Published in final edited form as:
Anxiety Stress Coping. 2010 October ; 23(5): 493–513. doi:10.1080/10615800903494127.

A longitudinal examination of factors predicting anxiety during the transition to middle school

Amie E. Grills-Taquechel[a,*], **Peter Norton**[a], and **Thomas H. Ollendick**[b]

[a] Department of Psychology, University of Houston, 126 Heyne Building, Houston, TX 77204, USA

[b] Department of Psychology, Virginia Polytechnic and State University, 460 Turner Street, Blacksburg, VA 24060, USA

Abstract

The transition from elementary to middle or junior high school is commonly regarded as a period of stress and turmoil for young adolescents, and has been associated with changes in anxiety and other psychological problems. However, less is known about risk and resilience factors that may predict these changes. This study examined changes in anxiety, as well as predictors of these changes among 77, predominantly Caucasian (88%), male and female (52%) adolescents from Grades 6 to 8. Repeated measures analysis of variance was conducted to examine the predicted grade and gender differences. Multiple regression analyses were conducted to examine the prediction of eighth grade anxiety symptoms by sixth grade self-worth, perceived social acceptance, and social support, as well as the potential moderating role of gender in these relations. Results suggested a significant decrease in anxiety, particularly social anxiety, over this period for boys but not girls. Examination of predictors of changes in anxiety suggested that, in general, global self-worth, social acceptance, and gender were each associated with overall and social anxiety. Findings are integrated with extant literature on developmental changes associated with anxiety and school transitions and clinical implications of these findings are discussed.

Keywords

late childhood/early adolescence; academic/school transitions; anxiety; risk/resilience; self-worth; developmental trajectories

Anxiety disorders are among the most prevalent mental health concerns reported by children and their parents (Beidel, 1991; Fergusson, Horwood, & Lynskey, 1993; Verhulst, vanderEnde, Ferdinand, & Kasius, 1997), with prevalence rates averaging about 12% (Cartwright-Hatton, McNicol, & Doubleday, 2006; Costello et al., 1988, 1996; Kashani et al., 1987; Kessler, Berglund, Demler, Jin, & Walters, 2005). Moreover, an additional subset of children experience substantial subclinical anxiety and related problems – symptoms that frequently have an adverse impact on development and that may worsen over time

*Corresponding author. aegrills@uh.edu.

(Ohannessian, Lerner, Lerner, & von Eye, 1999). Furthermore, once present, anxiety symptoms often persist into adulthood if treatment is not received (Bosquet & Egeland, 2006; Cantwell & Baker, 1989; Ebata, Petersen, & Conger, 1990; Last, Strauss, & Francis, 1987; Ollendick & King, 1994; Seligman & Ollendick, 1999). In addition, children and adolescents with anxiety concerns commonly experience concurrent academic (e.g., school avoidance), social (e.g., peer rejection, social incompetence), and emotional (e.g., low self-worth, depression) difficulties (e.g., Grills & Ollendick, 2002a; Kovacs, Gatsonis, Paulauskas, & Richards, 1989; McGee, Feehan, Williams, & Anderson, 1992). Adolescence has been noted as a particularly salient time for the development of anxiety (Clark, Smith, Neighbors, & Skerlec, 1994; Hale, Raaijmakers, Muris, van Hoof, & Meeus, 2008; Kashani & Orvaschel, 1990; Kessler et al., 2005; Ohannessian et al., 1999). According to the most recent National Comorbidity Survey Replication (Kessler et al., 2005), the median age of onset for anxiety disorders (averaged across all anxiety disorder categories) is 11 years, with an interquartile range (IQR) of 6–21 years. The most common anxiety disorder noted to develop in adolescence is Social Anxiety (median onset=13 years, IQR=8–15); however, the IQR for several additional disorders occurs during the childhood and early adolescent years (i.e., Specific Phobia=5–12, Separation Anxiety Disorder=6–10, Obsessive–Compulsive Disorder (OCD)=14–30, Agoraphobia without Panic=13–33). Thus, further understanding is needed of risk/protective factors that may affect the progression of anxiety symptoms during this pivotal developmental period.

One relatively universal experience of early adolescence that has been purported to influence anxiety and related symptoms is the transition from elementary school to middle or junior high school. Increases in anxiety symptoms (Blyth, Simmons, & Carlton-Ford, 1983; Greene & Ollendick, 1993; Harter, Whitesell, & Kowalski, 1992), as well as declines in grades (Simmons & Blyth, 1987), intrinsic motivation (Harter et al., 1992), self-perceived academic competence (Harter et al., 1992), academic interests (Dotterer, McHale, & Crouter, 2009), and self-views (Blyth et al., 1983; Eccles, Midgley, & Adler, 1984; Harter, 1982; Simmons, Blyth, Van Cleave, & Bush, 1979) have all been reported following the transition to junior high/middle school. Researchers have suggested that young adolescents may be at increased risk for developing these psychosocial difficulties due to the various changes that occur in their learning environments (cf. Eccles et al., 1984; Eccles, Midgley, Wigfield, & Buchanan, 1993), along with other normative developmental experiences (cf. Simmons, Burgeson, Carlton-Ford, & Blyth, 1987; Vanlede, Little, & Card, 2006; Simon et al., 2009). For example, Simmons and colleagues have suggested that it is the cumulative influence of major developmental changes (e.g., changing schools, dating, puberty, family changes) which occur during early adolescence that accounts for the increased anxiety (and other problems) often found in this age group (cf. Simmons et al., 1987). These researchers refer to an “arena of comfort” for coping with life change and note that: “If change comes too suddenly – that is, if there is too much discontinuity with prior experience – or if change is too early given children’s cognitive and emotional states, or if it occurs in too many areas of life at once, then individuals may experience considerable discomfort” (Simmons et al., 1987, p. 1231).

Consistent with this notion, several studies have noted even more pronounced difficulties for youth who transition from elementary school at an earlier age (e.g., Grade 6 or 7 compared with Grade 8 or 9; Blyth et al., 1983; Simmons & Blyth, 1987; Simmons et al., 1979), when greater life changes are likely to be occurring. Furthermore, among these younger adolescents, the type of school (middle school versus junior high) and grade (i.e., 5–6th versus 6–7th) change appears less important than the actual transition itself. For example, Harter et al. (1992) found differing relations with scholastic anxiety among those who changed grades and schools, compared with those who remained in the same school and changed grades. For those who changed schools, scholastic anxiety was negatively

associated with academic competence and intrinsic motivation, regardless of the grade transition (i.e., 5–6 or 6–7). In combination, these studies suggest that a school transition which occurs earlier in adolescence may be particularly difficult because it may be one of many major life changes/stressors (e.g., puberty, greater family independence, or increased responsibilities) occurring during that time. Thus, anxiety difficulties may be particularly pronounced in youth who are transitioned to a new school during this early adolescent period (Grades 5–7/approximately ages 10–12).

Although the transition to a new school can be difficult for early adolescents, the majority of children adjust without significant impairment. Therefore, it seems that additional factors may influence the manner in which youth adjust to this major life change. The framework for this paper draws from the field of developmental psychopathology. Implicit within the definition of developmental psychopathology is the concern with developmental deviations or distortions (i.e., clinical psychopathologies such as anxiety) that occur throughout and across the life span, as well as the processes associated with those digressions. The study of psychopathology, from this perspective, is organized around milestones, transitions, and sequences in physical, cognitive, and social–emotional development. Because both healthy and pathological development can result from individually distinct and unique transactions between a changing organism and its environmental context (i.e., equifinality), it is important to identify factors which promote or inhibit early deviations or maintain or disrupt early adaptation and development (Ollendick, Grills, & King, 2001). The current study applies this perspective to the examination of anxiety across an important developmental period (early adolescence) and environmental change (school transition). In addition, this study aims to identify potential protective (resiliency, cf. Fonagy, Steele, Steele, Higgitt, & Target, 1994; Rutter, 1985) factors which may inhibit the development of anxious symptoms during this developmental period. In particular, self-worth, self-perceived social acceptance, and self-perceived social support are all variables which may influence the onset and/or maintenance of anxiety symptoms in adolescents.

Although various definitions of self-worth or self-esteem have been put forth, Harter (1988) conceptualizes global self-worth as, “a global judgment of one’s worth as a person, rather than domain-specific competence or adequacy” (p. 3) and includes such aspects as the extent one likes oneself as a person and is happy with oneself. In general, self-worth has been well-linked to internalizing problems in youth. For example, higher levels of self-worth have been purported as a protective factor against the development of youth anxiety (Compas, 1987; Davey, Eaker, & Walters, 2003; LaGreca & Fetter, 1995; Ollendick, 1983). Unfortunately, self-worth has also been found to decrease at approximately the time when children enter junior high school (Wigfield, Eccles, MacIver, & Reuman, 1991). Thus, for young adolescents who show decrements in self-worth, anxiety symptoms may be more likely to occur. In contrast, maintained or improved self-worth may serve a protective role against the development of anxiety despite such stresses as transitioning to a new school.

Supportive relationships have also been enlisted as potential risk or protective factors regarding the development of youth internalizing symptomatology in the face of life stressors (DuBois, Felner, Brand, Adan, & Evans, 1992; Farrell et al., 2006; LaGreca & Fetter, 1995; Renouf, Kovacs, & Mukerji, 1997; Starr & Davila, 2008). Since children’s peer relationships take on greater significance with age (Kingery & Erdley, 2007; Simmons et al., 1979), peer interactions may be particularly relevant for early adolescents’ adjustment. For example, better adjustment (i.e., measures of neurotic and antisocial behaviors) has been found for adolescents reporting a better network of friends and transitioning between Grades 5–6 (Kingery & Erdley, 2007) and 6–7 (Pellegrini, 1994). Furthermore, significant associations have been noted for adolescent anxiety symptoms and various peer relationship variables, such as poor social competence (Bosquet & Egeland, 2006; Smári, Pétursdóttir, &

Porsteinsdóttir, 2001; Spence, Donovan, & Brechman-Toussaint, 1999), low social acceptance (Inderbitzen, Walters, & Bukowski, 1997; LaGreca & Lopez, 1998), peer rejection/neglect (Inderbitzen et al., 1997; LaGreca, Dandes, Wick, Shaw, & Stone, 1988; LaGreca & Stone, 1993), and peer support (Last, 1989; Ohannessian, Lerner, Lerner, & von Eye, 1994).

Adolescent anxiety has also been associated with support from parents (Zimmerman, Ramirez-Valles, Zapert, & Maton, 2000), various aspects of family characteristics (e.g., low cohesion, high conflict; Burt, Cohen, & Bjorck, 1988), and parent–child relationships (e.g., insecure attachments, Papini & Roggman, 1992). For example, Zimmerman et al. (2000) found adolescents who reported greater parent support to be less anxious over a six-month period. Similarly, research has found lower anxiety among adolescents who reported closer relationships with their parents regardless of autonomy levels (i.e., individuated and connected parent–child relationships), as compared with those who reported low closeness with parents and high autonomy (i.e., detached relationships; Delaney, 1996). Drawing from the attachment literature (cf. Bowlby, 1982), it is presumed that children who have secure attachments with their parents believe in the availability and support of their parents. These factors, in turn, are assumed to assist children through stressful life events and protect them from anxiety (e.g., Papini, Roggman, & Anderson, 1991). Consistent with this notion, Papini and Roggman (1992) found better adjustment (i.e., fewer social and physical anxiety symptoms) to the junior high transition among adolescents who reported having more positive attachment relationships. Similarly, Schneider, Tomada, Normand, Tonci, and de Domini (2008) found better academic adjustment among those with greater parent support in an adolescent sample of Italian youth making the transition to the equivalent of middle school.

Although less studied, research also appears to suggest that teacher support can play an important role for early adolescents. For example, Eccles and colleagues reported that adolescents' relationships with middle/junior high school teachers are often worse than those with elementary school teachers. In addition, they found that adolescent perceived changes in teacher supportiveness were positively related to academic value; such that, students who perceived their middle school mathematics teachers as less supportive than their previous teachers were also more likely to report math to be less valuable (e.g., interesting) for themselves (cf. Midgley, Feldlaufer, & Eccles, 1989). Other researchers have also reported a potential protective role for teacher support (e.g., DuBois et al., 1992; DuBow & Tisak, 1989; Parker, 2009; Resnick et al., 1997; Rowlison & Felner, 1988). For example, DuBois et al. (1992) found student perceived school support (i.e., from teachers and other school personnel) to significantly predict later psychological distress (i.e., a composite variable of depression, anxiety, and self-appraisal inventories). Specifically, for adolescents who reported perceiving greater initial support at school, reduced distress was reported two years later.

Gender represents an additional factor associated with increased risk of anxiety during adolescence. While similar rates of anxiety problems are reported for young girls and boys, a disproportionate number of girls begin reporting anxiety symptoms in early adolescence (cf. Bosquet & Egeland, 2006; Costello, Egger, & Angold, 2005; Craske, 2003; Ohannessian, Lerner, von Eye, & Lerner, 1996). Researchers have offered various explanations as to why these gender differences emerge, including differences in adolescent male/female body image (Allgood-Merten, Lewinsohn, & Hops, 1990), coping strategies (Compas, Orosan, & Grant, 1993), parental acceptance (Ohannessian et al., 1996), self-competencies (Ohannessian et al., 1999), and self-esteem (Blyth et al., 1983, Simmons et al., 1979). It may also be that gender moderates the relation between risk factors such as these and anxiety. For instance, Ohannessian et al. (1999) found that gender differences in trait

anxiety were preceded by those for specific aspects of self-appraisal (global self-worth, physical appearance, and athletic competence). Further, with the variance of these self-appraisals accounted for, the relationship between gender and anxiety weakened. Thus, it may be that gender interacts with other important variables (e.g., self-appraisals/perceptions) to result in the differential anxiety levels commonly reported by young adolescents, rather than simply a change in the levels of anxiety experienced by males and females per se. Nonetheless, little research has examined the impact of variables such as these on the gender distribution changes that occur in anxiety symptoms during the middle school years, and the literature that does exist is derived primarily from cross-sectional research, thus limiting the predictive findings (Ohannessian et al., 1999). Moreover, research to date has generally focused on a general anxiety variable or only one aspect of anxiety (e.g., OCD or social anxiety); however, it may be that different symptoms or subtypes of anxiety are impacted. Thus, the present study explores several areas (i.e., social anxiety, separation anxiety, physical symptoms of anxiety, and harm avoidance – see below for detailed descriptions) to determine whether findings remain consistent or diverge across these various anxiety symptoms.

The current study sought to address gaps in the extant literature through examination of age and grade-related changes in specific aspects of anxiety using longitudinal data. This study also expanded on previous research by examining the roles of global self-worth, self-perceived social competence, and self-perceived social support on changes in anxiety during the early adolescent years. The impact of these factors was assessed following the transition to middle school (T1; sixth grade) and again two years later (T2; eighth grade). It was hypothesized that anxiety would be greater in the transitional sixth grade year (vs. eighth grade) and greater for girls (vs. boys) in both grades. Self-worth and self-perceptions of social competence and social support were also hypothesized to predict unique variance in eighth grade anxiety beyond that predicted by sixth-grade anxiety. Finally, the moderating influence of gender was examined to determine whether the relationship between these factors and changes in anxiety would be different for girls and boys. In particular, given differences in social relationships and anxiety, weaker relations were expected to be found on the anxiety symptom outcome variables for girls with positive perceptions of their social support and social acceptance. High global self-worth, however, was expected to serve a protective role against anxiety for *both* boys and girls as they progressed across the middle school years.

Method

Participants

Participants were students enrolled in a southwestern Virginia middle school in Grade 6 (T1; transition year, age range=11–13) and Grade 8 (T2, age range=11–15). Parent, child, and school consent to participate in the study was obtained for all children prior to completion of measures. The initial study wave was conducted as part of a school-wide initiative to examine peer relationships and socioemotional symptoms. All 280 children granted assent at T1 and were included in the study. For the follow-up portion of the study conducted two years later, parents were required to provide written consent for their children to participate. In all, three mailings were completed and 33% (91) of the parent forms were returned granting consent for their child's participation. All children present on the day of testing (89) gave assent with 12 of those representing new students with only T2 data. Thus, the current study includes only those 77 children for whom complete T1 and T2 data were obtained.

For these 77 youth, the mean age at T1 (the year they transitioned to a new school for Grade 6) was 11.69 (SD=.52) and at T2 (two years later in the highest grade at that school) was 13.64 (SD=.54). Sex distribution was approximately equal (52% female), and the majority

(88%) of participants were Caucasian (88%, 4% African-American, 4% Native American/Alaskan Native, 3% Bi-Racial, and 1% Asian-American). Although socioeconomic data were not collected on individual participants, census track data indicated that these children resided primarily in lower middle to upper middle-income families. Differences between students who completed only T1 data and those who completed both assessment points were examined with Bonferroni corrected ($p < .005$) chi-square analyses and one-way analyses of variance. No significant differences were found on any of the demographic (age, gender, and race) or primary (anxiety, social support, self-worth, and social acceptance) variables of interest for the study.

Measures

Multidimensional Anxiety Scale for Children (MASC)—The Multidimensional Anxiety Scale for Children (MASC) is a 39-item self-report measure designed for use with children and adolescents aged 8–19 (March, 1997). For each item, the child is asked to record their response on a four-point Likert scale (0–3). The MASC provides a total score and four subscales, three of which are comprised of two subfactors: (1) Physical Symptoms (tense/restlessness and somatic/autonomic); (2) Harm Avoidance (anxious coping and perfectionism); (3) Social Anxiety (humiliation/rejection and performing in public fears); and (4) and Separation Anxiety. Satisfactory to excellent internal reliability and test-retest reliability coefficients have been reported for all domains of the MASC (March, 1997; March, Parker, Sullivan, Stallings, & Conners, 1997; March, Sullivan, & Parker, 1999; Olason, Sighvatsson, & Smari, 2004). Convergent and divergent validity has also been demonstrated (Grills & Ollendick, 2002b; March et al., 1997; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002). Acceptable internal consistency was found for the MASC at both study waves of the current study for the overall MASC (αs = .84–.89) and subscales (αs = .64–.80).

Self-perception Profile for Children (SPPC)—The Self-perception Profile for Children (SPPC; Harter, 1985) is a 36-item scale designed to assess children's self-perceptions across a variety of domains. Each item contains two antithetical statements (e.g., "Some kids like the kind of person they are BUT other kids wish that they were different") that are selected between and then rated as really true or sort-of-true. Although this scale provides a score for six subscales, only the global self-worth and social acceptance subscales were utilized in the present study. Each of these subscales contains six items with half of the items reverse worded. Total scores are divided by six, resulting in subscale mean item scores ranging from one to four, with higher scores reflecting more positive feelings of self-worth or perceptions of social acceptance/popularity. Normative and psychometric data for this scale are available for children in Grades 3–8. Acceptable internal consistency has been reported for both subscales (Harter, 1985) and was also found in the current study (social acceptance – T1 α = .75, T2 α = .81; global self-worth – T1 α = .81, T2 α = .83).

Social Support Scale for Children (SSSC)—This questionnaire consists of 24 antithetical statements (e.g., "Some kids have a close friend who they can tell problems to BUT other kids don't have a close friend who they can tell problems to") that children choose and rate as really true or sort-of-true for themselves. This scale yields four subscales corresponding to individuals from whom support is received, including parents, classmates, teachers, and close friends. Similar to the scoring of the SPPC, each subscale item mean is calculated and ranges from one to four with higher scores representing higher perceptions of support. Acceptable internal reliability has been demonstrated for each of these subscales among children in Grades 3–8 (Harter, 1986) and was found for the current study as well (T1 α = .73–.85; T2 α = .70–.85).

Procedure

This study was conducted in compliance with the Virginia Tech Institutional Review Board. School and administrative consent (e.g., superintendent's office) was granted for the present study to be conducted. Time 1 data were collected as part of a grade-wide project on peer relationships. Follow-up (Time 2) data were collected approximately two years later. For Time 2 recruitment, a letter from the school principal detailing the project, the parent consent form, and child assent form were mailed to all eighth grade students' parents with their report cards. Parents were asked to review and sign the consent form and return it to the school. Subsequent mailings with additional copies of these materials were sent to parents who did not return the consent form. Children completed all measures in small groups under the supervision and guidance of a doctoral level graduate student within their classrooms (Grade 6) or the school auditorium (Grade 8). Counterbalancing was used in the presentation of the questionnaires to prevent order effects and all children included in this study were assessed within the same school week in order to control for extraneous factors as much as possible. There were no incentives or rewards given to parents or their children for participation in this study. Prior to conducting analyses, missing data points were imputed if less than one-third of a scale or subscale was found to be incomplete. For those cases where imputation occurred, the modal value for endorsed items was used to replace missing values. Scales or subscales with more than one-third of the items missing were removed.

A balance was needed in protecting alpha from inflation and spurious relationships while also being able to identify important effects. Consequently, for all MANOVA and Multiple Regression analyses, omnibus effects were only interpreted if alpha reached a Bonferroni-corrected critical p of .01 (.05/5 primary analyses). In the event of a significant ($p < .01$) omnibus effect, univariate effects were interpreted at the $p < .05$ level. For the primary ANOVA, power analysis using the G*Power software (version 3.1.0; Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007) indicated that the model was sufficiently powered ($1 - \beta = .80$) to detect a medium sized interaction effect ($f^2 = .16$; see Cohen, 1992), while the subsequent regression analyses were sufficiently powered to detect small to medium effects in the first step ($f^2 = .10$) and medium effects in the second ($f^2 = .21$) and final ($f^2 = .20$) steps. Two of the variables, the Friend Support and Parent Support subscales from the Social Support Scale for Children (SSSC), were significantly positively skewed (−1.43 and −1.90, respectively). Transformations normalized the distributions and the transformed variables were subsequently utilized in analyses.

Results

Preliminary analyses

Although gender effects were hypothesized for the primary analyses, we tested for potential gender differences on the main outcome variables. Univariate gender differences were observed only for perceived global self-worth in the sixth grade, $r\ (75) = -.295$, $p = .01$, and separation anxiety in the eighth grade, $r\ (76) = -.303$, $p = .01$. In both instances, girls reported higher levels than boys. No other variables were significantly related to gender. A full table of correlations among study variables is presented in Table 1.

Grade and gender differences in anxiety symptoms

To examine the hypotheses that anxiety would be greater in the transitional sixth grade year (vs. eighth grade) and greater for girls (vs. boys) in both grades, the data were subjected to repeated measures ANOVA. T1 and T2 MASC Subscale Scores were entered as repeated measures factors while gender was included as a between-subjects factor. Results indicated significant multivariate main effects of time [$F\ (4, 72) = 4.63$, $p < .01$, partial $\eta^2 = .205$] and

gender [F (1, 75) = 3.50, p = .01, partial η^2 = .163]. Anxiety was significantly higher at T1 than T2, and higher for girls than boys in both grades.

Univariate follow-up analyses indicated that the main effect for time was primarily driven by differences on the MASC Harm Avoidance [F (1, 75) = 12.98, p < .01, partial η^2 = .148] and Separation Anxiety [F (1, 75) = 11.15, p < .01, partial η^2 = .129] subscales. On both scales, T1 scores were higher than T2 scores (see Table 2). The significant main effect of gender was only observed at the univariate level on the Separation Anxiety scale [F (1, 75) = 13.31, p < .01 partial η^2 = .151], wherein girls (M = 7.29, SE = .54) scored significantly higher than boys (M = 4.47, SE = .56).

Both multivariate main effects were modified by a significant time by gender interaction, F (4, 72) = 4.11, p < .01, partial η^2 = .186. The nature of the interaction was such that for boys, a significant decrease was observed from sixth to eighth grade, while no significant decrease was observed for girls. Univariate follow-up analyses indicated that the multivariate interaction effect was largely driven by a univariate interaction effect with the MASC Social Anxiety subscale, F (1, 75) = 8.93, p < .01, partial η^2 = .106. The pattern of the univariate interaction was similar to that described above, with girls showing no significant change in social anxiety from sixth to eighth grade [F (1, 39) = 1.59, p = .22, partial η^2 = .039], while boys showed a significant decrease in social anxiety from sixth to eighth grade [F (1, 36) = 10.00, p < .01, partial η^2 = .217; see Table 2 and Figure 1].

Predictors of anxiety in Grade 8

The data were then analyzed to test the second hypothesis, that self-worth, self-perceived social acceptance, and perceived social support would uniquely predict variance in T2 anxiety, above and beyond that predicted by T1 anxiety, while gender would act as a moderator of these effects. This hypothesis was tested using a series of hierarchical regressions, with a T1 MASC Subscale Score entered in the first step to predict the corresponding T2 MASC Subscale Score. In the second step, the social support, social acceptance, self-worth, and gender variables were entered. All variables were centered, and multiplied with an effect coded gender variable to create interaction terms, which were entered on the third step (see Table 3).

In the first step of each regression, each T1 Subscale Score significantly predicted its corresponding T2 Subscale Score. Neither the second step, entering global self-worth, social acceptance, support scales, and gender, nor the third step of entering in gender interaction terms, significantly improved the prediction of T2 Physical Symptoms of Anxiety (Step 2: $R^2\Delta$ = .144, R^2 = .295, $F\Delta$ = 1.96, p = .07; Step 3: $R^2\Delta$ = .013, R^2 = .308, $F\Delta$ = .20, p = .98), T2 Harm Avoidance (Step 2: $R^2\Delta$ = .103, R^2 = .452, $F\Delta$ = 1.01, p = .10; Step 3: $R^2\Delta$ = .077, R^2 = .543, $F\Delta$ = 2.02, p = .07), or T2 Separation Anxiety (Step 2: $R^2\Delta$ = .058, R^2 = .346, $F\Delta$ = .85, p = .55; Step 3: $R^2\Delta$ = .014, R^2 = .360, $F\Delta$ = .23, p = .97) after accounting for the respective T1 scores. However, for T2 Social Anxiety, the second step improved the prediction beyond T1 Social Anxiety ($R^2\Delta$ = .188, R^2 = .476, $F\Delta$ = 3.43, p < .01), with global self-worth (β = −.34, p<.01), social acceptance (β = −.30, p = .02), and gender (β = −.29, p < .01), making significant and unique contributions. The nature of the relationships between change in Social Anxiety and both self-worth and social acceptance was such that higher scores on each measure were associated with decreases in Social Anxiety from T1 to T2. The gender effect was such that boys showed greater decreases from T1 to T2 than did girls. Entry of the third step gender interaction variables, however, did not improve the equation ($R^2\Delta$ = .030, R^2 = .506, $F\Delta$ = .62, p = .72).

Discussion

The present study was conducted to examine developmental changes in the anxiety symptoms of early adolescents, as well as to explore potential variables that might impact these changes. As predicted, students, overall, reported greater anxious symptomatology in the transitional sixth grade year. By the eighth grade, the overall rates of anxiety had decreased significantly for students as a whole. Consistent with previous findings (e.g., Blyth et al., 1983; Harter et al., 1992), the transitional sixth grade year appeared to be a particularly salient time for students to report elevated levels of anxiety; perhaps due to the stressors involved in moving into a new school (Greene & Ollendick, 1993). For example, in the school district in which this study was conducted, youth from at least five different elementary schools merge into the same middle school and begin rotating classrooms and teachers for each subject (compared with staying within the same classroom and the same teacher for most subjects in the elementary schools). Thus, students are faced with the challenges of managing new friendships and peer groups, navigating a new school and a different class schedule, and receiving more difficult schoolwork. In addition, the transition to sixth grade marks the change from being the oldest students in the (elementary) school to the youngest in the (middle) school. Given the exceptionally high rates of bullying found in schools around the country (Grills & Ollendick, 2002a; Nansel, Overpeck, & Pilla, 2001; Perry, Kusel, & Perry, 1988), this may also contribute to increased worry and anxiety evidenced by students in entry grades (e.g., a sixth grade student in a middle school comprised of 6–8th grades). Furthermore, all of these changes were occurring in combination with other normative developmental changes that could be perceived as stressful by youth (e.g., puberty, increased autonomy/responsibilities, etc.). Therefore, in line with what has been previously suggested (e.g., Eccles et al., 1993; Simmons et al., 1987), the combination of these stressors is likely reflected in the increased reports of anxious symptoms found in these sixth grade students.

Interestingly, when the four main subscales of the MASC were explored individually, significant overall changes from sixth to eighth grade were only noted for the Harm Avoidance and Separation Anxiety scales. In each of these cases, both boys and girls reported significantly fewer symptoms in Grade 8. In reference to separation anxiety, since early adolescence is often a time of increased autonomy from parents and time spent associating with peers, it is not surprising that decrements in this type of anxiety were found. In addition, prior research has established that separation anxiety typically occurs in children of younger ages (e.g., American Psychiatric Association [APA], 2000, p. 123; Cohen, Cohen, Kasen, & Velez, 1993; Compton, Nelson, & March, 2000; Kessler et al., 2005). Thus, the decrease in these symptoms likely reflects developmentally appropriate changes in youth progressing from late childhood to early adolescence. As noted, a significant decrease was also found for the Harm Avoidance scale of the MASC. Inspection of mean scores for the two areas that comprise Harm Avoidance revealed similar decreasing trends for students from sixth to eighth grade. That is, overall ratings for both perfectionistic (e.g., “I try to do everything exactly right”) and anxious coping (e.g., “I stay away from things that upset me”) symptoms were lower among the youth during their eighth grade year. This finding may have occurred due to the increased maturity of the sample, especially since several of the harm avoidance items may be interpreted as childish or characteristic of a weak and ineffectual individual (e.g., asking permission, letting someone know right away when scared/upset). In contrast, for the sample as a whole, Social Anxiety and Physical Symptoms of Anxiety did not change over time. Still, a closer examination of the interaction effects and the mean scores for boys and girls revealed remarkable gender differences with boys reporting decreased and girls stable social anxiety from sixth to eighth grades – a finding further discussed below.

A significant effect was also found for gender, such that boys tended to report less overall anxiety than girls (across both assessments), a finding consistent with previous research in this age range (cf. Bosquet & Egeland, 2006; Costello et al., 2005; Craske, 2003; Ohannessian et al., 1996; Ollendick, 1983). Interestingly, when the MASC subtests were explored individually, only Separation Anxiety remained significant. That is, averaged across assessments, boys and girls typically reported similar levels of social anxiety, harm avoidance, and physical anxiety symptoms. However, in almost all instances, boys scored lower than girls, thus leading to the overall gender effect found. Nonetheless, girls' scores were consistently higher on separation anxiety symptoms, such as being fearful of being away from parents, being alone, and/or having specific fears (i.e., dark, transportation, animals). This finding is consistent with documented gender differences in separation anxiety among survey samples (APA, 2000, p. 123; Compton et al., 2000) similar to the current study. As previously noted, middle school is often a time of increased independence-seeking among youth. However, social expectations also often differ for boys and girls, with girls being less reinforced for such independence-seeking behaviors and more likely to disclose dependent traits (e.g., Bornstein, 1992; Bornstein, Manning, Krukonis, & Rossner, 1993; Gilligan, 1982; Denmark, Rabinowitz, & Sechzer, 2000). That is, boys typically receive greater encouragement for demonstrating autonomy from parents and "toughness," whereas it is more acceptable for girls to remain dependent and to disclose fearful behaviors. Consistent with this, researchers have generally found women to report greater dependency characteristics (cf. Bornstein et al., 1993), as well as more interdependent attributes (compared with more independent attributes reported by men; cf. Guimond, Chatard, Martinot, Crisp, & Redersdorff, 2006).

Finally, a significant time-by-gender interaction was found in the present study. Consistent with the findings of Ohannessian et al. (1999), there were no significant differences for boys' and girls' overall anxiety levels in Grade 6, suggesting that such gender differences had not yet emerged at that point in time. However, by the eighth grade, boys' overall anxiety levels had significantly decreased while girls' had not (see Figure 1). These findings are not unexpected given the extant literature indicating that a shift from gender equivalent anxiety rates to greater rates among females occurs in the early adolescent years (cf. Bosquet & Egeland, 2006; Costello et al., 2005; Craske, 2003; Ohannessian et al., 1996). Remarkably, examination of the individual MASC subscales revealed that this interaction was driven almost exclusively by distinctions in social anxiety symptoms. That is, while girls evidenced a non-significant change in reports of social anxiety from Grades 6 to 8, boys evidenced a significant reduction in the number of these symptoms reported. This differential pattern of results for social anxiety is intriguing, as it suggests that the transitional year may spark increased social concerns for boys that later dissipate. In contrast, for girls, social concerns appeared to stay consistent over this time period. It may be that boys become more adjusted to the new setting and/or are exposed to fewer social stressors during middle school, thus accounting for these differences. For example, adolescent girls often engage in greater relational forms of bullying (e.g., spreading rumors, gossiping; Crick & Grotpeter, 1995; Mynard & Joseph, 2000; Olweus, 1991) and tend to place greater emotional investment in peer status and friendships (Lagerspetz, Bjoerkqvist, & Peltonen, 1988), both of which may be related to greater concern for friendships and continued social anxiety symptoms.

In the second series of analyses conducted, several variables proposed to influence change (protective role) in anxiety over the middle school years, as well as the moderating role of gender, were examined. However, main effects were only found for Social Anxiety, with both global self-worth and self-perceived social acceptance serving as predictors. Thus, for boys and girls, positive feelings about the self and perceived acceptance from one's peer group significantly predicted decreases in eighth grade social anxiety symptoms. This

finding is consistent with previous research delineating the importance of positive perceptions of the self and among one's peers for resiliency against the many stressors of adolescence (e.g., Davey et al., 2003; Dumont & Provost, 1999; Kingery & Erdley, 2007). While the former (global self-worth) predictor was expected given past research specifically linking high self-worth as a protective factor against anxiety symptoms (Compas, 1987; LaGreca & Fetter, 1995; Ollendick, 1983), the latter (perceived social acceptance) also appears to highlight the importance of a sense of belonging. Remarkably, these results were only significant regarding prediction of socially anxious symptoms and suggest that other aspects of anxiety are better explained by alternative factors.

While the above effects are notable, the overall lack of other main effects and interactions was somewhat unexpected. That is, perceived support from parents, classmates, friends, and teachers were unrelated to changes in the anxiety indices included in this study. The lack of effects for classmates and friends contrasts with data from Pellegrini (1994) who reported that adolescents transitioning between sixth and seventh grades that had better peer relationships showed better psychosocial adjustment. Explanations for this discrepancy are less evident, but may relate to the collinearity among the different predictors used in the studies. Pellegrini (1994), for example, assessed peer group size directly and did not include indices of social acceptance. We, on the other hand, measured perceived support from friends and classmates, as well as self-perceived social acceptance. Thus, while it may be that social support/peer group size is an important determinant of adjustment, one's own perception of his or her acceptance by others may hold even greater predictive power, thereby washing out any unique impact of social support from our results. Also in contrast to predictions, results of the current study failed to demonstrate a significant role for adolescents' perceived parental support. Nonetheless, this finding is similar to that found by Burt et al. (1988) and consistent with findings of increased autonomy and friendship importance beginning in the adolescent years. Finally, it was predicted that teacher support would influence anxiety based on previouswork demonstrating the role of this variable on other domains of adolescents' lives (e.g., DuBois et al., 1992; Midgley et al., 1989); however, these findings were not corroborated by the current study.

In summary, there appear to be changes in the types of anxious symptoms experienced by girls and boys of middle school age with relatively universal decreases in areas such as separation concerns and harm avoidance and increased differences emerging, particularly in the area of girls' social concerns. Unfortunately, with only the two assessment points it cannot be determined whether these patterns continued into the high school years or if another marked change occurred as these adolescents transitioned into yet another school. It is also unclear if the anxiety reported in sixth grade reflected a significant change from previous years. Clearly, it will be important for these limitations to be addressed in future studies. Furthermore, while others have reported that, once present, anxiety symptoms often persist (Bosquet & Egeland, 2006; Gullone, King, & Ollendick, 2001; Ollendick & King, 1994; Verhulst & Van der Ende, 1992), the present findings suggest that there may be particular peak periods for these symptoms in youth and that other aspects of youth experiences may serve as protective factors against the development of more significant and persistent anxiety problems.

Importantly, a number of clinical implications can be derived from the findings of this study. The current findings add to extant literature demonstrating that early adolescence can be a particularly difficult time for youth and perhaps a time when support activities could be implemented in schools to help prevent increases in anxiety and decreases in other areas of self-perceptions. In addition, our findings that, as a whole, students reported greater anxiety during their transitional school year are consistent with those previously noted (e.g., Harter et al., 1992). Taken together, these findings suggest that consideration should be given to the

timing of school transitions. For instance, Harter et al.'s (1992) research revealed difficulty for early adolescents transitioning in either fifth or sixth grades. Given these findings and the numerous changes occurring for early adolescents, it may be beneficial to consider alternate ages for such transitions. However, this would require major policy and organizational changes that are probably unfeasible for most school districts. Furthermore, additional research on psychosocial adjustment would be necessary to determine if older or younger transition ages proved less difficult on adolescents. Therefore, school-based interventions targeting anxiety reduction, particularly regarding social anxiety concerns, as well as self-worth building strategies should be examined as these could indeed prove beneficial for pre-adolescents. If strategies such as these were introduced in elementary school, prior to the numerous changes which occur in early adolescence and major school transitions, it may be that psychosocial difficulties would be lessened when school transitions occurred. This appears particularly pertinent for early adolescent females who showed relative stability in anxiety symptoms over the middle school years. Moreover, the differential findings among these students further speak to the importance of examining gender differences when conducting researcher concerning adolescent development and changes.

Finally, it is valuable to note limitations of the present study as well as some future directions for research. First, the present study relied solely upon the use of self-report measures. Although self-report measures of internalizing symptoms appear to be less problematic (Craig, 1998), sole reliance on self-report measures allows for the confounding of shared method variance. Thus, it would be useful for future research to include the reports of others (e.g., classmates, teachers, parents), which may be more objective and allow for multiple informant comparisons (Ollendick & Hersen, 1993). Second, the present sample was limited in that the majority of children were Caucasian and all children were drawn from the same school in a small suburban town. Therefore, the findings may not generalize to more diverse ethnic populations, regional settings, or developmental periods. Sample size may have also affected our results, such that power to detect study differences may have been limited. That is, when separated by gender, the small sample sizes likely influenced the significance levels and may have reduced the chances of detecting important relations. Thus, these moderator models should be further examined in future research, perhaps with greater initial sample sizes that could still produce acceptable power, even with attrition. Future studies should attempt to address these limitations, as well as utilize a three-point longitudinal design in explicating the relationships among the variables examined.

References

Allgood-Merten B, Lewinsohn P, Hops H. Sex differences and adolescent depression. Journal of Abnormal Psychology 1990;99:55–63. [PubMed: 2307767]

American Psychiatric Association [APA]. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: Allen Frances; 2000. text revision

Beidel DC. Social phobia and overanxious disorder in school-age children. Journal of the American Academy of Child and Adolescent Psychiatry 1991;30:545–552. [PubMed: 1890086]

Blyth D, Simmons R, Carlton-Ford S. The adjustment of early adolescents to school transitions. Journal of Early Adolescence 1983;3:105–120.

Bornstein R. The dependent personality: Developmental, social, and clinical perspectives. Psychological Bulletin 1992;112:3–23. [PubMed: 1529038]

Bornstein R, Manning K, Krukonis A, Rossner S. Sex differences in dependency: A comparison of objective and projective measures. Journal of Personality Assessment 1993;61:169–181. [PubMed: 8377101]

Bosquet M, Egeland B. The development and maintenance of anxiety symptoms from infancy through adolescence in a longitudinal sample. Development and Psychopathology 2006;18:517–550. [PubMed: 16600066]

Bowlby, J. Attachment (Vol. 1 of Attachment and Loss). New York, NY: Basic Books; 1982.

Burt C, Cohen L, Bjorck J. Perceived family environment as a moderator of young adolescents' life stress adjustment. American Journal of Community Psychology 1988;16:101–122. [PubMed: 3369377]

Cantwell D, Baker L. Stability and natural history of DSM-III childhood diagnoses. Journal of the American Academy of Child and Adolescent Psychiatry 1989;28:691–700. [PubMed: 2793796]

Cartwright-Hatton S, McNicol K, Doubleday E. Anxiety in a neglected population: Prevalence of anxiety disorders in pre-adolescent children. Clinical Psychology Review 2006;26:817–833. [PubMed: 16517038]

Clark D, Smith M, Neighbors B, Skerlec L. Anxiety disorders in adolescence: Characteristics, prevalence, and comorbidities. Clinical Psychology Review 1994;14:113–137.

Cohen J. A power primer. Psychological Bulletin 1992;112:155–159. [PubMed: 19565683]

Cohen P, Cohen J, Kasen S, Velez C. An epidemiological study of disorders in late childhood and adolescence: I. Age and gender-specific prevalence. Journal of Child Psychology and Psychiatry 1993;34:851–867. [PubMed: 8408371]

Compas B. Coping with stress during childhood and adolescence. Psychological Bulletin 1987;101:393–403. [PubMed: 3602247]

Compas BE, Orosan PG, Grant KE. Adolescent stress and coping: Implications for psychopathology during adolescence. Journal of Adolescence 1993;16:331–349. [PubMed: 8282901]

Compton S, Nelson A, March J. Social phobia and separation anxiety symptoms in community and clinical samples of children and adolescents. Journal of the American Academy of Child and Adolescent Psychiatry 2000;39:1040–1046. [PubMed: 10939233]

Costello E, Angold A, Burns BJ, Stangl DK, Tweed DL, Erkanli A, et al. The Great Smoky Mountains study of youth: Goals, design, methods, and the prevalence of DSM-III-R disorders. Archives of General Psychiatry 1996;53:1129–1136. [PubMed: 8956679]

Costello E, Egger H, Angold A. The developmental epidemiology of anxiety disorders: Phenomenology, prevalence, and comorbidity. Child and Adolescent Psychiatric Clinics of North America 2005;14:631–648. [PubMed: 16171696]

Costello EJ, Costello AJ, Edelbrock C, Burns BJ, Dulcan MK, Brent D, et al. Psychiatric disorders in pediatric primary care: Prevalence and risk factors. Archives of General Psychiatry 1988;45:1107–1116. [PubMed: 3264146]

Craig WM. The relationship among bullying, victimization, depression, anxiety, and aggression in elementary school children. Personality and Individual Differences 1998;24:123–130.

Craske, MG. Origins of phobias and anxiety disorders: Why more women than men?. Oxford: Elsevier; 2003.

Crick NR, Grotpeter JK. Relational aggression, gender, and social-psychological adjustment. Child Development 1995;66:710–722. [PubMed: 7789197]

Davey M, Eaker DG, Walters LH. Resilience processes in adolescents: Personality profiles, self-worth, and coping. Journal of Adolescent Research 2003;18:347–362.

Delaney M. Across the transition to adolescence: Qualities of parent/adolescent relationships and adjustment. Journal of Early Adolescence 1996;16:274–300.

Denmark, F.; Rabinowitz, V.; Sechzer, J. Engendering psychology: Bringing women into focus. Needham Heights, MA: Allyn and Bacon; 2000.

Dotterer A, McHale S, Crouter A. The development and correlates of academic interests from childhood through adolescence. Journal of Educational Psychology 2009;101:509–519.

DuBois DL, Felner RD, Brand S, Adan AM, Evans EG. A prospective study of life stress, social support, and adaptation in early adolescence. Child Development 1992;63:542–557. [PubMed: 1600821]

Dubow E, Tisak J. The relation between stressful life events and adjustment in elementary school children: The role of social support and social problem-solving skills. Child Development 1989;60:1412–1423. [PubMed: 2612250]

Dumont M, Provost MA. Resilience in adolescents: Protective role of social support, coping strategies, self-esteem, and social activities on experience of stress and depression. Journal of Youth and Adolescence 1999;28:343–363.

Ebata, A.; Petersen, A.; Conger, J. The development of psychopathology in adolescence. In: Rolf, JE.; Masten, AS.; Cicchetti, D.; Nuechterlein, KH.; Weintraub, S., editors. Risk and protective factors in the development of psychopathology. New York, NY: Cambridge University Press; 1990. p. 308-333.

Eccles, J.; Midgley, C.; Adler, T. Grade-related changes in the school environment: Effects on achievement motivation. In: Nicholls, JG., editor. The development of achievement motivation. Greenwich, CT: JAI Press; 1984. p. 283-331.

Eccles J, Midgley C, Wigfield A, Buchanan C. Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. American Psychologist 1993;48:90–101. [PubMed: 8442578]

Farrell A, Sullivan T, Kliewer W, Allison K, Erwin E, Meyer A, et al. Peer and school problems in the lives of urban adolescents: Frequency, difficulty, and relation to adjustment. Journal of School Psychology 2006;44:169–190.

Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. Behavior Research Methods 2009;41:1149–1160. [PubMed: 19897823]

Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods 2007;39:175–191. [PubMed: 17695343]

Fergusson D, Horwood L, Lynskey M. Prevalence and comorbidity of DSM-III-R diagnoses in a birth cohort of 15 year olds. Journal of the American Academy of Child and Adolescent Psychiatry 1993;32:1127–1134. [PubMed: 8282656]

Fonagy P, Steele M, Steele H, Higgitt A, Target M. The Emanuel Miller Memorial Lecture 1992: The theory and practice of resilience. Journal of Child Psychology and Psychiatry 1994;35:231–257. [PubMed: 8188797]

Gilligan, C. In a different voice: Psychological theory and women's development. Cambridge, MA: Harvard University Press; 1982.

Greene RW, Ollendick TH. Evaluation of a multimodal program for sixth graders in transition from elementary to middle school. Journal of Community Psychology 1993;21:162–176.

Grills AE, Ollendick TH. Peer victimization, global self-worth, and anxiety in middle school children. Journal of Clinical Child and Adolescent Psychology 2002a;31:59–68. [PubMed: 11845651]

Grills AE, Ollendick TH. Construct validity of the Multidimensional Anxiety Scale for Children in community and outpatient samples of children. Unpublished manuscript. 2002b

Guimond S, Chatard A, Martinot D, Crisp R, Redersdorff S. Social comparison, self-stereotyping, and gender differences in self-construals. Journal of Personality and Social Psychology 2006;90:221–242. [PubMed: 16536648]

Gullone E, King N, Ollendick T. Self-reported anxiety in children and adolescents: A three-year follow-up study. Journal of Genetic Psychology 2001;162:5–19. [PubMed: 11338440]

Hale W, Raaijmakers Q, Muris P, van Hoof A, Meeus W. Developmental trajectories of adolescent anxiety disorder symptoms: A 5-year prospective community study. Journal of the American Academy of Child & Adolescent Psychiatry 2008;47:556–564. [PubMed: 18356762]

Harter S. The perceived competence scale for children. Child Development 1982;5:87–97.

Harter, S. Manual for the self-perception profile for children. Denver, CO: University of Denver; 1985.

Harter, S. Manual for the social support scale for children. Denver, CO: University of Denver; 1986.

Harter, S. Manual for the self-perception profile for adolescents. Denver, CO: University of Denver; 1988.

Harter S, Whitesell N, Kowalski P. Individual differences in the effects of educational transitions on young adolescents' perceptions of competence and motivational orientation. American Educational Research Journal 1992;29:777–807.

Inderbitzen H, Walters K, Bukowski A. The role of social anxiety in adolescent peer relations: Differences among sociometric status groups and rejected subgroups. Journal of Clinical Child Psychology 1997;26:338–348. [PubMed: 9418172]

Kashani JH, Beck NC, Hoeper EW, Fallahi C, Corcoran CM, McAllister JA, et al. Psychiatric disorders in a community sample of adolescents. American Journal of Psychiatry 1987;144:584–589. [PubMed: 3495187]

Kashani JH, Orvaschel H. A community study of anxiety in children and adolescents. American Journal of Psychiatry 1990;147:313–318. [PubMed: 2309948]

Kessler R, Berglund P, Demler O, Jin R, Walters E. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry 2005;62:593–602. [PubMed: 15939837]

Kingery J, Erdley C. Peer experiences as predictors of adjustment across the middle school transition. Education and Treatment of Children 2007;30:73–88.

Kovacs M, Gatsonis C, Paulauskas S, Richards C. Depressive disorders in childhood: IV. A longitudinal study of comorbidity with and risk for anxiety disorders. Archives of General Psychiatry 1989;46:776–782. [PubMed: 2774847]

Lagerspetz K, Bjoerkqvist K, Peltonen T. Is indirect aggression typical of females? Gender differences in aggressiveness in 11 to 12-year-old children. Aggressive Behavior 1988;14:403–414.

LaGreca A, Lopez N. Social anxiety among adolescents: Linkages with peer relations and friendships. Journal of Abnormal Child Psychology 1998;26:83–94. [PubMed: 9634131]

LaGreca A, Stone W. Social anxiety scale for children – revised: Factor structure and concurrent validity. Journal of Clinical Child Psychology 1993;22:17–27.

LaGreca AM, Dandes SK, Wick P, Shaw K, Stone WL. Development of the social anxiety scale for children: Reliability and concurrent validity. Journal of Clinical Child Psychology 1988;17:84–91.

LaGreca, AM.; Fetter, MD. Peer relations. In: Eisen, AR.; Kearney, CA.; Schaefer, CE., editors. Clinical handbook of anxiety disorders in children and adolescents. Northvale, NJ: Jason Aronson; 1995. p. 82-130.

Last, C. Anxiety disorders. In: Ollendick, TH.; Hersen, M., editors. Handbook of child psychopathology. 2. New York, NY: Plenum Press; 1989. p. 219-227.

Last CG, Strauss CC, Francis G. Comorbidity among childhood anxiety disorders. Journal of Nervous Mental Disorders 1987;175:726–730.

March, J. Multidimensional anxiety scale for children. North Tonawanda, NY: Multi-Health Systems; 1997.

March JS, Parker JDA, Sullivan K, Stallings P, Conners CK. The multidimensional anxiety scale for children: Factor structure, reliability, and validity. Journal of the American Academy of Child and Adolescent Psychiatry 1997;36:554–565. [PubMed: 9100431]

March JS, Sullivan K, Parker JD. Test-retest reliability of the multidimensional anxiety scale for children (MASC). Journal of Anxiety Disorders 1999;13:349–358. [PubMed: 10504106]

McGee R, Feehan M, Williams S, Anderson J. DSM-III disorders from age 11 to 15 years. Journal of the American Academy of Child & Adolescent Psychiatry 1992;31:50–59. [PubMed: 1537781]

Midgley C, Feldlaufer H, Eccles J. Student/teacher relations and attitudes toward mathematics before and after the transition to junior high school. Child Development 1989;60:981–992. [PubMed: 2758891]

Mynard H, Joseph S. Development of the multidimensional peer-victimization scale. Aggressive Behavior 2000;26:169–178.

Nansel TR, Overpeck M, Pilla RS. Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. Journal of the American Medical Association 2001;285:2094–2100. [PubMed: 11311098]

Ohannessian C, Lerner R, Lerner J, von Eye A. A longitudinal study of perceived family adjustment and emotional adjustment in early adolescence. Journal of Early Adolescence 1994;14:371–390.

Ohannessian C, Lerner R, von Eye A, Lerner J. Direct and indirect relations between perceived parental acceptance, perceptions of the self, and emotional adjustment during early adolescence. Family and Consumer Sciences Research Journal 1996;25:159–183.

Ohannessian CM, Lerner RM, Lerner JV, von Eye A. Does self-competence predict gender differences in adolescent depression and anxiety? Journal of Adolescence 1999;22:397–411. [PubMed: 10462430]

Olason DT, Sighvatsson MB, Smari J. The psychometric properties of the multidimensional anxiety scale for children among Icelandic school children. Scandinavian Journal of Psychology 2004;45:429–436. [PubMed: 15535811]

Ollendick TH. Reliability and validity of the revised fear survey schedule for children (FSSCR). Behaviour Research and Therapy 1983;21:685–692. [PubMed: 6661153]

Ollendick, TH.; Hersen, M., editors. Handbook of child and adolescent assessment. Boston, MA: Allyn and Bacon; 1993.

Ollendick TH, King NJ. Assessment and treatment of internalizing problems: The role of longitudinal data. Journal of Consulting and Clinical Psychology 1994;62:918–927. [PubMed: 7806721]

Ollendick TH, Grills AE, King N. Applying developmental theory to the assessment and treatment of childhood disorders: Does it make a difference? Clinical Psychology and Psychotherapy 2001;8:304–314.

Olweus, D. Bully/victim problems among schoolchildren: Basic facts and effects of a school based intervention program. In: Pepler, D.; Rubin, K., editors. The development and treatment of childhood aggression. Hillsdale, NJ: Erlbaum; 1991. p. 411-448.

Papini D, Roggman L. Adolescent perceived attachment to parents in relation to competence, depression, and anxiety: A longitudinal study. Journal of Early Adolescence 1992;12:420–440.

Papini D, Roggman L, Anderson J. Early-adolescent perceptions of attachment to mother and father: A test of emotional-distancing and buffering hypotheses. Journal of Early Adolescence 1991;11:258–275.

Parker A. Elementary organizational structures and young adolescents' self-concept and classroom environment perceptions across the transition to middle school. Journal of Research in Childhood Education 2009;23:325–339.

Pellegrini A. A longitudinal study of school peer networks and adjustment to middle school. Educational Psychology 1994;14:403–412.

Perry DG, Kusel SJ, Perry LC. Victims of peer aggression. Developmental Psychology 1988;24:807–814.

Renouf AG, Kovacs M, Mukerji P. Relationship of depressive, conduct, and comorbid disorders and social functioning in childhood. Journal of the Academy of Child and Adolescent Psychiatry 1997;36:998–1004.

Resnick M, Bearman P, Blum R, Bauman K, Harris K, Jones J, et al. Protecting adolescents from harm: Findings from the national longitudinal study on adolescent health. Journal of the American Medical Association 1997;278(10):823–832. [PubMed: 9293990]

Rowlison R, Felner R. Major life events, hassles, and adaptation in adolescence: Confounding in the conceptualization and measurement of life stress and adjustment revisited. Journal of Personality and Social Psychology 1988;55:432–444. [PubMed: 3171915]

Rutter M. Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. British Journal of Psychiatry 1985;147:598–611. [PubMed: 3830321]

Schneider B, Tomada G, Normand S, Tonci E, de Domini P. Social support as a predictor of school bonding and academic motivation following the transition to Italian middle school. Journal of Social and Personal Relationships 2008;25:287–310.

Seligman, LD.; Ollendick, TH. Anxiety disorders. In: Steinhausen, HC.; Verhulst, F., editors. Risks and outcomes in developmental psychopathology. Oxford: Oxford University Press; 1999. p. 103-120.

Simmons, R.; Blyth, D. Moving into adolescence: The impact of pubertal change and school context. Hawthorne, NY: Aldine de Gruyter; 1987.

Simmons R, Burgeson R, Carlton-Ford S, Blyth D. The impact of cumulative change in early adolescence. Child Development 1987;58:1220–1234. [PubMed: 3665641]

Simmons RG, Blyth DA, Van Cleave EF, Bush DM. Entry into early adolescence: The impact of school structure, puberty, and early dating on self-esteem. American Sociological Review 1979;44:948–967. [PubMed: 543570]

Simon T, Ikeda R, Smith E, Reese L, Rabiner D, Miller S, et al. The ecological effects of universal and selective violence prevention programs for middle school students: A randomized trial. Journal of Consulting and Clinical Psychology 2009;77:526–542. [PubMed: 19485593]

Smári J, Pétursdóttir G, Porsteinsdóttir V. Social anxiety and depression in adolescents in relation to perceived competence and situational appraisal. Journal of Adolescence 2001;24:199–207. [PubMed: 11437480]

Spence S, Donovan C, Brechman-Toussaint M. Social skills, social outcomes, and cognitive features of childhood social phobia. Journal of Abnormal Psychology 1999;108:211–221. [PubMed: 10369031]

Starr L, Davila J. Differentiating interpersonal correlates of depressive symptoms and social anxiety in adolescence: Implications for models of comorbidity. Journal of Clinical Child and Adolescent Psychology 2008;37:337–349. [PubMed: 18470771]

Vanlede M, Little T, Card N. Action-control beliefs and behaviors as predictors of change in adjustment across the transition to middle school. Anxiety, Stress & Coping: An International Journal 2006;19:111–127.

Verhulst F, Van der Ende J. Six-year developmental course of internalizing and externalizing problem behaviors. Journal of the American Academy of Child and Adolescent Psychiatry 1992;31:924–931. [PubMed: 1400127]

Verhulst F, vanderEnde J, Ferdinand R, Kasius M. The prevalence of DSM-III-R diagnoses in a national sample of Dutch adolescents. Archives of General Psychiatry 1997;54:329–336. [PubMed: 9107149]

Wigfield A, Eccles J, MacIver D, Reuman D. Transitions during early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. Developmental Psychology 1991;27:552–565.

Wood J, Piacentini J, Bergman R, McCracken J, Barrios V. Concurrent validity of the anxiety disorders section of the anxiety disorders interview schedule for DSM-IV: Child and parent versions. Journal of Clinical Child and Adolescent Psychology 2002;31:335–342. [PubMed: 12149971]

Zimmerman MA, Ramirez-Valles J, Zapert KM, Maton KI. A longitudinal study of stress-buffering effects for urban African-American male adolescent problem behaviors and mental health. Journal of Community Psychology 2000;28:17–33.

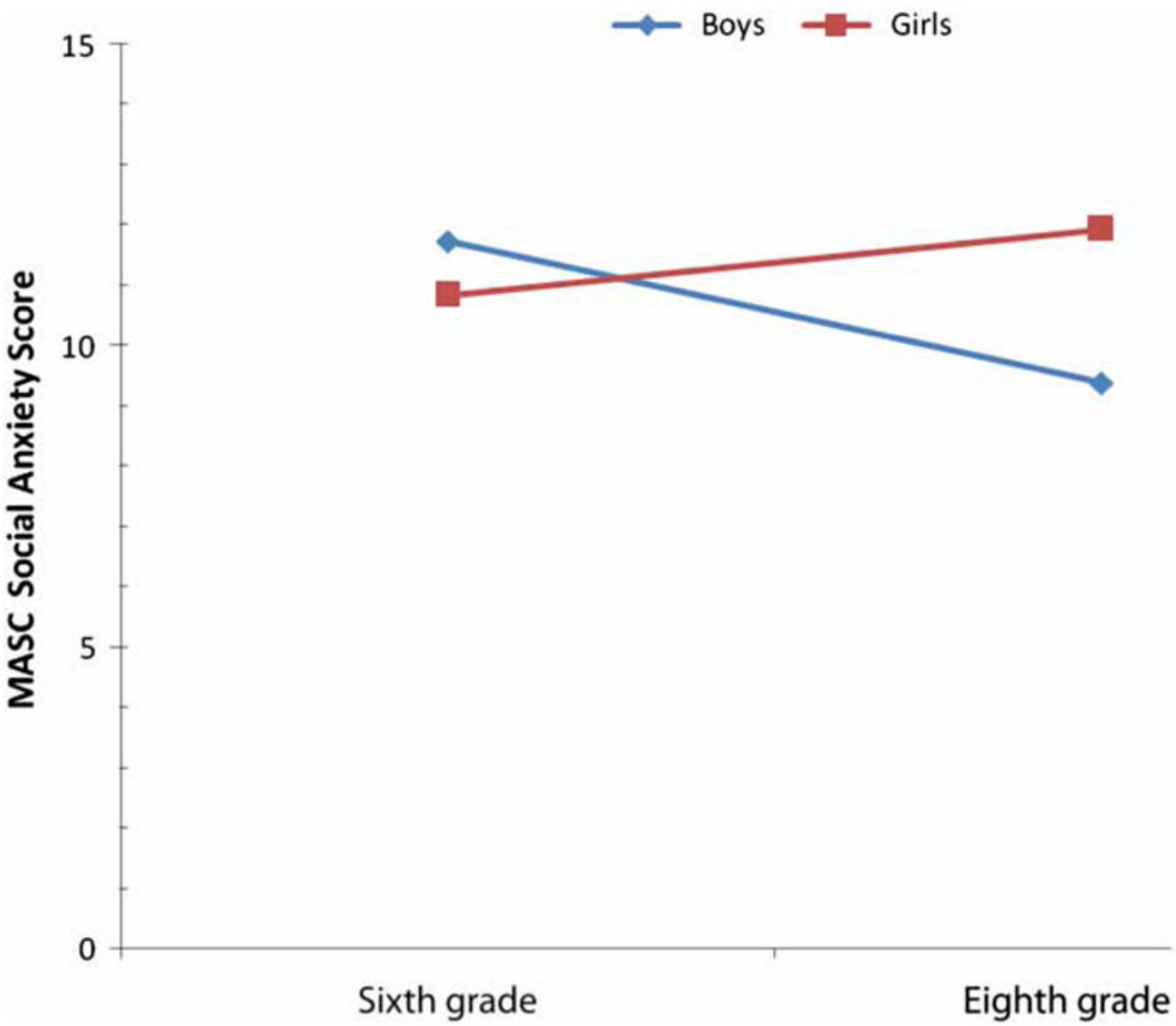

Figure 1.
Significant interaction of time and gender for MASC social anxiety scores.

Anxiety Stress Coping. Author manuscript; available in PMC 2011 October 1.

Table 1

Correlations among primary study variables.

	Gender	PSUP6	FSUP6	CSUP6	TSUP6	SOAC6	GSW6	Phys8	Harm8	Soc8
PSUP6	−.27									
FSUP6	−.22	.36*								
CSUP6	−.13	.39*	.41*							
TSUP6	−.11	.35*	.35*	.24						
SOAC6	−.13	.26	.46*	.69*	.17					
GSW6	−.30*	.40*	.37*	.57*	.46*	.42*				
Phys8	−.17	.07	0	−.17	−.08	−.19	−.30*			
Harm8	−.19	.30*	.16	.16	.24	−.11	.32*	.17		
Soc8	−.21	.04	−.05	−.27	−.09	−.36*	−.35*	.54*	.35*	
Sep8	−.30*	.10	.04	−.07	−.05	−.18	−.06	.46*	.42*	.40*

Note: Gender was coded as −1 (female) and 1 (male); PSUP6, sixth grade parental support; CSUP6, sixth grade classmate support; TSUP6, sixth grade teacher support; FSUP6, sixth grade friend support; SOAC6, sixth grade self-perceived social acceptance; GSW6, sixth grade global self worth; Phys8, MASC physical symptoms of anxiety subscale; Harm8, MASC harm avoidance aubscale; Soc8, MASC social anxiety subscale; Sep8, MASC separation anxiety subscale.

* $p < .05$.

Table 2

Means (standard deviations) of MASC scales for the overall sample, girls, and boys by time.

	Time 1 (Grade 6)			Time 2 (Grade 8)		
	Overall	**Boys**	**Girls**	**Overall**	**Boys**	**Girls**
MASC – Overall Anxiety Scale	45.4* (12.9)	43.9 (12.8)	46.8 (13.0)	40.7* (15.6)	36.0** (15.7)	45.0** (14.5)
MASC – Physical Symptoms Subscale	10.1 (5.4)	10.0 (5.2)	10.2 (5.7)	9.3 (5.6)	8.3 (5.0)	10.3 (6.0)
MASC – Harm Avoidance Subscale	17.3* (4.7)	17.0 (4.9)	17.6 (4.6)	15.5* (5.2)	14.5 (5.8)	16.4 (4.5)
MASC – Social Anxiety Subscale	11.3 (5.1)	11.7 (5.3)	10.8 (5.0)	10.7 (6.0)	9.4 (6.2)	11.9 (5.7)
MASC – Separation Anxiety Subscale	6.7* (4.0)	5.1** (3.1)	8.2** (4.2)	5.2* (4.3)	3.8** (3.3)	6.4** (4.8)

Note: Times 1 and 2 data collected approximately two years apart.

* Indicates significant overall differences for *time* with Time 1 scores significantly greater than Time 2 scores in each instance, $p < .01$.

** Indicates significant differences for *gender* with girls' scores significantly greater than boys' in each instance, $p < .01$.

Table 3

Hierarchical regressions of self-worth, social acceptance, and social support, and their interactions with gender on MASC scales.

	Harm avoidance	Physical symptoms	Separation anxiety	Social anxiety
Step	Step 1:	Step 1:	Step 1:	Step 1:
	$F_{(1,74)} = 39.62^{**}$	$F_{(1,74)} = 13.07^{**}$	$F_{(1,74)} = 29.82^{**}$	$F_{(1,74)} = 29.97^{**}$
	$R^2 = .349$	$R^2 = .150$	$R^2 = .287$	$R^2 = .288$
	Step 2:	Step 2:	Step 2:	Step 2:
	$F_{(8,67)} = 6.91^{**}$	$F_{(8,67)} = 3.50^{**}$	$F_{(8,67)} = 4.42^{**}$	$F_{(8,67)} = 7.61^{**}$
	$R^2 = .452$	$R^2 = .295$	$R^2 = .346$	$R^2 = .476$
	$F\Delta_{(7,67)} = 1.01$	$F\Delta_{(7,67)} = 1.96$	$F\Delta_{(7,67)} = .85$	$F\Delta_{(7,67)} = 3.43^{**}$
	Step 3:	Step 3:	Step 3:	Step 3:
	$F_{(14,61)} = 5.17^{**}$	$F_{(14,61)} = 1.94^{*}$	$F_{(14,61)} = 2.45^{**}$	$F_{(14,61)} = 4.46^{**}$
	$R^2 = .543$	$R^2 = .308$	$R^2 = .360$	$R^2 = .506$
	$F\Delta_{(6,61)} = 2.02$	$F\Delta_{(6,61)} = .20$	$F\Delta_{(6,61)} = .229$	$F\Delta_{(6,61)} = .62$

Variable	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β
T1 MASC	**.62**	**.12**	**.56****	**.31**	**.13**	**.30****	**.50**	**.14**	**.45**	**.48**	**.13**	**.42***
PSUP	.21	3.06	.01	5.03	3.95	.18	2.91	2.94	.13	2.35	3.43	.08
CSUP	1.76	1.55	.16	1.21	2.05	.11	.90	1.51	.10	2.67	1.82	.23
TSUP	1.38	.92	.17	.37	1.19	.04	.11	.88	.02	.46	1.05	.05
FSUP	.70	3.44	.02	−.44	4.61	−.01	−4.01	3.34	−.16	−3.44	3.92	−.10
SOAC	−2.92	1.25	−.32	−1.04	1.60	−.11	−1.61	1.19	−.21	**−3.06**	**1.39**	**−.30***
GSW	.98	1.38	.09	−4.42	1.76	−.38	−1.58	1.28	−.18	**−4.04**	**1.53**	**−.34****
Gender	−.61	.49	−.12	−1.23	.65	−.22	−.53	.53	−.12	**−1.69**	**.56**	**−.29***
G × PSUP	1.12	3.03	.04	−.75	3.99	−.03	−2.35	3.06	−.10	3.26	3.43	.11
G × CSUP	2.01	1.54	.19	−.78	2.03	−.07	−.01	1.51	−.00	−1.58	1.82	−.13
G × TSUP	1.22	.91	.15	.19	1.19	.02	−.23	.88	−.03	1.11	1.03	.12
G × FSUP	−6.81	3.44	−.21	−3.88	4.51	−.11	1.59	3.41	.06	.34	4.03	.01
G × SOAC	−3.00	1.26	−.33	−.49	1.60	−.05	.10	1.19	.01	1.41	1.41	.14
G × GSW	−1.48	1.32	−.13	.40	1.76	.03	.53	1.31	.06	−1.43	1.50	−.12

Anxiety Stress Coping. Author manuscript; available in PMC 2011 October 1.

Note: T1 MASC, Time 1 refers to the same respective subscale of the MASC as that being predicted; PSUP, sixth grade parental support; CSUP, sixth grade classmate support; TSUP, sixth grade teacher support; FSUP, sixth grade friend support; SOAC, sixth grade self-perceived social acceptance; GSW, sixth grade global self worth. Values presented are from the third (final) step of each regression (additional data available upon request). Bold values represent significant unique predictors of the respective criterion, only if their inclusion step improved R^2 significantly.

* $p < .05$;

** $p < .01$.