive Disorder ($n=25$), Major Depression ($n=6$), Generalized Anxiety Disorder ($n=7$), Oppositional Defiant Disorder ($n=6$), Social Phobia ($n=2$), Asperger's Disorder ($n=3$), and Panic Disorder ($n=1$). Diagnoses of T1 D were made by a board certified pediatric endocrinologist with 25 years of experience based on all clinical information available at their respective endocrinology clinic visit (e.g., plasma C-peptide test, fasting glucose test). Psychiatric diagnoses were not made for youth in the non-Tic groups.

Measures

Schwartz Peer Victimization Scale The Schwartz Peer Victimization Scale (SPVS; Schwartz et al. 2002) is a five-item self-report questionnaire of perceived peer victimization experiences. Items that encompass overt and relational forms of victimization are rated on a four-point scale (1=never; 4=almost every day; possible range=4–20) for their frequency over the past 2 weeks. A total score is derived from summing all items. The SPVS has good internal consistency ($\alpha=0.75$), a stable one-factor structure, and strong and positive correlations with teacher and peer reports of victimization (Schwartz et al. 2002). Cronbach's α in this sample was 0.88.

Yale Global Tic Severity Scale The Yale Global Tic Severity Scale (YGTSS; Leckman et al. 1989) is a semi-structured clinician-rated instrument of motor and phonic tic severity. The clinician initially notes the presence of motor and phonic tics based on child and parent reports over the previous week and behavioral observations. Ratings are then made for motor and phonic tics on five domains each: number, frequency, intensity, complexity, and interference. A separate, one-item impairment rating is also included that captures distress and impairment in interpersonal, academic, and occupational realms due to all endorsed tics. Good interrater agreement (intraclass correlation coefficients [ICC] for index scores ranging from 0.62 to 0.85; Leckman et al. 1989) and 7-week stability (ICCs for index scores ranging from 0.77 to 0.90; Storch et al. 2005b) was found for the YGTSS scores. Convergent validity was supported with moderate to strong relations between YGTSS scores and scores on clinician rated tic severity and impairment measures. Discriminant validity was demonstrated by weak to moderate relations with

Table 1 Descriptive information for study groups (children with Tic Disorder, Type 1 diabetes, and healthy controls)

Group	Tic Disorder	Diabetes	Control
Mean Age (SD)	11.4 (2.6)	12.4 (2.3)	12.3 (2.6)
% Boys	69.5% ^a	46.2% ^{a,b}	44.2% ^b
% Caucasian	96.6%	82.7%	88.5%

For a given variable, groups are significantly different from each other if they do not share the same superscript; groups that share the same superscript are not significantly different from each other.

clinician-ratings of ADHD impairment and OCD, child-rated anxiety and depression, and parent-rated aggression and ADHD.

Child Behavior Checklist The Child Behavior Checklist (CBCL; Achenbach 1991) is a commonly used 113-item questionnaire that assesses parental reports of their child's behavioral and emotional functioning. Parents are asked to evaluate the degree to which a behavior is true for their child on a 0–1–2 scale to score items (0=not true; 1=somewhat or sometimes true; and 2=very or often true). The CBCL has established psychometric properties across a variety of clinical and non-clinical populations (Achenbach 1991). For the purposes of this study, the Internalizing Scale score was used. Cronbach's α in this sample was 0.87.

Asher Loneliness Scale The Asher Loneliness Scale (ALS; Asher et al. 1984) is a 24-item self-report measure (eight filler items) of feelings of loneliness, social adequacy, and subjective estimations of peer status. The eight filler items were excluded in order to minimize the time needed to complete the assessment battery. Factor analysis of the measure revealed one primary factor for the 16 items (Asher and Wheeler 1985). In addition, the ALS was positively associated with depression and negative peer nominations (Asher and Wheeler 1985; Bagner et al. 2004), and negatively correlated with positive peer nominations and play ratings (Asher and Wheeler 1985). Cronbach's α in this sample was 0.90.

The Multidimensional Anxiety Scale for Children The Multidimensional Anxiety Scale for Children (MASC; March et al. 1997) was developed to assess anxiety symptoms in children in community and clinical populations. The MASC has 39 items answered on a 0 (never true about me) to 3 (often true about me) scale. A total score is computed by summing all items. Good internal consistency ($\alpha=0.90$; March et al. 1997) and three-week and three-month test–retest reliability have been found ($r=0.88$ and 0.87 ; March et al. 1999). The MASC correlates moderately with the Revised Children's Manifest Anxiety Scale ($r=0.63$) and did not significantly correlate with the Children's Depression Inventory (CDI; $r=0.19$) or Abbreviated Symptom Questionnaire (ASQ; $r=0.07$). Cronbach's α in this sample was 0.88.

Procedures

The relevant institutional review board granted permission to conduct this research, and written parental consent

and child assent was obtained for each participating youth prior to administering measures. Parents and children were told that their participation was voluntary, and they could refuse permission without negative consequences of any kind. Families were compensated \$5.00 for their participation and funds were given directly to the consenting parent for distribution. After the clinical interview, approximately one half of families completed questionnaires prior to the YGTSS. The other half were administered the YGTSS prior to completing child- and parent-report measures. A trained research assistant provided instructions for each measure and was present to answer any questions. Masters or doctoral level clinical psychology trainees administered the YGTSS to both the child and parent jointly in a private clinical office. YGTSS training consisted of an instructional meeting about the YGTSS with the first author, four practice interviews, and four directly observed interviews. Control children completed the SPVS and several measures relevant to other studies during their regularly scheduled endocrinology or well-child appointment. Consent rates for each group were high and did not statistically differ (59/65=91% of children with tics; 52/70=74% for children with T1 D; 52/60=80% for healthy children).

Results

Descriptive Analyses and Group Differences

Means and standard deviations (SD) of child reports of peer victimization are presented in Table 2. Using a cutoff score of 1 SD above the non-clinical mean of this sample ($M=9.8$), 27% of children with tics were classified as reporting clinically significant peer victimization scores compared to 9% of children with T1 D and 9% of healthy controls. Using a cutoff score of 1 SD above the mean for the Asher and Wheeler (1985) normative sample, clinically significant loneliness was reported by 26% of children with tics. Eight percent of children with tics reported clinically significant levels of anxiety based on the standardized normative data for the MASC (March et al. 1997). For this sample, 32.2% ($n=19$; T -score range=38–108) of children with tics had

Table 2 Means and standard deviations on peer victimization across children with tic disorders, Type 1 diabetes, and healthy controls

Group	N	Mean	Standard Deviation
Tic Disorder	59	8.6 ^a	3.8
Diabetes	52	6.4	1.7
Control	52	7.2	2.8

^a Significant difference ($p<0.05$)

clinically significant internalizing symptoms (based on the cutoff of $T \geq 70$; Achenbach 1991).

Gender differences emerged as a function of peer victimization, with boys reporting significantly higher levels of peer victimization than girls ($t=2.8, p<0.01$). Neither age ($r=0.10, p=0.5$) nor ethnicity ($F=0.36, p=0.55$) was related to peer victimization.

Prior to conducting analyses of group differences, a power analysis was conducted to determine the minimum number of participants that were required to find moderate group differences. Using data from Storch et al. (2006a, b, 2007), there was power=0.78 using a sample of 50 youth per group to detect an effect size of 0.25 with a p -value of 0.05. Given this, analyses were conducted as planned. An analysis of covariance (ANCOVA) controlling for gender indicated significant group differences in peer victimization $F(2, 159)=3.1, p<0.05$. Planned contrasts revealed that children with tics reported significantly higher peer victimization than children with diabetes ($p<0.02$) and controls ($p=0.05$). Reports of peer victimization did not differ between children with diabetes and controls ($p=0.48$).

Relations between Peer Victimization and Psychological Symptom Indices among Children with Tic Disorders

The relations among peer victimization and psychological symptom indices were examined by Pearson product-moment correlations (see Table 3). Modest, positive correlations were found between peer victimization and tic symptom severity, loneliness, anxiety symptoms, parental reports of internalizing symptoms, and level of impairment associated with tics.

Relations between Peer Victimization and Tic Typology

Peer victimization was significantly and positively associated with phonic tics ($r=0.28, p<0.05$) but not motor tics ($r=0.15, p>0.05$). The magnitude of the relations between

peer victimization and tic typology were examined using Fisher's r to z transformation. Results revealed no significant differences in the magnitude of relations ($p>0.05$) (see Table 3).

Peer Victimization as a Mediating Variable

The hypothesized mediational model posits that more severe tic symptoms would contribute to increased peer victimization, which in turn would relate to increased symptoms of loneliness, anxiety, and parent-rated internalizing behaviors. Baron and Kenny's (1986) guidelines for mediation were followed to test this model. Four separate regression analyses were computed for each of the three dependent variables: child-rated loneliness, child-rated anxiety, and parent-rated internalizing behaviors. The following criteria are necessary for mediation: (I) the predictor (tic symptoms) is significantly associated with the outcome (loneliness, anxiety, or internalizing behavior); (II) the predictor is significantly associated with the mediator (peer victimization); (III) the mediator is associated with the outcome variable (with the predictor accounted for); and (IV) the addition of the mediator to the full model reduces the relation between the predictor and criterion (as assessed by the Sobel (1982) test).

Loneliness as the Outcome Regression techniques were used to identify the direct effect of tic symptom severity on loneliness (criterion I) and peer victimization (criterion II). Results indicated that tic symptom severity significantly predicted 10% [$F(1,52)=6.0, p<0.05$] of the variance in loneliness, meeting the first requirement for mediation and predicted 12% [$F(1,52)=7.2, p<0.05$] of the variance in peer victimization, satisfying the second requirement for mediation. In accordance with criterion III, peer victimization predicted 11% [$F(2,51)=7.0, p<0.01$] of the variance in loneliness with the effects of tic symptom severity accounted for in the equation. Finally, the relation between tic symptom

Table 3 Pearson product moment correlations between peer victimization and indices of psychological symptoms for children with Tic disorders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) YGTSS Motor Scale	1.0	0.57***	0.71***	0.82***	0.15	0.11	0.18	-0.12
(2) YGTSS Phonic Scale		1.0	0.71***	0.84***	0.28*	0.20	0.32*	0.10
(3) YGTSS Impairment			1.0	0.96***	0.46***	0.23	0.32*	0.12
(4) YGTSS Total Score				1.0	0.38**	0.21	0.32*	0.06
(5) Peer Victimization					1.0	0.41**	0.43**	0.40**
(6) MASC						1.0	0.35**	0.31*
(7) ALS							1.0	0.07
(8) CBCL-Internalizing								1.0
Mean (Standard deviation)	13.4 (6.3)	7.9 (7.3)	17.8 (13.8)	39.5 (24.7)	8.6 (3.8)	38.4 (16.0)	42.9 (6.2)	12.8 (9.9)

YGTSS Yale Global Tic Severity Scale, MASC Multidimensional Anxiety Scale, ALS Asher Loneliness Scale, CBCL Child Behavior Checklist raw score. Means and standard deviations represent raw scores.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$ (2-tailed)

severity and loneliness was reduced from 10 to 3% [$F(1,51)=2.2, p=0.14$] when peer victimization was accounted for, demonstrating criteria IV for mediation (see Table 4). The Sobel significance test (Sobel 1982), which tests for a decrease in the total effect of the predictor on the criterion after controlling for the mediator, also supports criteria IV (Sobel $z=2.02, p<0.05$), namely that peer victimization mediates the relation between tic symptom severity and loneliness. The addition of the mediator reduced the direct path between tic symptom severity and loneliness to a non-significant value, suggesting full mediation. This mediating model accounted for 12% more variance in loneliness than the simple direct model. Figure 1 presents these data.

Anxiety as the Outcome Analyses did not support the hypothesis that peer victimization mediates the relationship between tic symptom severity and anxiety, as criterion I was not substantiated.

Internalizing Behavior as the Outcome Analyses did not support the hypothesis that peer victimization mediates the relationship between tic symptom severity and parent-rated internalizing behavior, as criterion I was not substantiated.

Discussion

The results from the current study expand practitioners’ understanding and insight into the peer relationships and psychological correlates of children with tics. Relative to children with T1 D or healthy children, there were higher rates of peer victimization among children with tics (27%). This finding helps elucidate the types of variables that may contribute to elevated rates of peer victimization. Children with T1 D are required to engage in a variety of unique health maintenance behaviors, such as dietary restrictions and strict daily medical regimens, both of which could be potential targets for teasing or gossiping by other children (Storch et al. 2006a). However, only children with tics demonstrated an increased risk for peer victimization,

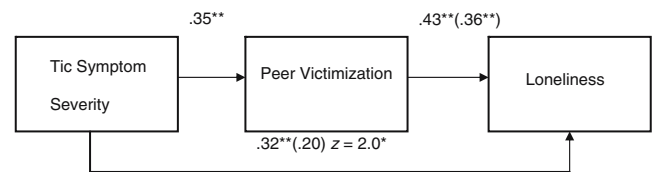


Fig. 1 Mediation model for associations between Tic symptom severity and loneliness as mediated by peer victimization

suggesting that the presence of tics (and/or comorbid psychiatric symptoms) may invite peer attacks. There was also a slight, albeit non-significant, difference in the relations between phonic and motor tic severity. Perhaps the disruptive and obvious nature of phonic tics is more detrimental to peer relationships than motor tics, which may go unnoticed or be effectively hidden. This would be in line with others who suggest that tic-related impairment is greatest for phonic symptoms (Shytle et al. 2003). Finally, the present results are consistent with others (e.g., Hawker and Boulton 2000) in documenting positive cross-sectional relations between peer victimization and anxiety, loneliness, and general internalizing symptoms. Current beliefs regarding this relationship suggest that victimized youth internalize negative peer comments contributing to distress (Grills and Ollendick 2002; Storch and Masia-Warner 2004). Although this is concerning in and of itself, victimized youth are more likely to avoid educational and social activities for fears of bullying which may impact development in these domains (Storch et al. 2003a).

The current study also provides information about the mediating role of peer victimization in the relationship between tic symptom severity and internalizing symptoms. It was hypothesized that tic symptom severity would be positively related to peer victimization, which in turn would contribute to symptoms of anxiety and loneliness and parent-rated child internalizing behaviors. This model was only supported for loneliness, which might be considered a reflection of perceived social support and status (Asher and Wheeler 1985). This finding suggests that the relationship between tic severity and loneliness may be impacted by negative peer interactions. While tics may be a primary focus of treatment, the present results suggest that the treating clinician should also address psychosocial variables to improve interpersonal functioning. For example, treatment for some children with tics may need to include social skills training, as they work to initiate and maintain appropriate friendships and navigate negative peer interactions. Additionally, the child may be coached to find ways to control their tics while in school or other social settings to reduce opportunities for peer attacks. Treatments such as Habit Reversal Therapy (HRT; Deckersbach et al. 2006; Woods et al. 2006) hold strong promise in this regard.

Contrary to hypotheses, peer victimization did not mediate the relationship between tic severity and child-

Table 4 Mediation hierarchical regression analysis predicting outcome: Final block of the regression

Step	Variable(s)	R ²	ΔR ²	F	β
Outcome Variable=Loneliness					
1		0.18	0.18	11.5**	
2	Peer Victimization	0.22	0.03	2.2	0.43**
	Peer Victimization				0.36**
	Tic Symptom Severity				0.20

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

reported anxiety or parent-reported internalizing symptoms. In both cases, the first criterion for a mediational model was not met; namely, tic severity was not directly related to child anxiety or internalizing symptoms. This is somewhat surprising given the elevated rates of comorbid anxiety and depressive disorders found in children with tics (e.g., Coffey et al. 2000; Robertson et al. 2002). Nonetheless, these children may still be at risk for the development of internalizing problems, particularly if the social isolation and resulting negative consequences of victimization are not addressed. Indeed, moderate and positive relations were found between peer victimization and anxiety, loneliness, and general internalizing symptoms. It is important for future research to examine the long-term trajectories of these children to better understand the factors that influence the development of internalizing psychopathology.

The results suggest that social functioning and peer relationships need to be a focus in both the assessment and treatment of children with tics. Pharmacological and psychosocial (e.g., HRT) management of tics may be particularly important to reduce the number of tics in the presence of peers. Children with tics may also benefit from informal (e.g., practicing with parents or siblings) or formal social skills training to prepare the child to respond appropriately to teasing or rejection due to tics. As the literature on the assessment and treatment of childhood tics is advanced, it is important to examine whether successful resolution of tics leads to improved psychosocial functioning. This most likely depends on the individual child, and whether the course of the illness has led to actual delays or hard to reverse impairment in the child's social and emotional development and the degree of tic severity and comorbid pathology.

The results from this study must be viewed in light of its limitations. First, the current study is correlational in nature, which precludes the exploration of causal relationships among study variables. An important future direction involves prospective studies to elucidate the directionality of current effects. Second, many variables besides peer victimization may affect the relationship between tic severity and loneliness, as the present model only explained a modest amount of the variance. Research should explore the many different factors that can affect this relationship. Third, the reliance on self-report of peer victimization may also be viewed as a limitation, as perhaps there should have been additional peer relationship measures. However, the SPVS demonstrates good psychometric properties, and researchers have suggested that child self-report is more accurate than peer or parent report in the area of peer maltreatment, particularly since some forms of victimization are difficult to observe (Storch and Ledley 2005). Finally, the relationship between tic severity and child internalizing symptoms may have been limited by use of

parent report only for internalizing behavior problems. Parents often misreport their child's internalizing symptoms (Achenbach 1995). Future studies should be mindful of this methodological constraint, and attempt to gain a better sense of the child's overall psychological experience by incorporating more self-report measures.

Within these limitations, this study adds to the literature examining psychosocial correlates and peer relationships in children with tics. However, further investigation is needed to understand the nature of these relations, potential mediating and moderating variables, and appropriate intervention strategies. First, research should investigate the different factors that impact rates of peer victimization in this population. Future studies should explore other factors impacting the occurrence of peer victimization, such as duration of the disorder, the child's perceptions of the disorder along with the perceptions of family, teachers, and friends, and child and family coping and adjustment to the disorder. In addition, the question of whether peer victimization decreases contingent upon successful treatment remains unanswered. In fact, some preliminary research in pediatric social phobia patients suggests that victimization improves following successful treatment (Dent et al. 2002). Second, research should also move beyond the construct of peer victimization and examine the broader social interaction patterns of children with tics. Although the presence of the tics per se may lead to higher rates of peer victimization, it is also possible that children with tics struggle with other peer problems that may be related to having tics or inherent to the overall characterization of the condition (e.g., comorbid disorders). Longitudinal research that assesses a multitude of psychosocial variables is needed to clarify these relationships, and identify the factors that lead to negative outcomes in children with chronic tics.

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