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Megan A. Wood
Concordia University

William M. Bukowski
Concordia University, Montreal

Jonathan Santo
jsanto@unomaha.edu

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Friendship Security, But Not Friendship Intimacy, Moderates the Stability of Anxiety During Preadolescence

Megan A. Wood and William M. Bukowski
Department of Psychology, Concordia University
Jonathan B. Santo
Department of Psychology, University of Nebraska, Omaha

Correspondence should be addressed to Megan A. Wood, Psychology, Concordia University, 7141 Sherbrooke Street West, Montreal, Quebec, H4B 1R6 Canada. E-mail: me_woo@live.concordia.ca

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A two-wave longitudinal study of 380 preadolescents (*M* age = 10.87) from largely middle- class schools in Montréal, Québec, Canada, assessed the hypothesis that friendship security, but not friendship intimacy, moderates the stability of anxiety during adolescence. This central but largely overlooked question about peer relations concerns which aspects of friendship account for the effects of friendship on emotional adjustment. Anxiety and friendship quality were measured via self-report questionnaires, employing the Network of Relationships Inventory for security and intimacy items. An index of friendship durability, which combined reciprocity and stability within first- and second-best friendship choices, was derived from sociometric measures. A latent variable path analysis examined with structural equation modeling showed that anxiety was less stable for children who perceived their friendships as secure. The moderating effect of intimacy was statistically nonsignificant. A follow-up

analysis showed that the effects of security did not result from friendship durability. These findings provide support for the long-standing but previously unaddressed hypothesis that security, rather than intimacy, accounts for friendship's effect on anxiety reduction during early adolescence.

Anxiety disorders have a prevalence rate of 12% within Canada (Public Health Agency of Canada, 2015) and 18% in the United States (Anxiety and Depression Association of America, 2015), making them the most common form of mental illness in North America. Anxiety disorders typically arise between childhood and adolescence (American Psychiatric Association, 2013), thus early adolescence is a critical time for the development of affective problems that could have long-term consequences for well-being. A long- standing theme of theory and research on anxiety is the claim that affiliation with others can lead to a reduction in anxiety (Schachter, 1959). Harry Stack Sullivan (1953) argued that close friendships during preadolescence serve to diminish and free individuals from anxiety. He believed that preadolescence is a critical period for the development of personality and, as such, individuals who might be at risk for psychological illness can be saved from serious disorders provided they receive certain friendship provisions. In the current paper, we examine the hypothesis that particular aspects of friend- ship will minimize the stability of anxiety during preadolescence.

One of the most important and central questions in the literature on peer relations concerns the protective effects of friendship (Parker, Rubin, Price, & DeRosier, 1995). Beginning with the seminal theorizing of Sullivan (1953), friendships have been ascribed with the capacity to protect school-age children from internalizing disorders. According to this perspective, the effects of friendship can be traced to specific features of friendship such as security and close- ness/intimacy (Bukowski, Motzoi, & Meyer, 2009). This concern with the significance of these specific features of friendship is an extension of the long-standing interest among philosophers and psychologists, especially develop- mental psychologists (e.g., Berndt & McCandless, 2009) in the basic features of friendships and how friendships positively affect well-being. It is widely recognized that friend- ship is a multifaceted dyadic experience that is presumed to provide benefits to friended individuals across the life span, especially during preadolescence. In parallel to the intense interest among attachment researchers in

identifying the processes and features that account for the effects of parent/infant interactions (Brumariu & Kerns, 2013; Lewis- Morrarty et al., 2015), friendship theorists and researchers are concerned with identifying which of the many aspects of friendship account for these positive effects. The goal of the present study is to assess the moderating effect of two aspects of friendship, specifically security and intimacy, on the continuity of a critical aspect of well-being, specifically anxiety, during preadolescence.

Although there is already some evidence to support the claim that friendship moderates trajectories of internalizing problems during the school-age and early adolescent period (Bukowski, Laursen, & Hoza, 2010), it is important to recognize the limitations of the comparisons on which this evidence normally rests. Typically, researchers have tested hypotheses about friendship by examining differences in adjustment between friended and unfriended girls and boys. These comparisons provide some evidence that being friended can reduce (a) the risk of being victimized (e.g., Hodges, Malone, & Perry, 1997; Wojslawowicz Bowker, Rubin, Burgess, Booth-LaForce, & Rose-Krasnor, 2006), (b) the adverse consequences of negative experiences with peers (e.g., Adams, Santo, & Bukowski, 2011; Hodges et al., 1997), and (c) the likelihood of experiencing internalizing and externalizing problems (e.g., Laursen, Bukowski, Aunola, & Nurmi, 2007). Individually and as a group, however, studies that rely on a comparison of friended and unfriended children are constrained by fundamental measurement issues that limit their capacity to reveal the richness and specificity of friendship effects.

For at least 25 years peer researchers interested in the effects of friendship have recognized that the friended/ unfriended distinction represents a limited view of friendship experiences (Buhrmester & Furman, 1986; Bukowski & Hoza, 1989; Parker & Asher, 1993). Two interrelated limitations are especially important. The first is that the simple bifurcation of children into friended or unfriended categories fails to capture any of the vast individual differences in friendship quality that are likely to distinguish one friendship from another. Although the use of the friended/unfriended distinction is useful for conducting efficient comparisons, its value as an index of friendship is constrained by its insensitivity to differences between friendships. In this way, the friended/unfriended distinction is convenient but limited in its ability to capture crucial differences between

friendships.

A second limitation is the unidimensional nature of the friended/unfriended measure. Friendship is known to be a complex multidimensional construct. Beginning with the original claims of theorists such as Sullivan (1953), friend- ship has been defined as a complex construct and experience that includes a highly differentiated set of features and qualities (e.g., Bagwell & Schmidt, 2011; Furman & Buhrmester, 1985; Furman & Rose, 2015; Poulin & Chan, 2010; Vitaro, Boivin, & Bukowski, 2009). Identifying the importance of the particular features has been recognized as a central and long-standing goal of friendship research (e.g., Bukowski & Hoza, 1989). The multiple features and provisions that have been ascribed to friendship include companionship, help, security, and opportunities for intimacy (e.g., Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993). This important goal of establishing how specific features of friendship account for particular outcomes cannot be accomplished with the dichotomous and omnibus friended/ unfriended distinction.

Although the multifaceted nature of friendship appears to be universally recognized by friendship researchers (e.g., Bukowski et al., 2009), efforts to assess how specific aspects of friendship affect particular outcomes have been rare. Accordingly, little is known about how specific aspects of friendship are associated with particular outcomes. Efforts to understand how different features of friendship affect well-being need to first address two basic questions. One question concerns which aspects of friendship are most important, whereas the other question is whether and why different aspects of friendship will affect specific outcomes in different ways. In regard to the first question, two relationship features of friendship that have been emphasized in several well-known descriptions of friendship are security and closeness/intimacy (Berndt & McCandless, 2009; Bukowski & Hoza, 1989; Bukowski et al., 2009; Furman & Rose, 2015). Sullivan (1953) noted that pre- and early adolescents seek both intimacy and security within their friendships. Consistent with theory about the central features of friendship, measures of friendship quality (e.g., Bukowski et al., 1994; Furman & Buhrmester, 1985; Parker & Asher, 1993) have typically included items designated to measure the constructs of intimacy and security. Security has been defined as the perception of responsive- ness from others and the belief that the support of one's

friend is continually present in one's life (Holmes & Anderson, 2009). Intimacy has been defined as having shared and privileged knowledge of each other's internal states that comes from self-disclosure and self-revealing behavior (Prager, 2009). It involves a level of exclusivity in one's access to another person's internal states.

The answer to the question about the differential effects of various aspects of friendship derives from the answer to the first question. Given the distinctions between security and intimacy it is likely that they will have different effects. Within friendships, security promotes an enduring sense of stability. In this way, security serves the function of stabilizing and offering provisions of continuity. Given that one of the main features of anxiety, especially generalized anxiety, is an intolerance of uncertainty (IU; Buhr & Dugas, 2006) one can reason that friendship security is likely to serve a protective role for anxious children because it provides them with a form of certainty in their lives. During preadolescence, a common source of reassurance for anxious girls and boys is likely to be the certainty that is provided by a secure friendship. In other words, the secure and dependable friend can be a source of certainty. In this way, friendship security is likely to moderate anxiety.

In contrast, intimacy can result in vulnerabilities that may come with the uncertainties about whether disclosures made in private will remain so and with whether the revelation of internal states may alter how one is perceived by his or her friend. Relative to security, intimacy is unlikely to reduce anxiety, as it has the potential to provide threats rather than to prevent them. For instance, although anxious preadolescents could have the positive intention of seeking comfort from friends who listen to their problems, it raises the threatening possibilities that confidences offered in private may be violated and revealed more broadly. For this reason, greater intimacy, especially in the form of self-disclosure, might give anxious children even more to worry about. Moreover, intimacy may lead to the continual revisiting of the same problematic issues that occur in corumination (Rose, 2002). Engaging in corumination could consequently perpetuate negative feelings over time instead of decreasing them (Rose, Carlson, & Waller, 2007), and it may result in empathic distress, which is a concept that reflects the tendency that girls in particular have of taking on the distress of others as their own (Smith & Rose, 2011). In this sense, friendship intimacy is not expected to

moderate anxiety because it might serve to reinforce anxious thinking and feelings.

Although distinct sets of items are typically available in measures of friendship quality to construct separate indices of security and intimacy, researchers have instead combined items that index these distinct concepts to create a single index of positive friendship quality (e.g., Baker & Hudson, 2013; Gauze, Bukowski, Sippola, & Aquan-Assee, 1996; Parker & Asher, 1993). This practice of using a broad and nonspecific index of friendship quality forecloses the opportunity to test hypotheses about the specific effects of particular aspects of friendship. A goal of the present study is to go beyond this traditional but limiting practice by identifying the effects of specific aspects of friendship.

Studying the factors that moderate the trajectories of anxiety during preadolescence is important for two reasons. First, anxiety disorders in adulthood are a frequent and debilitating form of impairment throughout the world (Baxter, Scott, Vos, & Whiteford, 2013). It is known that these problems can initially emerge between childhood and adolescence (American Psychiatric Association, 2013).

Second, recent research has shown that early adolescence is a time of experience-dependent restructuring in the cortex (Steinberg, 2010). Through their effects on this second developmental phase of neural reorganization, experiences in preadolescence have the potential for long-lasting effects on functioning across the remainder of the life span. Together, these two reasons point to the importance of identifying the features of experience in preadolescence that affect the trajectory of anxiety during the critical time of the life span.

THE PRESENT STUDY

The current study used a two-wave longitudinal design to assess the moderating effects of security and intimacy on the stability of anxiety across a 4-month period. The goal of the present study was to assess whether positive peer experiences, such as friendship security, would minimize negative emotional experiences like anxiety, whereas others, such as intimacy, would not. This study investigated whether anxious children who perceive their friendships as being highly secure show fewer signs of maladjustment and greater signs of positive adjustment compared to anxious children

who report having lower quality friendships. The specific hypothesis is the direct, and moderating effects of friendship security will be statistically significant and significantly stronger than the direct and moderating effects of intimacy, which are expected to be nonsignificant.

An important consideration when studying friendship quality is the need to rule out the effects of variables that may be related to friendship quality and that might account for its effects. A potentially confounding variable of this sort may be friendship stability. It is possible that having a stable friend may be a potential source of security. In our analyses the effects of friendship stability was examined to determine the extent to which it might account for the effects of security on the stability of anxiety.

It was hypothesized that children who are anxious and who have more secure friendships at Time 1 (T1) will have lower self-rated feelings of anxiety at Time 2 (T2) compared to children who have friendships at T1 that are lower in security. Specifically, self-reported secure friendships are believed to have a protective effect and will therefore decrease feelings of anxiety in anxious girls and boys over time. It is expected that this protective effect will be manifested in two interrelated ways: (a) in the lower stability of anxiety for the participants who perceive their friendship as secure in comparison to those who perceive lower levels of security in their friendship, and (b) lower levels of anxiety at T2 for the participants who showed high levels of anxiety at T1 but who perceived their friendship as secure than for those who were high in anxiety at T1 but who did not perceive their friendship to be as secure. If it is the case that the effects of friendship security derive from having a stable friend, then adding a measure of friendship stability, referred to here as durability, should account for the effects of stability. To test this hypothesis, a measure of durability was included in our models to assess for the effects of this potential confound.

METHOD

Participants

Participants were drawn from three mixed-sex public schools in inner suburbs of Montréal, Québec, Canada, attended by students from across a broad middle-class section of the socio- economic spectrum. English was the typical language of instruction

and was the primary language used by children when interacting with their peers in these school contexts. Data were collected from 430 participants (208 female, 222 male), representing more than 90% of the pool of potential participants. The minimum participation rate per class was 80%. The children were in Grades 5 (198) and 6 (232) at the time of

testing, with ages ranging from 10 to 13 (M = 10.87, SD = .73). The children remained with the same group of classroom peers for the entire school day except during a "recess" period in the morning and during a lunchtime break from classroom instruction. The data were collected in January (T1) and May (T2) from 19 classrooms at each time. Given that the participants in this study were minors, an information letter and a parental consent form were sent home to parents, which were then signed and returned to the class teacher indicating whether a parent consented or did not consent to having their child participate in the project. Child assent was also required to go forward with testing if parental consent was given. A child who did not bring back the consent forms was not permitted to take part in the study, even if they claimed to have obtained such consent. The children were given a small reward of school supplies, specifically some highlighters, for returning the consent form regardless of whether their parents gave permission for them to be on the study. Any child who completed all phases of the study was given a reward of a T-shirt bearing the laboratory's logo and the name of the university.

Procedure

After receiving approval from the university's ethics board, consent was sought from the school board and principals of the schools involved. Members of the research team were present in the classrooms during the data collections, which took approximately 1 hr per classroom. Students completed the questionnaires by paper and pen, which the researchers supplied. Participants were informed that they could withdraw from the study at any time and that there would be no negative consequences of doing so. There were no inclusion or exclusion criteria in this sample unless individuals withdrew their consent, in which case their data were removed from the study. Missing data were dealt with via multiple imputation performed with Mplus (Ver. 6; Muthén & Muthén,

2010).

Measures

Self-assessed anxiety. Using a 5-point scale, ranging from 1 (*never true*) to 5 (*always true*), the participants rated three items intended to measure feelings of general anxiety. They were "I am nervous or tense," "I worry a lot," and "I get stressed a lot." These ratings were collected at T1 and at T2. These items reflect the same content as shown by the most representative items in other self-report indices of anxiety (Chorpita, Tracey, Brown, Collica, & Barlow, 1997; March, Parker, Sullivan, Stallings, & Conners, 1997). The reliability of the anxiety measure, as indexed by Cronbach's alpha, was .75 and .76 at T1 and T2, respectively.

Friendship quality. The Network of Relationship Inventory (NRI; Furman & Buhrmester, 1985) is a 36-item questionnaire used to gain information about the perceptions of the children regarding their relationship with their best friend. For the purposes of this study, the NRI was used at both T1 and T2. Two NRI subscales were used, specifically Intimacy and Reliable Alliance. The measure of reliable alliance was used as an index of security. Each participant rated each of the NRI items on a Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Intimacy items were "How much do you talk about everything with this person?" "How much do you share your secrets and private feelings with this person?" and "How much do you talk to this person about things that you don't want others to know?" The reliable alliance/security items were "How sure are you that this relationship will last no matter what?" "How sure are you that this relationship will last regardless of fights?" and "How sure are you that this relationship will continue in the years to come?" At T1 and T2, the reliability of the intimacy measure was .80 and .83, respectively, and the reliable alliance measure was .73 and .78.

Friendship durability: Reciprocity and stability.

An unlimited-choice sociometric measure was used at each time to index friendship durability via an assessment of the intersection between friendship reciprocity

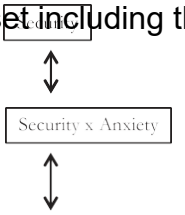
and friendship stability. Each participant was asked to choose from among the other participating same-gender peers in his or her classroom those who he or she regarded as the first best friend, the second best friend, the third best friend, and as any other best friend. Because each of the 19 classes consisted of two sets of same-gender peers (i.e., a group of girls and a group of boys), there were 38 same-gender peer groups. Because a participating child could not choose her- or himself as a friend, the size of the nominating pool for each same-gender group was one fewer than the number of participating girls or boys in the class. The size of each nominating group ranged from six to 16, with a mean and standard deviation of 10.3 and 3.3, respectively. At each of the two times, each of these choices was scored according to whether it was reciprocated (i.e., the child was chosen as a first or second best friend by the peer whom he or she had chosen as a first or second best friend). At both T1 and T2, each child was designated as having a reciprocated friend if either of the first two friend choices had chosen the child as a first or second friend. Using information about friendship reciprocity at T1 and T2, each child was designated as having a stable friend if either of his or her first two friendship choices at T1 was reciprocated as a first or second choice and if this peer was also a reciprocated friend at T2 as a first or second choice. This index was called a measure of friendship durability.

RESULTS

Preliminary Analyses

Data imputation. For each of the measures at each of the two assessment times, the scores for outliers were recoded so that their value did not differ from the group mean by more than 3 standard deviations. There was a small amount of missing data (7.2%) due in part to the absence of eight participants at T2 who had been present at T1 and to participants who did not answer every question at each time. An assessment of randomness of the missing data conducted with the Little (1988) test produced a nonsignificant chi- square value indicating that data were missing at random and that imputation was justified. The goal of the imputation was to create as complete a data set as possible. Multiple imputation, conducted with Mplus (Ver. 6; Muthén & Muthén, 2010), was used to estimate new values for missing data. The imputation procedures

created 25 new data files. These files were then aggregated (i.e., averaged) to produce a single final data set including the imputed scores. The means are presented in Table 1.



Data Analyses

Confirmatory factory analyses. Prior to conducting structural equation modeling, a confirmatory factor analysis, conducted with Mplus, was performed to evaluate the proposed measurement model. Three three-item latent variables, each representing a single construct, were evaluated. They are self-assessed anxiety, intimacy, and security. Separate analyses were conducted with the T1 and the T2 data. The confirmatory factor analysis model was observed to have an acceptable fit to the data at T1, $\chi^2(24) = 45.74$, $p < .05$, comparative fit index (CFI) = .98, root mean square error of approximation (RMSEA) = .05 (.03–.07), standardized root mean square residual (SRMR) = .04, and at T2, $\chi^2(24) = 44.84$, $p < .05$, CFI = .99, TLI = .98, RMSEA = .05 (.02–.07), SRMR = .03. With each model, each of the factor loadings was greater than .60. It should be noted that we tested a single-factor, two-factor, and three-factor model using the T1 data. The two-factor model was significantly better than the single-factor model, $\chi^2(1) = 281.36$, $p < .05$, and the three-factor model was significantly better than the two-factor model, $\chi^2(1) = 182.48$, $p < .05$.

The reliability of each of the three latent variables con- structed at each of the two times was assessed with *Omega* (McDonald, 1999). The observed values for the measures of security, intimacy, and anxiety are T1 were 0.76, 0.81, and 0.76, respectively. The corresponding values at T2 were 0.80, 0.84, and 0.77. A further set of analyses were con- ducted to assess the equivalence of the latent scores con- structed at T1 and T2. Starting with an unconstrained model, we built up the models in a stepwise fashion fixing the factor loadings, then covariances, then item intercepts, then error variances, and last the factor variances to be identical across both time points. At each step, we compared the Bayesian Information Criterion of the latest model to the previous one. The only step where the models significantly worsened was when the factor variances were constrained to be equivalent across time, $\chi^2(3) = 8.87$, $p < .05$. To explain, the T1 latent factors had marginally more variability than at T2. In all other

respects, the T1 and T2 scores were equivalent.

TABLE 1
Mean Levels of Self-Reported Anxiety, Intimacy, and Security

Item	*Time 1* M (SD)	*Time 2* M (SD)
I am nervous or tense. (Self-Rated Anxiety; Anx1)	2.18 (1.07)	2.33 (1.08)
I get stressed a lot. (Self-Rated Anxiety; Anx2)	2.35 (1.20)	2.21 (1.06)
I worry a lot. (Self-Rated Anxiety; Anx3)	2.36 (1.09)	2.26 (1.06)
How much do you talk about everything with this person? (Intimacy; Int1)	3.54 (1.27)	3.88 (1.08)
How much do you share your secrets and private feelings with this person? (Intimacy; Int2)	3.04 (1.50)	3.40 (1.38)
How much do you talk to this person about things that you don't want others to know? (Intimacy; Int3)	3.08 (1.48)	3.33 (1.39)
How sure are you that this relationship will last no matter what? (Security; Sec1)	3.97 (1.14)	3.93 (1.01)
How sure are you that this relationship will last regardless of fights? (Security; Sec2)	3.73 (1.31)	3.88 (1.22)
How sure are you that this relationship will continue in the years to come? (Security; Sec3)	4.09 (1.10)	4.09 (1.05)

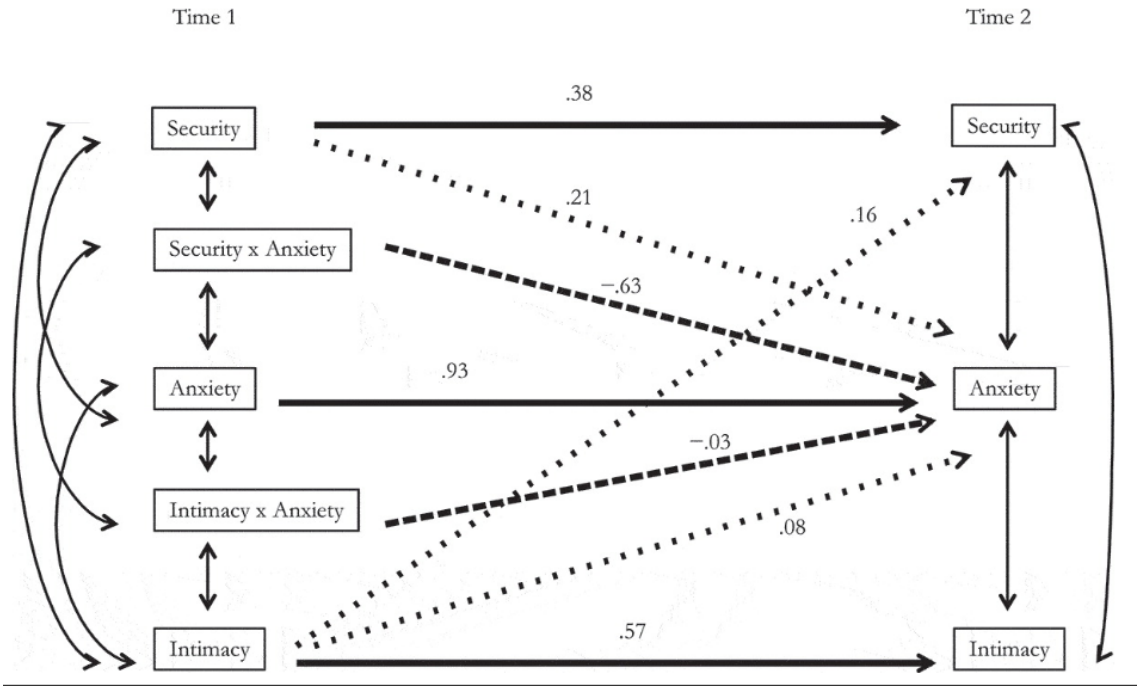


FIGURE 1 Associations between the Time 1 and Time 2 variables with moderators of the stability of anxiety. *Note*. For clarity, individual correlations between the items have been omitted.

Structural equation modelling. An observed variable structural equation model, conducted with Mplus and clustering the data by class, was used to test the study's hypotheses (see Figure 1). A series of models were assessed. The first model was a simple auto-correlation and within-time covariance model that included three univariate indices (i.e., security, intimacy, and anxiety) at each of T1 and T2 and two interaction scores (i.e., Intimacy × Anxiety and Security × Anxiety) from T1. Its purpose was to function as a baseline model to which subsequent models could be compared and to assess the stability of the measures of security, intimacy, and anxiety. In this model we included (a) direct paths from measures of intimacy, security, and anxiety at T1 to the corresponding measures at T2, and (b) covariances between all of the scores at each of the two times. This model showed a minimally adequate level of fit, $\chi^2(16) = 39.12$, $p < .01$, CFI = .99, RMSEA = .058 (.035–.081), SRMR = .05. The standardized coefficients for the autoregressive paths to T2 from T1 were .38, .55, and .45 for the anxiety, intimacy, and security paths, respectively. Intimacy and security were positively associated with each other at T1 (standardized coefficient = .47. $p < .05$).

Two new paths were added to the second model. These paths were from the measures of security and intimacy at T1 to the measure of anxiety at T2. The purpose of this model was to assess the direct univariate effects of security and intimacy at T1 on anxiety at T2. This model also showed an increased adequate level of fit, $\chi^2(14) = 32.27$ $p < .004$, CFI = .99, RMSEA = .055 (.03–.08), SRMR = .043, $\Delta\chi^2(2) = 6.89$, $p < .03$. The coefficient of the pathway from T1 security to T2 anxiety was observed to be negative and significant (standardized coefficient = –.13, $t = -2.63$, $p < .01$); the coefficient of pathway from T1 intimacy was observed to be very small and not statistically significant (standardized coefficient = .05, $t = 1.17$, $p > .2$).

The third model included two new paths, specifically the scores representing the interaction between T1 security and T1 anxiety, and the interaction between T1 intimacy and T1 anxiety. These scores were used to predict the T2 measure of anxiety. This model showed a significant increase in fit, $\chi^2(12) = 22.80$, $p < .03$, CFI = .98, RMSEA = .046 (.014–.074), SRMR = .043, $\Delta\chi^2(2) = 9.47$, $p < .009$. The effect of the index interaction between T1 intimacy and T1 anxiety on T2 anxiety was not observed to be statistically significant (standardized coefficient = .03, $t = .24$, $p > .05$).

In contrast, the effect of the interaction between T1 security and T1 anxiety on T2 anxiety was observed to be statistically significant (standardized coefficient = –.63, t = −2.665, p < .008). A clarification of the significant interaction between T1 anxiety and T1 security predicting T2 anxiety is shown in Figure 2.

Model modification indices indicated that the fit of the model could be improved by including a path from the T1 measure of intimacy to the T2 measure of security. When this path was added to the model the fit of the model improved significantly, $\chi^2(11) = 11.16$, $p < .43$, CFI = 1.00, RMSEA = .006 (.00–.05), SRMR = .03, $\Delta\chi^2(1) = 11.64$, $p < .009$. The coefficient of the pathway from

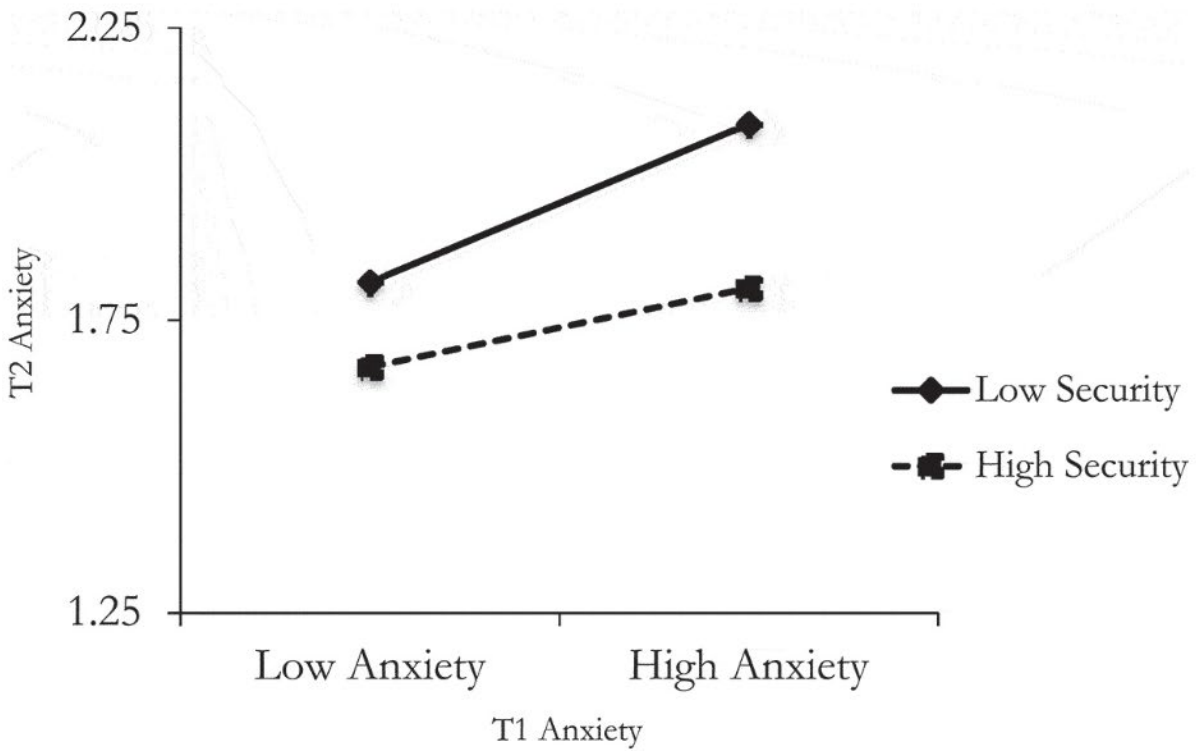


FIGURE 2 The moderating effect of Time 1 (T1) security on the association between T1 and Time 2 (T2) anxiety.

T1 intimacy to T2 security was observed to be positive and significant (standardized coefficient = .21, t = 3.47, p < .001). Simple effects tests were used to assess whether the effect of T1 anxiety in T2 anxiety was significant at different levels of the measure of security. The gradient for the simple slope of T1 anxiety on T2

anxiety for children high in security (+1 *SD* above the mean) was not significant (*b* = .12), *t*(429) = .60, *p* > .05, whereas the gradient for children low in security (−1 *SD* above the mean) was significant (*b* = .32), *t*(429) = 1.98, *p* < .05.

A follow-up to the main analysis was conducted as a further and more direct test of the difference between the effect of the interaction between security ad anxiety and between intimacy and anxiety. Although it was known already that the effect of the T1 interaction between security and anxiety on T2 anxiety was statistically significant, whereas the effect of the T1 interaction between intimacy and anxiety on T2 anxiety was not statistically significant, these findings do not reveal whether these two effects differ from each other. To assess whether these effects differed from one another, a model in which these effects were constrained to be equal to each other was examined. If these effects were not equal to each other, then this model should be significantly worse than a model in which the each effect was allowed to be free. This new model was observed to have a worse fit, $\chi^2(12) = 14.74$, $p > .25$, CFI = .99, RMSEA = .02, SRMR = .03, $\Delta\chi^2(1) = 3.59$, $p < .055$.

Two supplemental sets of analyses were conducted. The purpose of the first set was to examine whether the main and interactive effects of the measures of security and intimacy at T1 on the T2 measure of anxiety varied as a function of gender. To assess whether these effects differed for girls and boys, a new model was constructed that included four new variables at T1. The four new scores were (a) the two-way interaction between gender and security; (b) the two-way interaction between gender and intimacy; (c) the three-way interaction between gender, security and anxiety; and (d) the three-way interaction between gender, intimacy, and anxiety. In a baseline model, these four scores were added to the final model used in the main analyses. In this baseline model, the new scores were shown as covarying with the other T1 scores. This model was observed to have a reason- ably good level of fit, $\chi^2(23) = 51.616$, $p < .001$, CFI = .99, RMSEA = .05 (.035–.073), SRMR = .047. In a second model, direct pathways were added in which the four new scores had direct effects on T2 measure of anxiety. This model was also observed to have a good fit, but it did not differ from the baseline model, $\chi^2(19) = 48.59$, $p < .001$, CFI = .98, RMSEA = .06 (.039–.081), SRMR = .045, $\Delta\chi^2(4) = 3.02$, $p > .5$. None of the coefficients for the four new pathways was observed

to be statistically significant (all *p*s > .4). Each of the effects observed to be significant in the main analysis continued to be observed as significant in this model.

The purpose of the second set of additional analyses was to examine whether the T1 measure of friendship mutuality, the measure of friendship durability, could account for the effects of the T1 measure of security. As in the previous supplemental analysis, four additional variables were added to the final model used in the main analysis. Two of these measures, specifically the T1 measure of mutual friendship and the measure of friendship durability, were univariate indices and the other two were interaction scores, specifically the two-way interaction between T1 friendship mutuality and T1 anxiety and the two-way interaction between the measure of friendship durability and the T1 measure of anxiety. In this baseline model the new scores were shown as covarying with the other T1 scores. This model was observed to have a reasonably good level of fit, $\chi^2(14) = 20.583$, $p < .11$, CFI = .99, RMSEA = .03 (.0–.062), SRMR = .024. In a second model, direct path- ways were added in which the four new scores had direct effects on T2 measure of anxiety. This model was also observed to have a good fit, but it did not differ from the baseline model, $\chi^2(10) = 16.295$, $p < .12$, CFI = .99, RMSEA = .03 (.00–.061), SRMR = .021, $\Delta\chi^2(4) = 3.458$, $p > .5$. None of the coefficients for the four new pathways was observed to be statistically significant (all *p*s > .25). All of the effects observed to be significant in the main analysis were observed to be significant in the model that included the main and interaction scores for reciprocity and durability.

DISCUSSION

The central hypothesis of this study was that felt security in one's friendship during preadolescence moderates the stability of anxiety. It was specifically argued that anxious children who have secure friendships would have lower self- reported feelings of anxiety over time compared with children who have friendships that are lower in security. This hypothesis derives from one of the most basic, but largely untested, premises of theory on research regarding pre- and early adolescent friendship, specifically that security in friendship functions to reduce anxiety. A second hypothesis of this study was the claim that intimacy within friendships would not provide the same

buffering effects on anxiety as those provided by security and that the effects of security would be significantly stronger than those of intimacy. Both hypotheses were supported by our findings. The study's central finding is the observation that anxiety was less stable in children who had highly secure relationships with their friends than it was for anxious children who did not experience their friendships as being secure. In contrast, no direct or moderating effects were observed for intimacy, and these effects were observed to be significantly weaker than the effects of security. The results of this study support and extend other findings on the protective role of friendship for anxious youth (e.g., Erath, Flanagan, Bierman, & Tu, 2010; Rose et al., 2011) and the hypothesis that high-quality friendships buffer maladjustment (Sullivan, 1953). Notably, no gender differences were found in this study. Essentially, a greater decrease in anxiety occurs over time for both anxious boys and anxious girls who experience high levels of security within their close friendships when compared with anxious boys and anxious girls with friendships rated low in security.

One possible explanation for these findings may be related to the interface between the basic features of anxiety and the provisions of security. As previously mentioned, IU is understood to be highly related to worry, which comprised a part of the anxiety measure in the current study(i.e., the item "I worry a lot"). In a longitudinal study of youth, Dugas, Laugesen, and Bukowski (2012) reported that a change in IU could partially mediate a change in worry and that a change in worry could partially mediate a change in IU (i.e., the effects were bidirectional). Although not specifically assessed in the present study, it is possible that friendship security is protective for anxious children because it provides them with a form of certainty in their lives. In other words, if young individuals are highly worried and strive to gain reassurance from their environments, one of the main sources of reassurance may come from their friends with whom they have formed reliable and secure bonds. This speaks to the "durability" in relationships that Sullivan (1953) noted to be so important during preadolescence.

Also, as predicted, our results indicate that friendship intimacy does not successfully moderate anxiety over time. These results support the findings of Festa and Ginsburg (2011), who reported that intimacy within friendships does not reduce social anxiety in children. It may be the case that anxious youth participate in

corumination with their friends, that is, discussing and revisiting the same issues at length and dwelling on them (Rose, 2002), which could maintain negative affect (Rose et al., 2007). In fact, it is possible that intimacy might be manifested in corumination because it can be a coping strategy for some (Rose & Rudolph, 2006). Although individuals may engage in corumination to reduce negative emotions, it may conversely cause empathic dis- tress (see Smith & Rose, 2011). It may also be the case that anxious preadolescents increase the risk of their private information being shared with others once they have confided in close friends, which may also be a potential source of worry.

The present findings regarding the functional differences between security and intimacy speak to the enduring question about the central features of interpersonal relationships. Already the construct of security has been identified as a core component of relationships across the life span and one that accounts for positive effects that relationships have on well-being (Blatz, 1966; Salter (Ainsworth), 1938). Just as security has been identified as a core feature of parent– infant relationships (Cassidy, 2008), the results of our study point to its importance as a key component of friend- ship. In his security theory, Blatz argued that within relationships, security derives from both the individual and the partner and that it contributes to the continuity of the relationship as well as the capacity of the individual to navigate challenges in multiple domains of functioning. In these ways, Blatz's ideas are at least in part parallel to those of Sullivan (1953) as they point to the critical role of security in multiple forms of relationship experience.

The present findings show that that security in friendship is a moderator of anxiety in preadolescence, whereas intimacy is not. Although one might be inclined to conclude that security should be seen as the core feature of friendship, there are important reasons to avoid this interpretation. Given the multidimensional nature of friendship, it is unlikely that the effects of friendship can be reduced to a single feature of this complex relationship. Multiple functions and processes have been ascribed to friendship (Bagwell & Schmidt, 2011) including the validation of the self, protection from victimization, and help and support for achievement-related outcomes. Surely all of these effects cannot derive entirely from a single aspect of friendship experience. For

example, although the current findings failed to find any effect of intimacy on anxiety, there is no reason to think that this form of closeness may, at least in the short term, be a form of validation that has positive effects for the self. Indeed, an unexpected finding from this study was the observation that the T1 intimacy score was an antecedent to the T2 reliable alliance score. In other words, intimacy was an antecedent to security. Clearly a major goal of theory and research on friendship should be a more carefully articulated understanding of how and why specific aspects of friendship are associated with particular outcomes. From our point of view, the present article begins this new direction in friendship research.

Beyond the need for more precise theoretical guidance to

direct the formulation of more carefully specified hypotheses about the effects of particular aspects of friendship, there is a complementary need to reconsider our measures of friendship. Typically, friendship has been indexed with two distinct procedures (Berndt & McCandless, 2009; Bukowski, Cillessen, & Velásquez, 2012); Bukowski & Hoza, 1989). One uses sociometric data scores to indicate whether a child has a mutual friend (i.e., whether a child is chosen by one of the peers whom the child chose as a friend). The other uses self-report measures that assess the features or qualities that children perceive or experience within their friendships (Bagwell & Schmidt, 2011). These measures include Bukowski and colleagues' (1994) Friendship Quality Scale, Parker and Asher's (1993) Friendship Quality Questionnaire, and Furman and Buhrmester's (1985) NRI, the measure used in the current study. The friendship quality measures compensate for the main limitation of the reciprocity index derived from socio- metric data. The sociometric measure provides a very simple and objective unidimensional indicator of whether one's peer experiences meet the most basic and defining feature of friendship (i.e., reciprocated liking), thus it provides no information about the specific properties of a friendship.

In contrast, as Bagwell and Schmidt (2011) have shown, the friendship quality measures were developed to assess individual differences on multiple dimensions identified by philosophers, social scientists, and children themselves as the core features of friendship (Bukowski et al., 2009). In each case, items were written to index specific dimensions of friendship. In spite of the rich multidimensional composition of

these measures, researchers have typically combined items of these different measures so as to create an aggregated broadband index of positive friendship quality (Baker & Hudson, 2013; Gauze et al., 1996; Parker & Asher, 1993). This practice of collapsing across dimensions to create a single positive dimension (and a single negative dimension) is the typical procedure with the NRI (Furman & Buhrmester, 1985). The present findings speak against each of these traditional means of measuring friendship. In regard to the use of sociometric measures, the index of friendship durability failed to reveal any effects. In regard to the use of the measures of friendship quality, the results of our confirmatory factor analyses show that the items for security and intimacy were manifestations of different underlying latent factors. More important, structural equation modeling revealed different results for one aspect of friendship (i.e., security) than for the other (i.e., intimacy). The use of a broadband friendship quality measure may not have revealed an effect of friendship, and it would not have provided the specificity of the results shown by the present analyses. At a time prior to the development of powerful statistical techniques that are currently available, the practice of creating broadband scores may have been seen as the only reasonable option. At the present moment when more sensitive procedures exist, researchers have a broader range of options for measuring friendship. Research on peer relations would benefit from using these procedures in conjunction with clear measures of particular aspects of friendship experience to obtain a more precise understanding of how friendship affects well-being.

It is, of course, conceivable that some ideas about the effects of friendship may invoke a less differentiated or more general conceptualization of friendship quality that does not favor one friendship quality over another. In cases in which differences are not expected between narrow-band scores that index a single aspect of friendship the use of an aggregated measure that combines multiple features of friendship would be a preferred strategy. Surely, researchers need to make an informed decision about whether a test of their hypotheses calls for the use of measures of well-specified aspects of friendship or whether it is appropriate to use a more general broadband measure. It is important that researchers recognize that the use of a broad aggregated score is not the only option.

A further issue regarding the measurement of friendship concerns the distinction between indices derived from socio- metric procedures, such as whether a child has a mutual friend, and measures of friendship quality based on self- report measures such as the NRI (Furman & Buhrmester, 1985) that was used in the present study, Bukowski et al.'s (1994) Friendship Quality Scale, and Parker and Asher's (1993) Friendship Quality Questionnaire. Although the distinction between these approaches is well known (see Bagwell & Schmidt, 2011, and Bukowski & Hoza, 1989, for a thorough discussion), empirical efforts to understand the different effects, merits, and advantages associated with each approach have been rare. A slight exception to this trend occurs in the present study when a measure of friend- ship durability (i.e., an index of whether a child maintained the same friend from T1 to T2) was used to assess whether the effects of security could be attributed to the experience of having a consistent friendship. As we have reported, the measure of friendship durability could not account for the effects the of the security measure (i.e., its moderating effect on the association between T1 and the T2 anxiety scores). It was also unrelated to the measures of security at T1 and T2. This evidence of the divergence between the measure derived from sociometric data and those derived from the self-report measures adds to the view that the meaning of the sociometric-based measures is highly differentiated or even ambiguous. For example, it is conceivable that friend- ship durability may result from contextual factors such as shared activities or being from the same neighborhood rather than from interaction-based experiences that promote a sense of security. The continued evolution of research on the features and effects of friendship would benefit from a clearer understanding of how these two approaches to friendship are interrelated and of how each approach can be used appropriately and effectively as a means of indexing friendship experience.

It is always important to consider whether a set of findings observed with one set of participants can be generalized to other samples. The participants in this study were drawn from families and neighborhoods in Québec that are broadly representative of the middle of the socioeconomic status spectrum. As a group their ethnicity can be described as Anglophone Québécoise. Questions about the generalizability of the present findings can be most profitably framed according to whether the protective

functions of friendship security are contextually invariant. Currently there is a grave lack of empirical studies of cultural variability in the features and effects of friendship. Accordingly, it is difficult to reach conclusions, except in a wildly speculative manner, about the generality of our findings. Specifically, it is not clear that the protective significance of friendship security will be a fixed effect across contexts. Although one might be tempted to use evidence indicating cultural continuity in the processes related to secure attachment to parents, it may be wise to resist this temptation. The contextual invariance of parent–child attachment may be the result of the atavistic roots of this form of relationship. In contrast, the friendship relation may not have the same ethological foundations to support the continuity of its effects across contexts.

Another form of generalization concerns whether these same effects would be observed at all ages. Research on developmental changes in children's conceptions of the friendship relation have shown that older school-age children (i.e., 10 to 12 years of age) and early adolescents are more likely than younger children to identify security-related constructs such as loyalty as one of friendship's core features (Berndt, 1986; Bigelow, 1977; Bukowski, Newcomb, & Hoza, 1987; Selman, 1981). These findings would suggest that the protective effects of friendship security are likely to increase as children enter the older school- age years.

Several strengths present in this study are worth noting. Primarily, data were collected from a large community sample of preadolescent individuals. Gathering data from a community population allows for the provision of information on the majority of anxious youth, rather than focusing on relatively smaller clinical, and possibly skewed, subsamples. In addition, this study was conducted longitudinally and could therefore detect changes in affect over time. Moreover, advanced statistical methods were employed to analyze the data in order to detect the moderation effects that were present. Another key feature was the use of multiple means of measuring friendship. The present findings point to the greater importance of the measures of friendship quality, particularly the measure of reliable alliance, relative to the measures derived from sociometric measure. This evidence points to the importance of measuring friendship quality instead of just friendship reciprocity.

No study is without its limitations. One potential limitation is the reliance on self-

report measures. Although self- report measures may be inappropriate for some constructs, in the present case they provide a direct index of the variables of interest (Chan, 2009). For anxiety, the child is the information source with the most direct access to these feelings. For this reason, self-reports may be the best measure. For security and intimacy, the variable of interest in this study was preadolescents' *perceptions* of these features of their friendships (that may or may not be consistent with other reports); thus self-report is also the measure best suited to gauge friendship quality in this study. The legitimate concern that observed associations between self-report measures may be inflated by shared measurement variance is mitigated in the present study by our overriding concern with the effects of the interactions rather than with main effects. Presumably the effects of shared measurement variance would have been accounted for in the first model examined in our analysis. There is no reason to expect that shared measurement variance could have inflated the effects observed for the interaction measures. The lack of an observed effect for the interaction between anxiety and intimacy is consistent with this view.

A second potential limitation concerns our use of an index of anxiety that is not domain specific. Surely the use of a general measure of anxiety has it strengths. Nevertheless it is known that anxiety can be associated with particular forms of functioning such as social (Van Zalk, Van Zalk, Kerr, & Stattin, 2011) and academic (Raufelder, Hoferichter, Schneeweiß, & Wood, 2015) functioning. Future research needs to assess whether the effects of friendship security has equal effects of these different forms of anxiety.

A third possible limitation is our emphasis on anxiety as an outcome rather than on its antecedents. One antecedent condition may be intolerance of uncertainty (Dugas et al., 2012). Future research should assess whether the effects of friendship security come from its capacity to minimize or disrupt the impact of the processes that lead to anxiety.

Overall, it is well known that peers are central to the lives of young individuals. It is also recognized that anxiety typically arises during childhood and adolescence, which may lead to more serious anxiety disorders that occur at a high prevalence within North America. The present study sought to understand the relative importance of specific

features of friendship that could attenuate the experience of anxiety in preadolescents. The results presented here reveal that possessing high levels of security within close relationships with peers functions to alleviate feelings of anxiety in preadolescent girls and boys when compared with their anxious peers with low levels of friendship security. However, friendship intimacy does not serve the same function as security, as it did not moderate anxiety in youth. Promoting secure friend- ships for anxious preadolescents is particularly important given the extensive literature on poor friendship quality characteristically found in anxious populations (e.g., Crawford & Manassis, 2011; Greco & Morris, 2005). The results of this study add to the empirical and theoretical literature that demonstrates the positive effects that peer relationships can provide to anxious young individuals. Taken together, with the knowledge that anxious youth risk facing numerous difficulties and that friendships are integral to the life of preadolescents, this study contributes to the body of work on the protective effects of possessing high-quality friendships in childhood.

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