Understanding the Complex Dynamics of Friendship Experiences: Implications for Well-being and Adjustment in Early Adolescence

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Abstract

Understanding the Complex Dynamics of Friendship Experiences: Implications for Well-being and Adjustment in Early Adolescence

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Adolescence is considered to be a sensitive time in the lifespan. Social experiences that occur during this time contribute to one's sense of self and belonging within the peer group, which has important implications for later outcomes. Positive peer interactions can function as an antidote to internalizing symptoms (e.g., anxiety, depressed affect) by providing security- and intimacy-based experiences, whereas negative experiences (e.g., being disliked, excluded) are known to have unfavourable consequences on development. The aim of this project was to investigate the relationship between specific friendship features and experiences that occur across contexts (dyadic, classroom) and emotional adjustment in a sample of adolescents. This was achieved by conducting three longitudinal studies using self-report and sociometric data collected from fifth and sixth grade students in Montréal, Canada and Barranquilla, Colombia. The results of **Study 1** provided support for the use of a measurement burst design methodology to account for momentary deviations in self-reported internalizing symptomology. Specifically, the burst design was found to provide a more stable and reliable measure of anxiety compared to traditional single-time longitudinal measurement designs. **Study 2** assessed the degree to which perceived friendship quality (security, intimacy) and various classroom-level features (e.g., individualism, collectivism, acceptance/density, SES) minimize the continuity of social anxiety among youth. Support was found for the protective function of friendship security on anxiety, and classroom-levels of individualism and acceptance/density were found to strengthen the negative effect of security across the school year. Intimacy was also found to be an important source of emotion regulation for lower SES groups and groups that are highly individualistic. **Study 3** employed the benefits of a burst design to investigate how depressed affect influences accurate awareness of youth's level of acceptance among their peer group. Findings suggested that higher levels of depressed affect make early adolescents insensitive to actual levels of social acceptance from their peers, despite the fact that it may be objectively higher. Together, these studies improve our understanding of how important features of friendship quality contribute to adolescents' well-being, as well as how negative peer experiences and depressed affect function together to influence self-perceptions.

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Contribution of Authors

Bianca Panarello	Study conception, design, data organization, planned and executed analyses, writing, editing, proofing.
William M. Bukowski	Research supervisor, funding, oversaw and assisted research/ measure design, study conception and coordination, relevant analyses, editing and proofing
Ryan J. Persram	Facilitated data collection process
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General Introduction

During the transition from middle childhood to early adolescence, peer relationships take on a heightened level of significance as the provisions offered by close friendships overlap with those previously provided by parental figures (Furman, 1989; Laursen et al., 2021). With the increased importance of peer support and peer influence, friends become a developmental asset for early adolescents (Furman, 1989) who may be at risk for developing internalizing psychopathology (e.g., depression, anxiety). Given that the onset of symptoms often parallels the time in the lifespan when peer relationships are highly influential (Veed et al., 2018), peer networks are deemed to be critical and powerful contributors in this process, in that peers can maintain, promote or mitigate the development of mental health difficulties, as well as buffer the consequences of adverse environmental experiences (Laursen et al., 2021). Thus, the overarching goal of the present dissertation was to provide further insight into the possible friendship factors and experiences that make peer relationships so influential.

Compared to friendship at earlier stages of development, friendship in early adolescence is voluntary, more stable, and more likely to be reciprocated. As children approach ten years of age, their understanding of friendship changes, and they begin to develop a clearer idea of those who they do and do not want to be friends with. What was once important in childhood (e.g., convenience, interesting toys, similar expectations about play) is no longer so, as features such as shared values, loyalty and self-disclosure becoming increasingly important in early adolescence (Rubin et al., 2015). Therefore, at this stage friendship choice and stability are typically influenced by the specific characteristics and features present among their best friendships, such that friendships high in relationship quality and those characterized by positive types of interactions are more likely to persist over time (Berndt, 2004).

Friendship quality in particular, is reported to be an important dimension of friendship since friendships among children and early adolescents can vary considerably in their types of interactions (e.g., self-disclosure, conflict) and in the features (e.g., security, intimacy) that characterize them (Berndt, 1996). Importantly, there is strong empirical support for the claim that children's interactions with their friends, as well as their participation in friendships can have direct and indirect influences on their cognitive, social, and emotional adjustment (Bagwell & Bukowski, 2018). Specifically, positive friendship quality has been associated with positive psychosocial adjustment and functioning; namely, increased self-worth and social competence, lower levels of depression, loneliness, and problem behaviours, and higher levels of moral reasoning (e.g., Hiatt et al., 2015; LaGreca & Harrison, 2005; McDonald et al., 2014).

Security and Intimacy as Important Features of Friendship Quality

However, in order to truly understand the developmental significance of friendship, one must consider the ways in which individual friendship features may exert their effects. The protective function ascribed to friendship dates back to claims made by Sullivan (1954) which suggested that close relationships function as security-based systems (Sullivan, 1954). Previous research has demonstrated that high levels of security among friendships was protective against internalizing distress, anxiety, and peer victimization (Schmidt & Bagwell, 2007; Wood et al., 2017; Wood et al., 2014). Consistent with the basic premise of attachment theory, the development of a secure attachment relationship with a best friend leads a child to develop the belief that their best friend is someone that can be relied upon for protection, nurturance, comfort, and security during times of need (Bagwell & Bukowski, 2018). Thus, security, a positive feature of friendship quality, can function to reduce or minimize the continuity of anxiety among early adolescents by providing reassurance and certainty (Wood et al., 2017).

Another specific dimension of friendship that warrants a discussion is intimacy. Intimacy among friends involves self-disclosure of internal states, thoughts and feelings (Bukowski & Kramer, 1988), and has been associated with increased closeness and self-esteem. It is not surprising, however, that there appears to be consistent qualitative differences in the best friendships of boys and girls in middle childhood and early adolescence with respect to intimacy, such that friendships between girls generally consist of greater levels of intimacy and self-disclosure compared to those of boys (Davila & Kornienko, 2022; Rose, 2022). While intimacy is considered to be a positive aspect of friendship quality, intimate disclosure between peers also has the potential to become hazardous via the process of co-rumination.

Co-rumination involves a pattern of communication in which negative thoughts and feelings are repeatedly shared and discussed among friends, which can sustain or exacerbate internalizing symptomology (Rose, 2002). Although this form of self-disclosure can contribute to greater feelings of intimacy, co-ruminating about a certain issue does not allow one to regulate their negative emotions or to engage in effective problem solving (Bagwell & Bukowski, 2018; Rose, 2002). Nonetheless, by providing emotional support and validation, friendships have the potential to promote resilience and to provide a context in which children can develop important social skills, coping mechanisms, emotion regulation abilities, and a sense of self (Bagwell & Schmidt, 2011).

Peer Interactions and Self Perceptions

Adolescence is a transitional period during which adolescents also engage in heightened levels of self-exploration. It is a time when most are beginning the process of finding out who they are and who they want to be (Steiger et al., 2014). A longstanding claim in psychology is that social relationships play a fundamental role in shaping an individual's level of self-esteem (Leary,

2012). Adolescents rely heavily on external feedback (both overt and subtle) and validation to form the basis of their self-worth, defined as their overall evaluations of their value as a human being (Harter, 1999; Mihalec-Adkins & Cooley, 2020). Given this, the types of social experiences with peers, as well as their perceptions of what others think of them can have important implications on the self-concept (Rosenberg et al., 1989).

Being accepted (e.g., well-liked) by others during the school age satisfies the deeply rooted human desire to belong and to connect with others (Baumeister & Leary, 1995) and has been shown to contribute to well-being, positive emotions and academic performance (Raufelder et al., 2021). With the development of more abstract reasoning and a greater capacity for self-reflection, early adolescents begin to conceptualize their self-worth by making social comparisons and generalizations from specific peer experiences (Garber & Flynn, 1998; Rubenstein et al., 2016). Typically, a child with low feelings of self-worth is seen as experiencing a difference between who he or she is and who he or she wants to be. Also, positive peer experiences are said to reinforce the belief that one is well-functioning and socially competent (Rubin, Bukowski, & Parker, 1998), whereas negative experiences (e.g., interpersonal rejection) may lead to decreases in self-esteem (Burwell & Shirk, 2006). However, since feelings of the self are said to derive largely from experiences with peers (Sullivan, 1954), an important consideration here is the degree to which one's awareness of their experiences is accurate. It is possible that various person-related variables, such as depressed affect (e.g., negative inferential style) may impede one's awareness of these experiences (Beck, 1983).

Measurement of Friendship

Evidently, given that various peer-related experiences and processes can offer various social provisions or risks for youth, valid and reliable ways of assessing and measuring such

features are imperative. To date, peer research employs two common methods to assess peer-related experiences; these include sociometric and self-report assessments.

Sociometric assessments are considered to be the gold-standard among developmental researchers for studying how accepted (i.e., well-liked) and rejected (i.e., disliked) children and adolescents are within their respective peer groups (Bukowski et al., 2017; Cillessen & Bukowski, 2018). To accomplish this, participants are asked to identify peers that they like the most/least within a reference group (e.g., their classroom) via nominations of their limited or unlimited choice of same-sex or other-sex best friends (Bukowski & Newcomb, 1984). Participants are then asked to rate how much they like each of their classmates on a 5-point Likert scale ranging from "not at all" to "like very much". Nomination scores and liking ratings are then calculated and adjusted for biases in classroom size. While sociometric techniques provide insight into a child's position within their peer group, children and adolescents' self-reports are the preferred approach when the aim is to assess specific aspects of friendship quality (see Berndt & McCandless, 2009). Participants report on dimensions of positive (e.g., help, trust, loyalty, security, intimacy, disclosure) and negative (e.g., conflict, rivalry, betrayal) friendship quality features via the administration of self-report questionnaires, which are known to have several advantages compared to other methods of data collection (see Berne et al., 2013). Measurements on such indices can shed light into the specific aspects of peer experiences and the individual friendship features that function as developmental assets and/or risk factors for behavioural or affective maladjustment (Rubin et al., 2015).

However, it is important to consider that children's friendships in middle childhood are often embedded within a larger group context (e.g., classroom), which makes it difficult for researchers to distinguish dyadic friendship effects from group effects (Rubin et al., 2015).

Fortunately, recent advances in multilevel modeling techniques have made this task less challenging and have allowed for the examination of individual, dyadic, and group level effects simultaneously (Rubin et al., 2015), which was the primary objective of Study 2 in this dissertation.

Measurement Of Internalizing Symptoms

With respect to methods of assessing affective and social experiences, self-report questionnaires allow researchers to gather information about one's private feelings and overall well-being (Persram et al., 2021). In particular, it has been shown that adolescents are accurate and reliable informants about their subjective experiences, and that they are able to provide ratings on various internalizing (e.g., anxiety, depressed affect) and externalizing (e.g., aggression) constructs that they feel represent them best (Persram et al., 2021). Research has emphasized the importance of obtaining self-perceptions as this helps to shed light on their internal working models and cognitive representation of themselves, which is most predictive of internalizing symptomology (Cole er al., 1996; Zimmer-Gembeck et al., 2007). In fact, prior research indicates that children's self-views are only moderately related to objective measures of competence (Harter, 1985), which emphasizes the need to compare both objective and subjective indicators of various psychological constructs, when possible.

Moreover, traditional longitudinal research designs which involve measurements taken at multiple time points across time are often used to assess the degree to which affective states and psychological phenomena are maintained or change over time. While this technique can be useful for assessing change, it can be argued that it prevents researchers from being able to capture time- or situation- specific variability on the construct of interest. Perhaps then, measurement designs which take into consideration momentary deviations in state mood levels would be better suited to detect intraindividual variability and change. The measurement burst design methodology does

just that; it is a form of assessment which involves taking multiple observations within the same time point or wave of assessment (Nesselroade, 1990; Sliwinski, 2008). Although the use of measurement burst designs is still emerging in peer research, the present research sought to address this important limitation by incorporating a burst-design methodology to assess various internalizing symptomology among youth.

The Present Research Studies

The purpose of the present studies was to improve our understanding of how peer experiences in both dyadic and group contexts can influence commonly experienced internalizing symptoms and perceptions of the self in the early adolescent period. To do this, each of three studies addressed a specific goal. The purpose of the first study was to demonstrate that a measurement burst design (where two assessments are collected at each wave of assessment) provides a more stable and reliable measure of internalizing constructs often studied in peer research such as anxiety. Relatedly, the second study had two specific goals. First, it aimed to replicate the existing finding in the peer relations literature that friendship security functions to reduce anxiety among early adolescents. Given that friendship in adolescence typically occurs within the larger classroom context, the second study also sought to shed light on the importance of considering the influence of various group-level variables when assessing the degree to which friendship quality features (namely security and intimacy) affect internalizing symptom (social anxiety) trajectories. Finally, the third study aimed to explore the degree to which depressed affect may influence accurate awareness of youth's level of acceptance among their peer group. In particular, the third study also employed a burst design format to reliably capture and assess depressed affect and levels of peer acceptance among early adolescents.

Taken together, this research focused on better understanding the influence of both positive and negative friendship experiences on the well-being and overall adjustment of early adolescents, and how these variables interacted. It also sought to encourage future researchers to consider alternative research designs that aim to improve the measurement and reliability of commonly studied internalizing symptomology constructs, and to refrain from separating the influence of dyadic relationships from the influences that occur as a result of the larger group context in which they are embedded. Finally, the current series of studies emphasized the utility of comparing objective and subjective reports of internalizing symptomology so as to provide important insights into youth's internal working models and cognitive representations of themselves and of their peer relationships.

Study 1: Assessing Intraindividual Variability in Internalizing Symptoms Among Youth Using a Measurement Burst Design Methodology

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Abstract

The present study evaluated whether the use of a measurement burst design methodology improves the accuracy and stability for adolescent-reported measures of social and test anxiety. It was hypothesized that the stability for self-reported anxiety would be stronger when using the measurement burst approach (assessments of a set of constructs are made at two or more times in quick succession) versus single time observations. Participants included youth between 10 and 13 years old who completed measures of social and test anxiety across three times, with two assessments made at each burst. Findings broadly showed that the stability of anxiety scores was significantly stronger with the measurement burst design, when compared to the single time assessment method, supporting our main hypothesis.

Assessing Intradindividual Variability in Internalizing Symptoms Among Youth Using a Measurement Burst Design Methodology

A central feature of theory about well-being in early adolescence is the claim that experiences with anxiety can be moderated by positive friendships (Sullivan, 1953). Although this period of the lifespan is marked by increased social pressures and comparisons, findings illustrate the well-known protective effect that peers can have on anxiety across the school year (e.g., Wood et al., 2017). However, for those who experience difficulties within their peer groups, anxiety can emerge and put youth at risk for developing other forms of anxiety and/or comorbid problems, as well as have a negative impact on their functioning both at home and at school (Hong et al., 2017). Studies comparing youth living with anxiety compared to their non-anxious peers have demonstrated that anxious children tend to exhibit a heightened level of negative affect and sensitivity in situations that present little or no threat, and lack confidence in their abilities to cope with and regulate their negative emotional state (e.g., Woodgate et al., 2020). Nonetheless, it is important to consider that the day-to day experiences of early adolescents may vary over time given the many contexts in which they function. As such, we argue in the present study that the degree of variability across common experiences in adolescence are critical to consider when the measurement of important psychological constructs, such as anxiety, is concerned.

Anxiety as a Multidimensional Construct

Anxiety is a multidimensional construct. It is comprised of maladaptive processes that interact to affect the various ways in which symptoms can be experienced, manifested, and maintained (Barlow et al., 2014). Specifically, prominent models of anxiety suggest that it is made up of three largely interrelated components: (1) cognitive, which involve one's subjective interpretation of internal and external stimuli, (2) physiological, which refers to an individual's internal state, and (3), behavioural, which is how one responds to these stimuli (Panarello &

Bukowski, 2021). Although longitudinal studies have demonstrated that symptoms of anxiety remain relatively stable over time in youth across a three-year period (Gullone et al., 2001), as well as from early childhood through adolescence (Bosquet & Egeland, 2006), there are important developmental differences in the expression and continuation of anxiety symptoms across age groups that should be considered (e.g., Field & Lester, 2010). For example, school-age children are typically less sophisticated in their coping and avoidance strategies, which may lead them to externalize their symptoms, thus displaying more overt signs of anxiety which can include somatic complaints (e.g., stomach aches, headaches), irritability, nail biting, inattentiveness, and distractibility (Muris et al., 2008). Due to the limitations in their cognitive development, younger children may have difficulty accurately labeling and identifying their anxious thoughts, feelings, and worries. Whereas symptoms of generalized anxiety are less frequent among younger children, they tend to become more apparent in early adolescence (Broeren & Murris, 2009). As a result of the developmental changes that occur during the transition between childhood and adolescence, children's cognitive capacities become increasingly developed, and their fears may start to revolve around anticipatory events and more abstract stimuli (Gullone, 2000). Thus, cognitive vulnerabilities to anxiety such as worry can emerge and play an important role in the early teenage years (Panarello & Bukowski, 2021).

In addition to the fact that the interplay between the cognitive and physiological components of anxiety can be very distressing for a young adolescent, this developmental period is also a time that is characterized by many biological, social and cognitive changes which also pose unique challenges (Nelemans et al., 2017). Teenagers who are unable to effectively cope with the changes and uncertainties associated with the onset of adolescence are at an increased risk for experiencing levels of anxiety that may interfere in their participation in various social and

academic opportunities (McEvoy & Mahoney, 2012). For instance, youth with heightened levels of anxiety may worry about seemingly mundane tasks and events, such as their performance at school or in other activities and may be hypervigilant to slight changes in their social relationships. It is also possible that anxious youth worry more about their health and that of their close others, and about other unpredictable events out of their control that could have implications on their overall well-being (Woodgate et al., 2020).

Social and Test Anxiety as Common Experiences Among Young Adolescents

Child mental health is markedly influenced by the peer system, which begins to play an integral role in childhood and early adolescence, as children become peer-, rather than family-centered (Rubin et al., 2006). Adolescents and their peers function in many contexts including the social and academic domains, with children typically spending up to half of their waking hours at school (Nelemans et al., 2017; Silver et al., 2010). As such, the pressures of performing well academically and maintaining positive relationships with peers and teachers can be critical to feelings of self-worth and overall well-being, with some children becoming hypersensitive to criticisms and approval by their peers (Silver et al., 2010).

Relatedly, it is well documented that anxiety can be context-dependent, such that it might be more pronounced in one situation relative to another (Carleton, 2016). Specifically, while the degree of uncertainty can be similar across two separate settings, an individual may feel more comfortable and competent, and believe that they possess the adequate skills to be able to respond in one context more effectively (e.g., social situations) compared to another (e.g., testing situations) (Panarello & Bukowski, 2021). Despite this important consideration, items found across common childhood measures of anxiety (e.g., Multidimensional Anxiety Scale for Children – Second Edition (MASC-2; March, 2013) lack contextual specificity and breadth. While the

measures are designed to differentiate between different types of anxiety (e.g., social anxiety, separation anxiety, phobia), the items themselves fail to include context-specific information, which can make it especially challenging for a child to relate to the items being presented (Panarello & Bukowski, 2021). This may also prevent investigators from acquiring important information regarding whether a child is anxious across all contexts, or more anxious in one context compared to another (Panarello & Bukowski, 2021).

To address this limitation, this study sought to assess children's anxiety in two developmentally salient contexts: (a) socially and (b) academically. Individuals with social anxiety typically present with negative thoughts prior to, during, and after social interactions or socially evaluative circumstances (Hearn et al., 2017). Often, these negatively-valenced thoughts and worries pertain to how others perceive them and their behaviours, and how they perceive themselves during social situations. On the other hand, young adolescents with heightened feelings of test anxiety typically feel tense, afraid, and worried when confronted with evaluative situations, which can have a negative impact on their learning and overall academic performance (Spielberger & Vagg, 1995; Sub & Prabha, 2003). In accordance with a cognitive-attentional model of test anxiety, students may experience an influx of task-relevant (e.g., worries about the self and one's performance), as well as task-irrelevant thoughts and worries, which can interfere with one's ability to focus, resulting in physiological hyper-arousal and either adaptive (e.g., studying more for a test) or maladaptive behaviours (e.g., skipping items) (Wigfield & Eccles, 1989; Wine, 1971).

Measurement of Anxiety

Across research and clinical practice, the most commonly used and preferred method of assessing early adolescent's affective experiences involves obtaining respondents' subjective reports via self-report measures. As illustrated by Berne and colleagues (2013), self-report

questionnaires have several advantages compared to other methods in that they allow researchers to collect large amounts of data in a relatively short period of time and at a low cost. Also, self-report measures are simple to administer and are quick for respondents to complete. This is especially valuable in the context of longitudinal studies where researchers must maximize participants' time and level of engagement. Importantly, self-report questionnaires allow researchers to obtain information about one's private experiences, which may be missed by peers, teachers, and/or parents (Thomas et al., 2015).

Across the anxiety literature, studies typically employ longitudinal designs in an effort to track changes in anxiety across time, or a pre-post design where symptoms are measured before and after the administration of a specific treatment (e.g., Kerns et al., 2013; Nelemans et al., 2017). While both of these methodological designs are effective ways of assessing change or stability, they fail to fully consider intraindividual variabilities in human behaviour (e.g., Fiske & Rice, 1955). Given what is known about anxiety and the influence of environmental factors (e.g., context), relying on a single measurement at two separate times may not be entirely representative of an individual's true or "general" level of anxiety. For instance, when collecting data within individual classrooms, it is highly possible that students may have either had or will have an exam, which can significantly affect levels of test anxiety. Similarly, as social anxiety scores are concerned, it could be that an interpersonal event took place at school the day of the data collection (e.g., group project, disagreement with a peer) which could have affected a child's overall level of social anxiety. Thus, we argue that a measurement burst design, which incorporates the benefits of both a longitudinal and short-term within-person level of analysis, is a more effective and precise way of assessing changes in anxiety levels across time, given that it addresses the difficulties that arise when measuring variables that can fluctuate as a result of daily experiences.

The Present Study

In this study, our aim was to demonstrate that a burst design methodology provides a more accurate, stable, and reliable measurement of young adolescents' internalizing symptoms of social and test anxiety. Specifically, we hypothesized that a longitudinal design with three bursts, each with two assessments, would demonstrate superior levels of internal consistency and measurement stability when compared to a single-time longitudinal design using two separate samples of early adolescents. The data collection took place at three separate waves (Time 1: T1, Time 2: T2, and Time 3: T3). Within each wave or burst of assessment, two assessments were collected, separated by one week, which produced six different observations for each participant.

Method

Participants

Two samples of data were used in which the burst design format was employed to assess self-reported levels of anxiety.

Sample 1

Sample 1 consisted of 351 fifth (53% girls) and sixth (51% girls) grade students, between 10 and 12 years old (168 male, 183 female) from Barranquilla, Colombia (N = 174), and Montréal, Canada (N = 177). Data were collected from 11 separate classrooms from five mixed-gender schools in lower-middle and upper-middle class neighbourhoods. Three schools from Montréal participated in this study, one of which was designated as upper-middle class (n = 79) and the other two as lower-middle class (n = 98). In Colombia, the designation for these classes is based on the government-assigned *estrato* index, ranging from 1 to 6, with higher scores indicating neighbourhoods with greater affluence. There were two schools that participated in this study, one of which was upper-middle (estrato 5 to 6) (n = 74), while the other school was designated as

lower-middle (estrato 2 to 3) (n = 100). The participation rate per classroom was high (M =89%, range = 75% - 100%).

Sample 2

Sample 2 consisted of 164 fifth (40% boys) and sixth (57% boys) grade students between 10 and 12 years old (87 male, 77 female) attending two schools in Montréal, Canada. There were 11 classrooms and represented 80% of the potential pool of participants (range = 70% - 94%). The mean age of the participants was 11.5 years. In this study, one school was designated as lower-middle class (n = 67) while the other was classified as upper-middle class (n = 97).

Procedure

The procedure of the present study was approved by the Human Research Ethics Committee at Concordia University (see Appendix A). We also obtained informed consent from the school board and the school principals. For each sample of participants, adolescents were recruited in their classrooms during class time, and were provided with detailed letters outlining the objectives and requirements of the current study to bring home to their primary caregiver (See Appendix B). Child assent was obtained, and parental consent forms were signed and returned to each child's classroom teacher (see Appendix C). Adolescents who did not return a signed consent letter or rescinded their assent were not included in the data analyses. Once parental consent was obtained, the dates during which the 3 waves of data collection (T1, T2 and T3) would take place were arranged with each participating school. Time 1 was typically at the beginning of the school year, Time 2 occurred approximately eight weeks later, and Time 3 occurred eight weeks after Time 2. Within each wave, two assessments were collected within one week of each other. Thus, participating children completed self-report questionnaires at their desks using tablet computers at six separate time points. Trained members of the research team were present during each data

collection. If at any point a child wished to discontinue their participation, their data was discarded. There were no specific inclusion/exclusion criteria. For all Spanish-speaking participants, consent forms, documents, and items were all translated and back-translated by native Spanish speakers who were also fluent in English to ensure proper translation and Spanish dialect.

Measures

At each of the six assessment times, participants rated items designed to assess anxiety in both the social and test contexts using a five-point scale with endpoints *never* (1) and *almost always* (5). Higher scores on each of these items indicated higher levels of anxiety. Participants were instructed to indicate how much each statement generally describes them and were not provided with specific windows of reference (e.g., in the past week, month).

Social Anxiety

In both samples**,** the same three items were used to measure social anxiety within each burst, at all three times: (1) "I can feel nervous when I am with other kids in my class"; (2) "I worry about what other people might think of me"; and (3) "Sometimes I am afraid that some people in my class might make fun of me".

Test Anxiety

Using a five-point scale with endpoints *never* (1) and *almost always* (5), children in Samples 1 and 2 rated three items that were designed to assess levels of test anxiety within each burst, at each time: (1) "I worry about not doing well in a test in school"; (2) "I get nervous before I have to take a test in class"; and (3) "After I take a test I worry a lot about how I did on it".

Plan of Analysis

Data analyses were conducted in various steps. First, within each sample, mean scores were computed in order to represent participant scores at different times (see Table 1 for descriptive

statistics). Six mean scores were created to represent the mean of all participating student's scores at each of the six assessment times. In order to assess the strength of the burst design format, three additional mean scores were computed which represented the combination of scores from bursts 1 and 2 within each of the three waves of assessment (i.e., T1, T2, T3). In total, nine mean scores were computed within the social anxiety domain, and nine mean scores were computed within the test anxiety domain. Next, Pearson bivariate correlations were computed to assess the associations between the nine mean scores within each domain (see Table 1). The final set of analyses involved testing the statistical difference between correlation coefficients, based on a *Z*-score comparison test, as suggested by Steiger (1980).

Results

Descriptive Statistics

Mean Scores

In the first set of analyses, mean scores of social anxiety and test anxiety were used to (1) compare overall levels of anxiety across both domains of functioning, and (2) to assess the degree of stability of each form of anxiety over time. Test anxiety scores were observed to be consistently higher compared to scores on measures of social anxiety among both samples of participants, with mean levels ranging from 2.83 to 3.43 for test anxiety, and from 2.18 to 2.50 for social anxiety (see Table 1). To examine mean-level changes across time, a series of Generalized Linear Models (GLM) were estimated separately for each type of anxiety and sample (estimated adjusted using the Greenhouse-Geisser correction). The results from models that included the six assessments times revealed that the main effect of time was not statistically significant for social anxiety in any of the samples (Sample 1: $F(3.39, 373) = 2.1$, $p = .09$, $\eta p^2 = .02$; Sample 2 $F(4.53, 1{,}589) = 1.35$, $p = .24$, $\eta p^2 = .004$). When the GLM were estimated including the three bursts, the results revealed the presence of a statistically significant main effect of time for social anxiety in Sample 1 $F(1.74,$

276) = 5.42, p = .01, ηp^2 = .03, but not in Sample 2 F(1.89, 670) = .05, p = .94, ηp^2 = .000). As displayed in Table 1, social anxiety as measured by the burst design seemed to decrease with time, although this effect was small in magnitude. Regarding test anxiety, the GLM that included six measurement times revealed that the main effect of time was statistically significant for test anxiety in both samples (Sample 1: F(3.91, 430) = 6.39, p < .000, ηp^2 = .06; Sample 2: F(4.39, 1,536) = 6.69, p < .000, ηp^2 = .02). The same result was observed with the GLM that included the three bursts (Sample 1: F(1.92, 306) = 13.83, p < .000 ., ηp^2 = .08; Sample 2: F(1.85, 649) = 5.94, p = .01 ., ηp^2 = .02). As seen in Table 1, test anxiety scores tended to decrease with time, although this effect was small in magnitude.

Internal Consistency and Multilevel Reliability

The next set of analyses evaluated the degree of internal consistency among the measures of anxiety in both the social and test domains, across the two samples. Social anxiety scores and test anxiety scores demonstrated good levels of internal consistency at all three waves of assessment, with Cronbach's α ranging from .73 to .93, and .72 to .93, respectively. Greater levels of internal consistency were observed among the combined burst scores compared to the single burst scores. Next, we evaluated these scales using multilevel reliability which was assessed at each of the three times. For social anxiety, we found that the within-level ω ranged between .82 and .89 for Sample 1 and between .76 and .86 for Sample 2. The between-level ω was between .84 and .90 for Sample 1 and between .93 and .95 for Sample 2. Regarding test anxiety, within-level ω estimates were between .84 and. 90 for Sample 1, and between .79 and .88 for Sample 2, whereas the between-level ω ranged from .83 to. 98 for Sample 1 and was .99 at each time in Sample 2. Descriptive statistics calculated for these two measures of anxiety and their respective alphas at each time are presented in Table 1.

Correlation Comparisons

The goal of the final set of analyses was to determine whether the measurement burst design, which combines the two measurements at each burst, demonstrated superior levels of stability for both measures of anxiety compared to data used from a single time. To do this, correlation coefficients observed using the measurement burst design format and those obtained using data from a single time at each of the three times were compared using Steiger's (1980) correlation comparison technique. When comparing Pearson bivariate correlations between the nine mean scores within each domain (social and test), analyses revealed that the across-time correlations among the combined burst measures were greater compared to the correlation coefficients of single-time measures across time (see Table 2). All but one of the observed *Z* scores assessing change from T1 to T2 and T2 to T3, were observed to be statistically significant, surpassing the critical value of 1.96 in both domains of functioning (see Table 2). The *Z*-score representing the difference between T2 and T3 levels of social anxiety in Sample 1 when using a measurement burst design versus data from a single time was observed to be statistically nonsignificant (Z_{obs} = -1.61, p = .053). Briefly, evidence obtained across all analyses suggests that the measurement burst design demonstrates stronger estimates of stability and reliability among both samples of participants when compared to data drawn from a single time point.

Discussion

The primary aim of this study was to demonstrate the benefits of using a measurement burst design when assessing change and stability over time in internalizing symptoms among youth. Our findings suggest that when compared to a longitudinal design employing a single data collection point, the measurement burst demonstrated superior levels of internal consistency and measurement stability on measures of social and test anxiety.

First, we hypothesized that measures of social and test anxiety would be more reliable when two successive data collections were combined to produce one mean score, compared to the use of a single data point at each wave of assessment. Analyses provided broad support for this hypothesis, in that measures of social and test anxiety at all three times demonstrated greater levels of internal consistency when the measurement burst design method was used. While one could argue that this finding may be due to the fact that the same items were used across time, and that reliability increases as the number of items that make up the scale also increases (Torabi, 1994), the measurement burst design's ability to account for intraindividual variability via the multilevel reliability estimates still support its utility.

In addition, our hypothesis that mean levels of anxiety obtained using the measurement burst design method would provide better indices of change across time compared to scores derived from a single time point was also supported. Specifically, a statistically significant difference was observed between the strength of the across-time associations of both forms of anxiety when comparing the correlation coefficients obtained using a burst design and those obtained with a traditional longitudinal framework, with the measurement burst design demonstrating stronger associations across the three times. Importantly, all of the observed *Z* scores, with one exception, surpassed the critical value of 1.96 (assuming an alpha of 0.05), which speaks to the strength of our findings. While the *Z* score correlation comparison calculation (Steiger, 1980) did not demonstrate a statistically significant difference across measures of social anxiety from T2 to T3 for Sample 1 only, it did appear as a trend, and we argue that it still provides support for our initial hypothesis. Specifically, the obtained *Z* score of -1.61 would be on the verge of significance if a less rigorous cut-off value were used ($p = 0.053$). In light of these findings, it is evident that multiple bursts of measurement minimize the impact of within-person variability

and ensures that scores obtained on measures of psychological constructs are accurate reflections of each participant's true level of the construct, rather than their level at one very specific moment in time (McHale et al., 2014). While this was the objective of the present study, some studies may wish to assess the within-person fluctuations across variables. Thus, it is worth noting that the measurement burst method should be used in accordance with each study's specific design and objectives. Given what is known about internalizing symptoms and their tendency to fluctuate as a result of environmental factors, our findings provide further support for the use of assessing change in psychological constructs using a measurement burst design.

With regards to the differences in the individual trajectories of social and test anxiety across the academic year, our analyses revealed greater mean levels of test anxiety compared to levels of social anxiety among both samples of participants. While our analyses showed that both measures of anxiety were consistent over time, mean levels of test anxiety generally decreased across the three times, whereas mean levels of social anxiety remained relatively consistent in both samples. These findings are in line with previous literature, in that studies report a stable pattern of social anxiety symptoms across adolescence (e.g., Danneel et al., 2020; Nelemans et al., 2014). In considering test anxiety scores, although there is much uncertainty with regards to a teacher's preferred format for administering examinations at the beginning of the school year, this becomes more predictable as the year progresses. With time, students become better acquainted with their teacher's exam style, organization and expectations, and their previous test-taking experiences likely serve to minimize anxiety and increase both self-confidence and overall performance (Wigfield & Eccles, 1989). Thus, this may explain why mean levels of test anxiety were found to decrease across time in our data.

Strengths, Limitations, and Future Directions

To our knowledge, longitudinal changes in various forms of anxiety using a measurement burst design methodology in two large community samples of preadolescents has not yet been investigated. Given that the application of the measurement burst design has mostly been used across studies with adult participants (e.g., Lee et al., 2018), we argue that this should become more common practice across developmental research.

The use of the measurement burst design encompasses the benefits of longitudinal and short-term within-person levels of analysis, by allowing us to assess developmental changes in internalizing symptoms across the academic school year with more precision and reliability. Understanding the developmental trajectory of anxiety among youth is crucial as it can be an important indicator of problematic anxiety and other comorbid problems that may emerge later on (Broeren et al., 2013). However, this can only be facilitated if proper measurement techniques are used which minimize the potential influences of external circumstances that can occur at any given moment, that serve to inflate or exaggerate levels of anxiety. The application of the measurement burst design in our research minimizes this possibility, and thus is a major strength of the present investigation.

Although this study has a number of strengths, it is not without its limitations. It should be considered that while anxiety is a multidimensional construct, the measure used in this chapter to assess both levels of social and test anxiety captured only the cognitive component of anxiety known as worry (Fialko et al., 2012). Thus, future work would benefit from implementing a measure of anxiety that also captures the physiological and behavioral components to ensure that the experience of anxiety among youth is captured fully. Also, given that anxiety and depressed affect are often comorbid (Hong et al., 2017), future investigations should control for its potential

influence on self-reports of anxiety. Another avenue for future research would be to examine how the burst design method would relate to the assessment of other psychological constructs, and to assess how relationship factors experienced at each burst of assessment, such as security and intimacy among friendships, can influence the trajectory of internalizing symptoms.

The present findings are particularly relevant to both the theoretical and practical domains. Beyond providing further empirical support for the stability of two forms of anxiety among early adolescents, the current study highlights the advantages of using the measurement burst design when assessing psychological constructs. Our findings also have important practical implications for the treatment of anxiety among youth, in that the within-person information that is made available via the use of the measurement burst method provides unique information with respect to the targets and timing of interventions (Smyth et al., 2017). Specifically, the measurement burst method allows for each individual to serve as their own control, and as such, various antecedents and processes that can affect an individual's mental health trajectory can be identified and targeted in treatment, enhancing the effectiveness of the intervention.

Table 1. *Descriptive Statistics and Reliability of the Measures of Anxiety by Time*

Measure	**Single**							**Burst**		
	T1-1	**T1-2**	**T2-1**	**T2-2**	**T3-1**	**T3-2**		**T1**	**T2**	**T3**
Sample 1										
Social Anxiety										
M (SD)	2.50 (1.04)	2.46 (1.11)	2.38 (1.11)	2.38 (1.15)	2.18 (1.08)	2.29 (1.10)		2.48 (.98)	2.38 (1.06)	2.24 (1.05)
α	.79 [.72, .84]	.82 [.76, .87]	.80 [.73, .85]	.84 [.79, .88]	.89 [.85, .92]	.88 [.85, .91]		.87 [.82, .89]	.89 [.85, .91]	.93 [.92, .95]
Within-level ω								.82	.84	.89
Between-level ω								.90	.88	.84
Test Anxiety										
M (SD)	3.27 (1.07)	3.00 (1.20)	2.96 (1.13)	2.95 (1.19)	2.83 (1.10)	2.84 (1.21)		3.14 (1.05)	2.95 (1.09)	2.83 (1.09)
α	.81 [.75, .85]	.87 [.83, .91]	.83 [.78, .88]	.88 [.84, .91]	.87 [.83, .90]	.92 [.90, .94]		.89 [.87, .92]	.91 [.88, .93]	.93 [.91, .95]
Within-level ω								.84	.86	.90
Between-level ω								.98	.86	.83
Sample 2										
Social Anxiety										
M (SD)	2.45 (1.12)	2.36 (1.15)	2.43 (1.18)	2.40 (1.14)	2.37 (1.18)	2.47 (1.18)		2.40 (1.03)	2.42 (1.05)	2.42 (1.08)
α	.73 [.68, .78]	.77 [.73, 81]	.83 [.79, .86]	.82 [.78, .85]	.86 [.83, .88]	.86 [.86, .84]		.84 [.81, .86]	.87 [.85, .89]	.89 [.87, .91]
Within-level ω								.76	.83	.86
Between-level ω								.95	.93	.95
Test Anxiety										
M (SD)	3.43 (1.04)	3.28 (1.19)	3.35 (1.09)	3.20 (1.21)	3.25 (1.17)	3.15 (1.24)		3.35 (1.01)	3.27 (1.06)	3.20 (1.11)
α	.72 [.67, .77]	.83 [.80, .86]	.80 [.76, .83]	.86 [.83, .88]	.86 [.83, .88]	.90 [.88, .91]		.85 [.83, .87]	.88 [.86, .90]	.91 [.89, .92]
Within-level ω								.79	.83	.88
Between-level ω								.99	.99	.99

Table 2.

Comparison of Correlation Coefficients on Measures of Anxiety

		Pearson's *r*		R^2	
Correlation Comparison	Z_{obs}	**Single**	**Burst**	**Single**	**Burst**
Sample 1					
Social Anxiety					
T1-1/T2-1 versus T1/T2 Burst	-4.81	.63 [.53, .71]	.77 [.70, .82]	0.40	0.59
T1-2/T2-2 versus T1/T2 Burst	-3.71	.67 [.58, .74]	.77 [.70, .82]	0.45	0.59
T2-1/T3-1 versus T2/T3 Burst	-1.61	.76 [.69, .82]	.79 [.73, .84]	0.58	0.62
T2-2/T3-2 versus T2/T3 Burst	-3.72	.72 [.64, .78]	.79 [.73, .84]	0.52	0.62
Test Anxiety					
T1-1/T2-1 versus T1/T2 Burst	-3.92	.65 [.56, .73]	.75 [.68, .81]	0.42	0.56
T1-2/T2-2 versus T1/T2 Burst	-3.30	.67 [.58, .74]	.75 [.68, .81]	0.45	0.56
T2-1/T3-1 versus T2/T3 Burst	-4.18	.70 [.62, .77]	.80 [.74, .85]	0.49	0.64
T2-2/T3-2 versus T2/T3 Burst	-3.94	.71 [.63, .78]	.80 [.74, .85]	0.50	0.64
Sample 2					
Social Anxiety					
T1-1/T2-1 versus T1/T2 Burst	-3.21	.64 [.57, .70]	.71 [.61, .76]	0.41	0.50
T1-2/T2-2 versus T1/T2 Burst	-7.11	.54 [.46, .61]	.71 [.61, .76]	0.29	0.50
T2-1/T3-1 versus T2/T3 Burst	-6.76	.61 [.54, .67]	.76 [.71, .80]	0.37	0.58
T2-2/T3-2 versus T2/T3 Burst	-4.76	.66 [.60, .72]	.76 [.71, .80]	0.44	0.58
Test Anxiety					
T1-1/T2-1 versus T1/T2 Burst	-4.13	.58 [.51, .65]	.68 [.62, .73]	0.34	0.46
T1-2/T2-2 versus T1/T2 Burst	-4.93	.57 [.50, .64]	.68 [.62, .73]	0.32	0.46
T2-1/T3-1 versus T2/T3 Burst	-4.88	.67 [.61, .72]	.77 [.72, .81]	0.45	0.59
T2-2/T3-2 versus T2/T3 Burst	-6.50	.64 [.57, .70]	.77 [.72, .81]	0.41	0.59

Study 2: Group Level Features and Friendship Moderate Trajectories of Anxiety in Adolescence

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Abstract

Prior research has demonstrated that peers can function as an antidote to anxiety by providing security-based experiences. This study builds on prior support for this hypothesis at the level of the dyad by assessing the degree to which group features minimize the continuity of social anxiety across the academic year. Our analyses focused on (a) same-gender group norms for individualism, collectivism, acceptance/density, and SES, and (b) security and intimacy as distinct forms of perceived friendship quality. It was expected that security and groups characterized by high levels of collectivism, acceptance/density, and SES would lead to decreases in social anxiety over time. Participants were youth in fifth and sixth grade from Montréal, Canada and Barranquilla, Colombia who completed a self-report measure and a rating-based sociometric measure to obtain indexes of perceived friendship quality, social anxiety, individualism, collectivism, SES, and acceptance/density. Hierarchical linear modeling provided further support for the protective effect of friendship security on anxiety and showed that group-levels of individualism and acceptance/density strengthen the negative effect of security over time. Intimacy was also found to be particularly important for children in lower SES groups and those characterized by high levels of individualism. These findings demonstrated that features of the larger peer group can also serve as a source of emotion regulation for youth.

Group Level Features and Friendship Moderate Trajectories of Anxiety in Adolescence

Sullivan (1953) theorized that friendships have the capacity to protect school-age children from internalizing symptoms. Prior research provides an overwhelming amount of support for this claim (e.g., Bukowski et al., 2010; Laursen et al., 2007), in that friends provide significant emotional and social support, which enhances well-being and self-worth by satisfying the social need for companionship, intimacy, and acceptance (Hartup, 1993; Way & Silverman, 2012). Of course, the quality of the types of interactions between close friends are crucial when considering the role that friendship plays in emotion regulation and adjustment (Bowker, 2004; Bukowski et al., 2009; Sullivan, 1953). In fact, low levels of friendship quality have been associated with heightened levels of peer victimization, depressive symptoms, and internalizing problems (Haas et al., 2021). Although peer experiences and dynamics are often studied at the dyadic level, it has been well established that individual persons develop within a complex system of relationships, which are affected by multiple levels of their surrounding environment (Bronfenbrenner, 1979; Way & Silverman, 2012). Given that most friendships are nested within larger peer networks or groups (DeLay et al., 2021), the present study is aimed at investigating the degree to which dyadic friendship features that are known to influence internalizing symptoms (e.g., security, intimacy) are moderated by group-level characteristics.

Features of Friendship Quality (Security & Intimacy)

While peer relationships serve several functions, perhaps the most important function of friendship is its ability to provide youth with a base of security that extends beyond the family, from which they can explore their environments (Rubin et al., 2015; Rubin et al., 2008). Security, defined as a long-lasting, affective bond between individuals (Persram et al., 2021) has been identified as the central feature of the relationship experience (Blatz, 1966). It has been shown that

friendship security moderates the continuity of anxiety among early adolescents (Wood et al., 2017) by promoting an enduring sense of stability, and thus certainty. Moreover, Way and colleagues (2005) found that for youth from lower socioeconomic status backgrounds, friendship features such as security were found to be protective. In light of these findings, it is reasonable to assume that during moments of heightened anxiety and uncertainty, young adolescents likely seek reassurance from their close friends, with whom they share a secure bond (Panarello & Bukowski, 2019; Wood et al., 2017).

Measures of friendship quality have also typically included the construct of intimacy (e.g., Bukowski et al., 1994; Parker & Asher, 1993). In contrast to security, intimate friendships are characterized by higher levels of emotional disclosure, and thus, the sharing of internal states (Rose, 2002; Wood et al., 2017). While this process has been associated with lower levels of depressive symptoms (Pelkonen et al., 2003), higher levels of self-esteem (Brown et al., 2009), and increased closeness among dyads, intimacy may also lead to co-rumination among friends (Rose, 2002), which could consequently perpetuate internalizing symptoms as opposed to minimizing them (Rose et al., 2007). Similarly, in larger peer groups, intimacy can contribute to feelings of uncertainty related to whether disclosures made in private among a specific set of individuals will remain so, which can inadvertently reinforce negative cognitions and feelings (Wood et al., 2017). In this way, friendship intimacy is a double-edged sword; it has the potential to lead to favorable and unfavorable consequences.

Peer Experiences are Complex

Young adolescents are influenced by multiple relationships, settings, and contexts (Way & Silverman, 2012), with the school environment receiving most research attention (Willet et al., 1998). Importantly, school is often the social context in which youth first form friendships with

others (Ferguson et al., 2022; Ryan, 2001). Peer groups are largely formed within classrooms and research has shown that school-aged children tend to interact primarily with same-gender peers, as well as form dyadic friendships with same-gender peers (e.g., Kovacs et al., 1996; Rose et al., 2004; Rubin et al., 2006). Essentially, individual students are nested in dyadic relationships, which are nested in classrooms. As such, it is reasonable to assume that the developmental trajectory of the adolescent likely derives from factors within the individual, within their environment, and from an interaction between these factors (Bukowski & Sippola, 1998).

Given the complexity of the peer system, the means by which peer relationships can exert their effects may differ, occurring at the level of the person, dyad, or group (Rubin et al., 2015). At the dyadic level, experiences of security and care have been shown to minimize the stability of anxiety and depressive mood (Parker at al., 2015; Wood et al., 2017), while factors at the level of the group such as cohesion, have also been shown to affect behavioural outcomes (i.e., altruism) occurring at the level of the individual (van den Bos et al., 2018). A classroom or group-level characteristic similar to cohesion that is likely to influence individual behaviours and attitudes is density, an index originating from network analysis (Wasserman & Faust, 1994). Density is described as an index of how well students are connected to everyone else in the classroom, and it involves the number of possible links in a group (Lott & Lott, 1965). Keeping this in mind, it can be argued that although they are conceptually distinct, the traditional sociometric measure of peer acceptance, defined as the number of times a child is chosen as a friend by his/her peers in a nomination procedure (Cillessen & Bukowski, 2018), shares a striking similarity to the network measure of density. Specifically, both measures assess the degree to which a child has connections to other members in their group. Given this, it would be reasonable to assume that higher levels of acceptance/density may facilitate the transmission of both prosocial (e.g., helping) or antisocial

(e.g., victimization) attitudes, as well as behavioural norms and expectations from members of an existing group (e.g., collectivistic vs. individualistic values) (Ahn et al., 2010; Pardo et al., 2022; Rubin et al., 2015). Thus, members in groups are not only interconnected through their dyadic relationships, but that they also share social conventions and values, which determine what is deemed appropriate when considering within-group interactions (Rubin et al., 2015).

Conceptually then, it seems imprudent to separate influence that occurs in dyadic relationships (e.g., best friendships) from influences that occur as a result of larger groups since the two are interdependent (DeLay et al., 2021; Hinde, 1987). Due to its ability to account for the nonindependence of observations, multilevel modeling provides a powerful framework to aid researchers in examining these effects more accurately and efficiently (Kochenderfer-Ladd & Wardrop, 2001; Raudenbush & Bryk, 2002; Rubin et al., 2015).

The Present Study - Objectives and Hypotheses

In light of the research presented, the current study has two inter-connected goals. First, it sought to provide further support for the claim that positive interactions with peers can function as an antidote to anxiety by providing security- and intimacy-based experiences that limit uncertainty and promote closeness. Second, this study was also designed to build on prior support for this hypothesis at the level of the dyad by assessing the degree to which certain features at the level of the group minimize the continuity of anxiety across the academic year. Specifically, we were interested in investigating whether the well-known protective effects of security and intimacy as distinct forms of perceived friendship quality on social anxiety varied as a function of group characteristics, namely SES, and mean levels of individualism, collectivism, and acceptance/density. To accomplish this, a multilevel model approach was used. Given the nested structure of this data, our research question involved a hierarchy with three distinct levels. In this

study, variables at the lowest level (Level 1; individual) pertained to the within-person change in social anxiety scores across three time points (Time 1: T1; Time 2: T2, and Time 3: T3). Variables situated at the middle level of the hierarchy (Level 2; dyadic) were those that occurred at the level of the dyad; namely, perceived levels of security and intimacy among best friendships. Finally, at the highest level of the hierarchy (Level 3; group) were the peer group related variables, including gender, SES, and mean levels of individualism, collectivism, and acceptance/density.

Several hypotheses were proposed. First, given that uncertainty may be generally higher at the beginning of the school year, it was expected that social anxiety scores would be highest at Time 1 and then decrease over time. It was also predicted that social anxiety scores would initially be lower for children who: a) are male (see Karkavandi et al., 2022), b) from higher SES backgrounds (see Bradley & Corwyn, 2002), c) groups with collectivistic values as opposed to individualistic values (see Schreier et al., 2010), and finally, d) groups with higher levels of acceptance/density (see Aguilar-Pardo et al., 2022; Veed et al., 2019). With respect to Level-2 effects, we hypothesized that friendship security at the dyadic level would have a negative effect on the slope of social anxiety over time (see Wood et al., 2017), whereas intimacy would have a positive effect. This prediction was made in light of research which has proposed that intimate relationships involve higher levels of self-disclosure, which has the potential to increase anxiety among youth (Rose, 2002; Wood et al., 2017). Finally, it was also expected that several group-level characteristics would be implicated in the changes of social anxiety scores over time. Specifically, we anticipated that security at the level of the dyad would be particularly important for children from lower SES backgrounds and for children from highly individualistic groups. This hypothesis was put forward for two reasons. First, children from lower SES backgrounds have been shown to experience negative developmental outcomes (Duncan et al., 2016), and as such,

may likely benefit from the well-known protective effect of having a secure friendship (Persram et al., 2021; Way et al., 2005). Second, children who are members of groups that value individual achievement and advancement may also benefit from having a friend on who they can rely during times of need. It was also expected that high levels of acceptance/density in a group would likely demonstrate a positive association with intimacy and overall social anxiety levels over time. The reasoning for this final hypothesis stemmed from the idea that a group with a greater number of possible connections or links would likely have more opportunities for intimacy, and thus, self-disclosure among friendships, which may perpetuate social anxiety over time.

Method

Participants

Participants were 317 fifth and sixth grade students (174 females (54.9%), 143 males (45.1%) between the ages of 10 and 12 years of age from primary schools in Montréal, Canada and Barranquilla, Colombia. Data were collected from 19 separate classrooms (38 same-gender peer groups) from five mix-gender schools in lower-middle and upper-middle class neighbourhoods, demonstrating a broad representation of socioeconomic status. Socioeconomic status (SES) for children in Montréal was determined based on data provided by the local school commission as well as census data regarding education and median income. The majority of students from two of the three schools in Montreal were identified as lower-middle class and the majority of students at the third school were identified as upper-middle class. In Colombia, SES for each neighbourhood is evaluated on a six-level *estrato* scale (where '1' indicates very low and '6' indicates very high) by a federal government agency. One of the two participating schools in Colombia was identified as fitting *estrato* 1 and 2 neighbourhoods, whereas the other school corresponded to students from *estrato* 5 and 6 neighbourhoods.

Procedure

Ethical approval and permission were first obtained from Concordia University's Human Research Ethics Committee, followed by informed consent from the school board and the school principals of the participating institutions. Once parental consent and child assent were obtained, children completed self-report and peer assessment questionnaires at 3 separate time points; T1 at the end of September 2013, T2 at the end of November 2013, and T3 at the end of January 2014. Questionnaires were administered in English (for children in Montréal) and Spanish (for Children in Colombia) at their desks during class time using tablet computers. The translation of the items from English into Spanish underwent a three-step process. The items for the questionnaires were first created in English, and were then converted into Spanish by Colombian translators who work in the fields of psychology and education. Finally, they were back-translated into English by a separate group of translators in order to ensure that the true meaning of the items was retained during the translation process. Each child was assigned a participant ID number, which was used to ensure that all responses were kept anonymous. Laboratory members were present in each classroom during each data collection to provide help when requested by a student. If at any point a child wished to discontinue their participation, their data was discarded. There were no inclusion/exclusion criteria for this study. It is important to note that the children who did not take part in the study were not included when assessing peer data.

Measures

Level 1 Variables (Individual)

Social Anxiety. Social anxiety was assessed with 3 items, rated on a 5-point scale by the participants at three time points (T1, T2 and T3). The individual items as well as the descriptive statistics are provided in Table 3. For each participant, mean social anxiety scores were computed

at each time. Higher self-reported scores indicated higher levels of social anxiety. Measures of social anxiety were reliable at T1 (Cronbach's α = .80), T2 (Cronbach's α = .86), and T3 (Cronbach's α = .85).

Level 2 Variables (Dyadic)

Friendship Quality. To assess specific aspects of friendship quality at Time 1, participants rated items designed to assess perceived levels of security and intimacy on a five-point scale. The individual items as well as the descriptive statistics for each scale are provided in Table 3. Higher scores indicated greater levels of security and intimacy.

Level 3 Variables (Group)

In order to assess levels of individualism, collectivism, acceptance/density and SES across groups, the participants' classroom-based same-gender peer group was identified as the primary reference group. Group means for each variable were computed at Time 1 and assigned to each participant, given their primary reference group.

Gender. A binary index of gender was used indicating whether the peer group included girls (coded as 1) or boys (coded as 2). There were 21 groups of girls (55.3%) and 17 groups of boys (44.7%).

Individualism & Collectivism. Participants used a five-point scale with endpoints never (1) and almost always (5) to rate items designed to assess levels of individualism and collectivism; see Table 3. Higher scores indicated higher levels of individualism and collectivism.

Socioeconomic Status (SES). In this study, SES was not directly measured. In Montréal, SES was based on data provided by the local school commission as well as census data regarding education and median income. In Colombia, SES for each neighbourhood is evaluated on a six-

level *estrato* scale (where '1' indicates very low and '6' indicates very high) by a federal government agency. In our dataset, SES was coded dichotomously; where a score of '1' represented low SES groups (n = 16, 42.1%), and a score of '2' represented higher SES groups (n = 22; 57.9%).

Acceptance/Density. In order to obtain an index of the level of acceptance/density among groups, group mean scores for measures of acceptance and density at Time 1 were standardized and combined. The rationale for combining both scores is based on two principal ideas. First, the Pearson correlation between the measure of acceptance and density was found to be relatively high, r = 0.78). Second, the reason for this high correlation between both measures is that the two measures are nearly identical in that both measures assess the number of connections in a classroom (described earlier).

First, participating children completed a rating-based sociometric measure. Specifically, every child was asked to rate how much they liked each of their peers within their reference group using a five-point Likert scale (where '1' refers to "do not like" and '5' refers to "like very much"). The number of times a child received the highest rating (5) from his/her classroom peers was combined with the number of times a child was named as a friend by his/her peers to calculate an acceptance score for each child. Acceptance scores were adjusted from classroom size using a regression-based procedure (see Velasquez et al., 2013). Higher scores referred to greater liking, whereas lower scores suggested that the child was not well-liked. Combining rating and nomination measures of acceptance has been shown to create a reliable aggregated measure (Asher & Dodge, 1985; Bukowski et al. 2000).

To compute an index of classroom density for each of the 19 classrooms, the number of existing connections between group members was divided by the number of most possible

connections for each classroom. Mean level of acceptance/density across classrooms were 0.00 (*SD* = .95).

Analytic Approach

Multilevel modeling conducted with Hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) was used to assess the effects at three different levels of the hierarchical model. At Level-1 (individual level), time was identified as the predictor of social anxiety scores for each participant across 3 time points. At Level-2 (dyadic level), analyses involved assessing how perceptions of security and intimacy at Time 1 affect changes in the intercept and slope of individual social anxiety scores over time. Level-3 (group level) analyses assessed the degree to which group variables at Time 1 such as gender, SES, and mean levels of individualism, collectivism, and acceptance/density further influenced social anxiety trajectories over time.

Results

Multilevel analyses were conducted with HLM (Raudenbush & Bryk, 2002). The outcome variable at Level 1 was the level of social anxiety for each participant across the three times (T1, T2, and T3). Each person had a total of three scores as the dependent measures at Level 1. The Level 1 predictors were initial levels of social anxiety, time, and the interaction between social anxiety and time.

The Unconditional Model

First, an unconditional model was run, which included social anxiety as an outcome, to estimate the within-person and between person variance needed to compute an intraclass correlation coefficient (ICC). This model produced three specific statistics of interest; (1) the measure of tau (t) indicating the amount of within-person variance, sigma squared (s^2), indicating the amount of between-person variance, and the Chi-square value ($\chi 2$), for the null hypothesis test

that the intercept was a fixed effect. In this analysis, the observed values were .64 for t, .42 for s^2 and .60 for the ICC. Thus, the ICC value indicates that 60% of the total variance in social anxiety scores was between persons, whereas the remaining 40% of the variance in social anxiety was within persons. The $\chi 2$ value for the test of whether the intercept was a fixed effect indicated that it could be treated as a random effect ($\chi 2_{(279)} = 1564.86$, $p < .001$), indicating variation across groups.

Level 1 Model- Effect of Time

Individual growth curve trajectories comprised the Level 1 model to estimate the average within-person change in social anxiety scores over time. Random effects were estimated for both the intercept (initial level of social anxiety) and the slope (rate of change) for each participant. Two Level-1 variables were observed to account for variability in social anxiety scores. They were: the intercept (unstandardized coefficient = 2.42 ($t = 31.31$, $p < .01$), and time (unstandardized coefficient = -.16 ($t = -2.21$, $p < .05$). The negative effect of time indicates that social anxiety scores decreased over time.

Level 2 Model- Effect of Friendship

In the next model, the Level 2 variables of friendship security and intimacy (measured at T1), were used to account for the variability in the Level 1 values for the intercept and the slope for the effect of time. Results demonstrated that security accounted for variability in the intercept (unstandardized coefficient = -.28 ($t = -4.34$, $p < .001$), but not in the slope (unstandardized coefficient = -.02 ($t = -.42$, $p = .68$). The negative effect observed for security indicates that children whose friendships were characterized by higher levels of security had lower scores on the intercept. Conversely, intimacy did not account for variability in the intercept (unstandardized

coefficient = -.01 (t = -.16, p = .88) or the slope (unstandardized coefficient = .04 (t = 1.25, p = .22) of social anxiety scores.

Level 3 Model- Group Effects

In the final model, the group measures of SES, individualism, collectivism, acceptance/density and gender were used to account for (a) variability in the effects observed at Level 1 for the intercept and for the slope for the effect of time on social anxiety scores and (b) variability in the effects of the level 2 variables on the intercept and slope observed at Level 1.

Effects on the Intercept

Differences in the intercept were observed as a function of four Level 3 variables: gender (unstandardized coefficient = .46 (t = 4.90, p < .001), SES (unstandardized coefficient = -0.35 (t = -3.54, p < .01), collectivism (unstandardized coefficient = -.44 (t = -3.01, p < .05), and acceptance/density (unstandardized coefficient = -0.21 (t = -3.93, p < .01). The Level 3 effect of individualism on the intercept was statistically non-significant (unstandardized coefficient = .16 (t = 0.94, p = .36). These findings indicate that levels of social anxiety were initially higher for girls, for children from lower-SES classrooms, for children in groups with low levels of collectivism, and for children in groups with low levels of acceptance/density. When assessing the effect of friendship security on the intercept as a function of Level 3 variables, no differences were observed across groups, indicating that the effect of the measure of security did not account for variability across the Level 3 units. The Level 2 effect of intimacy on the intercept, however, was moderated by one Level 3 effect, namely that of acceptance/density (unstandardized coefficient = .23 (t = 4.20, p < .001).

Effects on the Slope

With regards to the effects of time, changes in the slope of social anxiety scores were only observed as a function of group level of collectivism (unstandardized coefficient = .24 (t = 3.25, p < .01). This indicates that decreases in social anxiety are smaller for those in groups with high levels of collectivism. Findings also revealed that the effect of friendship security on the slope of social anxiety varied as a function of three Level 3 variables: individualism (unstandardized coefficient = -.29 (t = -2.40, p < .05), collectivism (unstandardized coefficient = .35 (t = 3.65, p < .01), and acceptance/density (unstandardized coefficient = -.10 (t = -2.75, p < .05). The effect of friendship security on the slope as a function of group SES was found to be statistically non-significant (unstandardized coefficient = .08 (t = .87, p = .39). These findings indicate that both individualism and acceptance/density strengthen the negative effect of security over time, whereas collectivism weakens the negative effect of security (e.g., makes the effect of security less negative).

Finally, the effect of friendship intimacy on the slope of social anxiety was observed to vary as a function of SES (unstandardized coefficient = .18 (t = 2.89, p < .01), and individualism (unstandardized coefficient = -.24 (t = -2.33, p < .05). The effects of friendship intimacy on the slope as a function of group collectivism (unstandardized coefficient = -.10 (t = -.81, p = .43). and acceptance/density (unstandardized coefficient = .01 (t = .33, p = .75) were found to be statistically non-significant. These findings indicate that the effect of friendship intimacy on social anxiety over time is more negative for children from lower SES groups, and for children in groups with higher levels of individualism.

Simple Slope Analyses

The first step of the process of clarifying the observed interactions was to use the observed coefficients to create predicted scores. These predicted values were then used to create slopes to be used in figures. The values use to create the predicted scores were either the binary scores on the categorical measure of SES or the values equal to 1 standard deviation above or below the grand mean on the continuous measures (i.e., friendship security and intimacy, and group individualism, collectivism, acceptance/density). The slopes created with the predicted scores are depicted in Figures 1 through 5.

As noted earlier, the effect of friendship security on the change in social anxiety over time was moderated by three statistically significant level-3 effects: (1) individualism, (2) collectivism, and (3) acceptance/density.

For the effect of individualism, no changes were observed in social anxiety scores for individuals who were in groups with high levels of individualism and who had low levels of security. In contrast, socially anxiety scores decreased for children in the other three conditions. Specifically, decreases in social anxiety were observed for groups with low levels of individualism and low levels of security, low levels of individualism and high levels of security, and high levels of individualism and high levels of security. The effect for groups characterized by low levels of individualism and high levels of security was weakest. Simple slope analyses revealed that the change in social anxiety scores across time for children in groups characterized by low levels of individualism and low levels of security was significant (t = -4.44), as was the change in anxiety for children in groups with high levels of individualism and high levels of security (t = -4.59); see Figure 1.

For the effect of collectivism, anxiety scores were observed to increase over time for children in groups with high levels of collectivism and high levels of security. In contrast, statistically significant decreases in social anxiety scores were observed for children in the other three conditions: children in groups with low levels of collectivism and low levels of security (t = -2.11), low levels of collectivism and high levels of security (t = -7.37), and high levels of collectivism and low levels of security (t = -2.50). The effect for groups characterized by low levels of collectivism and high levels of security was strongest; see Figure 2.

For the effect of acceptance/density, no changes were observed in social anxiety scores for individuals who were in groups with low levels of acceptance/density and high levels of security, and high levels of acceptance/density and low levels of security. In contrast, statistically significant decreases in social anxiety scores were observed for children in the other two conditions: children in groups with low levels of acceptance/density and low levels of security (t = -4.14), and children in groups with high levels of acceptance/density and high levels of security (t = -4.78); see Figure 3.

Lastly, the effect of friendship intimacy on the change in social anxiety over time was moderated by two statistically significant level-3 effects: (1) SES and (2) individualism.

For the effect of SES, no changes were observed in social anxiety scores for individuals who were in groups characterized by low levels of SES and low levels of intimacy, and high levels of SES and high levels of intimacy. In contrast, statistically significant decreases in social anxiety scores were observed for children in the other two conditions: children in lower SES groups with high levels of intimacy was significant (t = -2.94), and children in higher SES groups with low levels of intimacy (t = -8.13); see Figure 4.

For the effect of individualism, social anxiety scores were observed to increase over time for children in groups with low levels of individualism and high levels of intimacy. In contrast, social anxiety scores decreased for children in the other three conditions: children in groups high levels of individualism and high levels of intimacy, low levels of individualism and low levels of intimacy, and high levels of individualism and low levels of intimacy. Simple slope analyses revealed that the change in social anxiety scores across time was significant for children in group with low levels of individualism and low levels of intimacy (t = -6.69), and high levels of individualism and high levels of intimacy (t = -3.69). The effect for groups characterized by low levels of individualism and low levels of intimacy was strongest; see Figure 5.

Discussion

The purpose of the present study was to examine the degree to which the effects of friendship security and intimacy on scores of social anxiety varied as a function of various contextual factors, namely SES, and mean levels of individualism, collectivism and acceptance/density across same-gender peer groups.

Findings from this study add to the existing research on the trajectory of anxiety across the school year, and provide more evidence for the protective function of friendship with respect to internalizing symptoms. As predicted, our analyses demonstrated that social anxiety scores decreased from Time 1 to Time 3. This finding is likely due to the increased amount of certainty that occurs as the school year progresses as children become more familiar with their environments. With regards to the Level 2 friendship effects, friendship security accounted for variability in the intercept, but not in the slope of social anxiety scores, suggesting that children whose friendships were characterized by higher levels of security had lower scores on the intercept. Essentially, this means that children whose dyadic friendships have high levels of security

demonstrate lower levels of social anxiety to begin with compared to others. In contrast, intimacy did not account for variability in the intercept or the slope of social anxiety scores over time. It is important to note, however, that although intimacy did not account for variability in the slope of social anxiety scores, the observed effect was positive, suggesting that intimacy leads to an increase in social anxiety across time. The findings that friendship security serves a protection function against anxiety, whereas intimacy may exacerbate anxiety over time have both been shown before (Bagwell & Bukowski, 2018; Parker et al., 2015; Rose, 2002; Rose et al., 2007; Wood et al., 2017).

Concerning the effects of the group-level variables on the intercept of social anxiety, our initial hypotheses were supported. Specifically, social anxiety scores were observed to be higher for: girls, children from lower-SES groups, children in groups with low levels of collectivism, and children in groups with low levels of acceptance/density. These findings are unsurprising given what has been previously reported in the literature (see Aguilar-Pardo et al., 2022; Bradley & Corwyn, 2002; Karkavandi et al., 2022; Schreier et al., 2010; Veed et al., 2019).

Moving to the effects of time, changes in the slope of social anxiety scores were only observed as a function of group level of collectivism, indicating that the decrease in social anxiety levels was smaller for those in groups with high levels of collectivism. It is possible that this unexpected finding was observed since group level of collectivism exerted a strong effect on the intercept of social anxiety, exerting a potential floor effect.

Our analyses also revealed that the effect of friendship security on the slope of social anxiety varied as a function of group level of individualism, collectivism, and acceptance/density. Specifically, individualism and acceptance/density were both found to strengthen the negative effect of friendship security over time. By examining Figure 1 which illustrates the effect of group-

level individualism, it can be seen that social anxiety scores were maintained over time for children in groups with high levels of individualism and low levels of security. In contrast, levels of social anxiety for children in highly individualistic groups but with high levels of security significantly decreased over time to the lowest level compared to other groups. With respect to group level of collectivism, results showed that among groups with low levels of collectivism, children with low levels of security maintained the highest levels of anxiety over time compared to other groups, whereas those with high levels of security demonstrated the lowest overall levels of social anxiety across time. These findings support our initial hypothesis and suggest that for children who are in groups that value individual advancement and achievement, having a secure friendship is particularly important. This may be due to the fact that among groups where everyone is looking out for themselves, knowing that you have a friend on whom you can consistently rely on (outside of your group) and that this person will be there for you for external support and reassurance, is crucial for minimizing anxiety during a period in the lifespan that is characterized by several simultaneous and significant changes (Ferguson et al., 2022). Given this, it is unsurprising that in our analyses the effect of friendship security was weaker among groups with high levels of collectivism (e.g., groups that value interdependency, collaboration, social harmony).

Moreover, findings from our analyses which examined the effects of acceptance/density and security on the slope of anxiety over time revealed that among groups with high levels of acceptance/density, anxiety scores remained stable for the low security group whereas they decreased for the high security group. Perhaps being in a group with a high level of acceptance/density (e.g., interconnectedness) among members combined with having a highly secure friendship provides the maximum amount of certainty and reassurance possible in social circumstances, which functions to reduce social anxiety. Surprisingly, our prediction that the effect

of security on the slope of social anxiety would be important for children from lower SES groups was not supported.

Analyses also revealed some interesting findings with respect to the effect of friendship intimacy. Specifically, the effect of intimacy on the slope of social anxiety was observed to vary as a function of group SES and individualism. It was demonstrated that the effect of intimacy on social anxiety scores over time was especially important for children from lower SES groups. In particular, social anxiety scores decreased for children with high levels of intimacy, whereas anxiety levels remained high over time for the low intimacy group. The finding that friendship intimacy is an important component of close friendships among early adolescents from lower SES groups has been reported before (Way et al., 2005). Given that children from lower SES backgrounds are more likely to experience adverse life events, negative developmental outcomes and lower levels of parental support (Duncan et al., 2016), having a close friend with whom one can share and process difficult experiences and negative emotional states with may be particularly therapeutic.

Regarding individualism, findings showed that among groups with high levels of individualism, high levels of intimacy are important as it serves to decrease social anxiety scores over time. In comparison, for groups with low levels of individualism, low levels of intimacy reduced levels of social anxiety across time, whereas social anxiety was maintained for those with high friendship intimacy. To understand the latter finding, one might consider the opposite of low levels of individualism, that is, higher collectivism. Given that collectivistic attitudes promote collaboration, higher levels of intimacy among a group that is heavily focused on working as a team may facilitate the exchange of personal information, which has the potential to increase anxiety. A similar explanation is provided for the effect of intimacy on the slope of anxiety as a

function of acceptance/density. Although this effect was found to be statistically non-significant, the effect was observed to be positive, which supports our initial expectation. This provides support for the well-known finding in the literature that intimacy among friends likely promotes increased levels of co-rumination (Rose, 2002). A consequence of being a part of a group where children are highly connected is the possibility that private information disclosed among best friends has the potential to be shared more widely and rapidly with others, which can exacerbate anxiety over time (Aguilar-Pardo et al., 2002).

Overall, the findings from the present study suggest that the effects of friendship on the trajectory of social anxiety scores among youth over time are highly dependent upon the context in which they occur.

Limitations and Implications

Although this study has numerous strengths, there are a few limitations that should be considered. First, the use of a longitudinal design allowed for the assessment of how social anxiety scores changed across the school year as a function of friendship security and intimacy, and several classroom-level variables. However, security and intimacy were only measured at one time point. As a result, the stability of both of these important friendship features over time was not assessed. Given this, future studies should consider the possibility that levels of friendship security and intimacy can fluctuate across the school year as a result of experiences with one's peers, and the implications this could potentially have on levels of anxiety. Nonetheless, it has been shown that friendships that are high in relationship quality are more likely to persist over time (Berndt, 2004).

Second, from a design perspective, although three separate time points were used in this study, data collection at Time 3 occurred at the end of January, which might be considered the mid-point in the academic school year, which typically begins at the end of August and ends in

mid-June. Going forward, future longitudinal research involving early adolescents and their classroom experiences would be better served to implement a design in which there are greater intervals between time points to ensure that dynamics present among peers toward the end of the school year are indeed captured. Finally, Study 1 demonstrated the advantages of using a burst-design methodology (e.g., improved measurement stability and internal consistency) when measuring young adolescents' internalizing symptoms. Despite this, the present study employed a longitudinal framework with a single data collection point (as opposed to multiple) at each wave of assessment. Although our measure of social anxiety demonstrated adequate levels of internal consistency at each of the three time points, it is recommended that future studies implement a burst-design methodology to prevent the potential influence of daily environmental experiences on social anxiety levels at the time of assessment. Assessing the influence of friendship and the larger classroom context on the continuity of other forms of anxiety (e.g., test) and internalizing symptoms (e.g., depressed affect) should also be an important avenue for future research.

Nevertheless, these limitations should not overshadow the important strengths and implications of this study. Our findings reinforced the existing literature on the protective function of security-based experiences at the dyadic level and extended it by accounting for the added influence of the overall group or context in which dyadic experiences are embedded. By incorporating a three-level model of analysis, we were able to conclude that provisions at the group-level can also serve as a source of emotion regulation for early adolescents.

Taken together, the present research has several practical implications. With respect to primary prevention, our findings demonstrate that children who are part of certain groups may be predisposed to having higher baseline levels of social anxiety compared to children belonging to other groups. Given this, it may be particularly important to monitor anxiety in these groups of

children who may particularly benefit from early intervention efforts. It may also be imperative for educators to promote positive, supportive, and collaborative classroom climates in the first few weeks of school to help minimize levels of anxiety as much as possible since they are typically elevated at the onset of a new academic year. Consistent with previous research, results from this study provide further support for the importance of educating youth on choosing their friends wisely; that is, teaching young adolescents about the advantages of establishing and maintaining friendships characterized by high levels of security and intimacy, which can help them be better able to identify friends that can help minimize their anxious symptoms. Finally, perhaps the most novel finding of the current study is that certain group features have the potential to compensate for the protective features that may be lacking among dyadic friendships, or alternatively, can complement what already exists between two close friends, further enhancing the benefits of security and intimacy to promote overall well-being and positive adjustment. These results are encouraging for children whose friendships are lacking in these features of positive friendship quality as they have the potential to receive some degree of protection from internalizing symptoms from the larger peer group they are a part of.

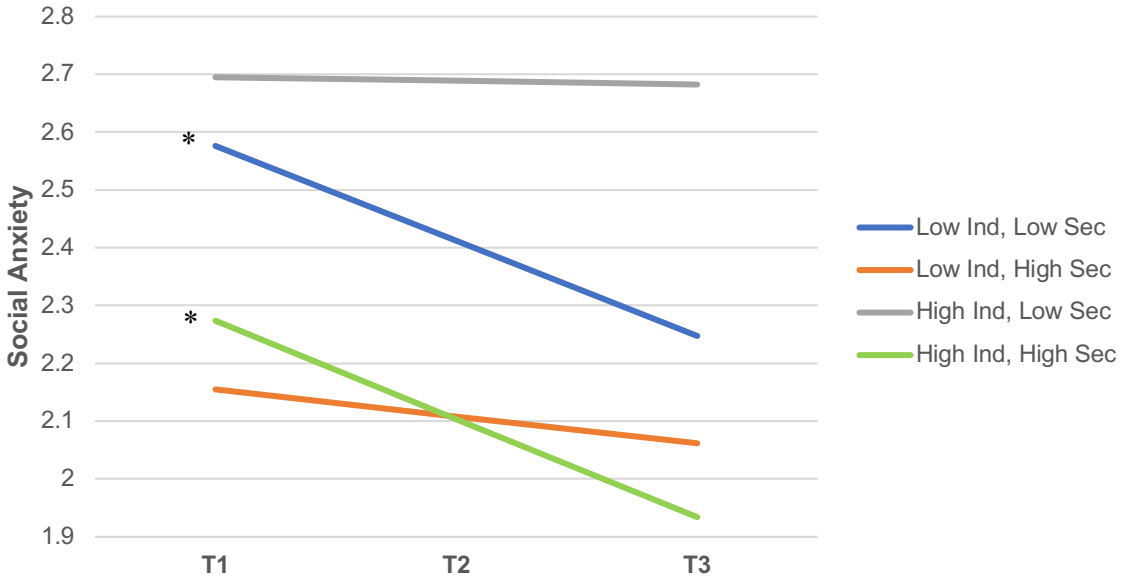
Table 3.

Descriptive Statistics of Individual, Dyadic, and Group- Level Variables

Items	Cronbach's α	*M* (SD)
Social Anxiety (T1, T2, T3)	.84	2.31 (1.07)
I can feel nervous when I am with other kids in my class		
I worry about what other people might think of me		
Sometimes I am afraid that some people in my class might make fun of me		
Friendship Security (T1)	.83	4.18 (.74)
I am sure that this friendship will last for a long time		
If my friend or I do something that bothers the other one of us, we can make up easily		
If my friend and I have a fight or argument we can say "I am sorry" and everything will be alright		
Friendship Intimacy (T1)	.85	3.73 (1.00)
I can talk to my friend about everything that is on my mind		
If I have a problem at school or at home, I can talk to my friend about it		
If there is something bothering me, I can tell my friend about it even if it is something I cannot tell to other people		
Individualism (T1)	.48	3.32 (.33)
I like to depend on myself more than others		
I try to rely on myself		
I like to make my own decisions rather than listen to others		
Collectivism (T1)	.58	3.66 (.33)
I care about what others think before I make a decision		
Before I do something, I think about how it would affect others		
It is everybody's job to make sure that others are doing OK		

Figure 1.

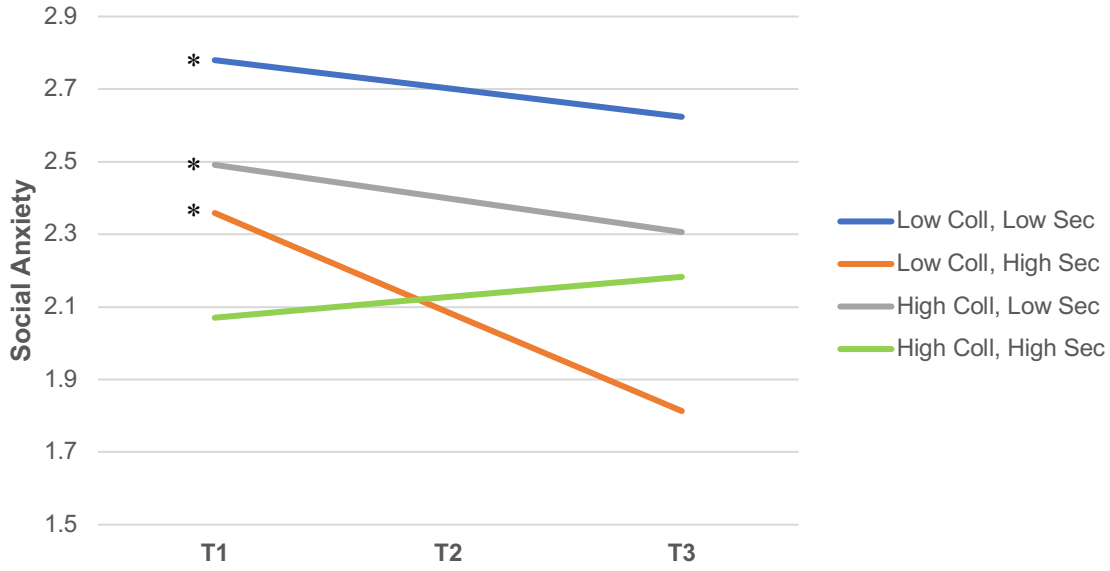
Effect of Individualism and Security on Time



Note. * t > +/-1.65

Figure 2.

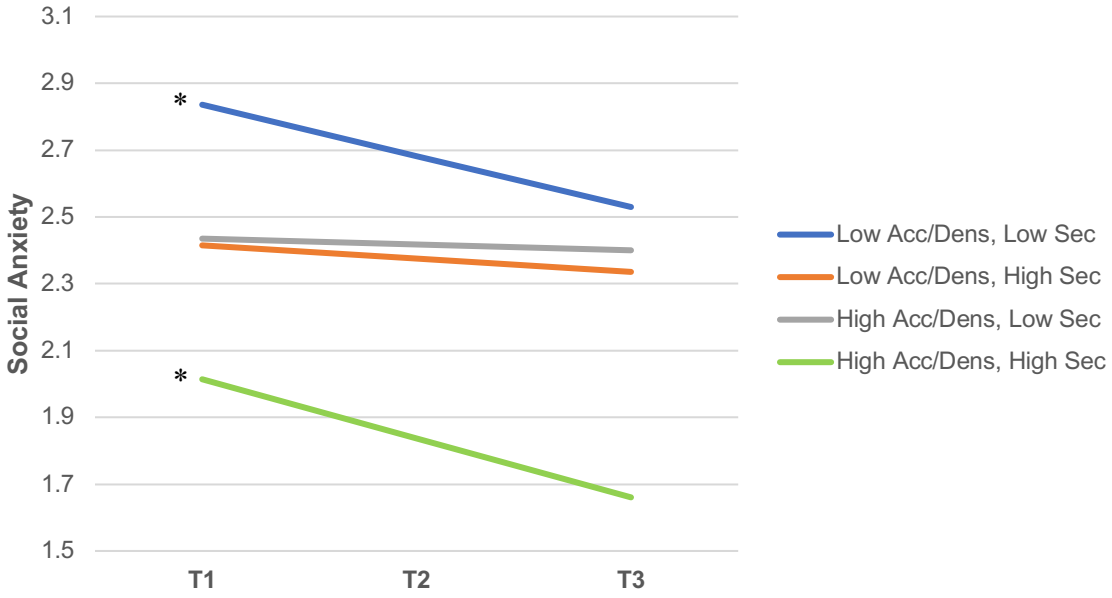
Effect of Collectivism and Security on Time



Note. * t > +/-1.65

Figure 3.

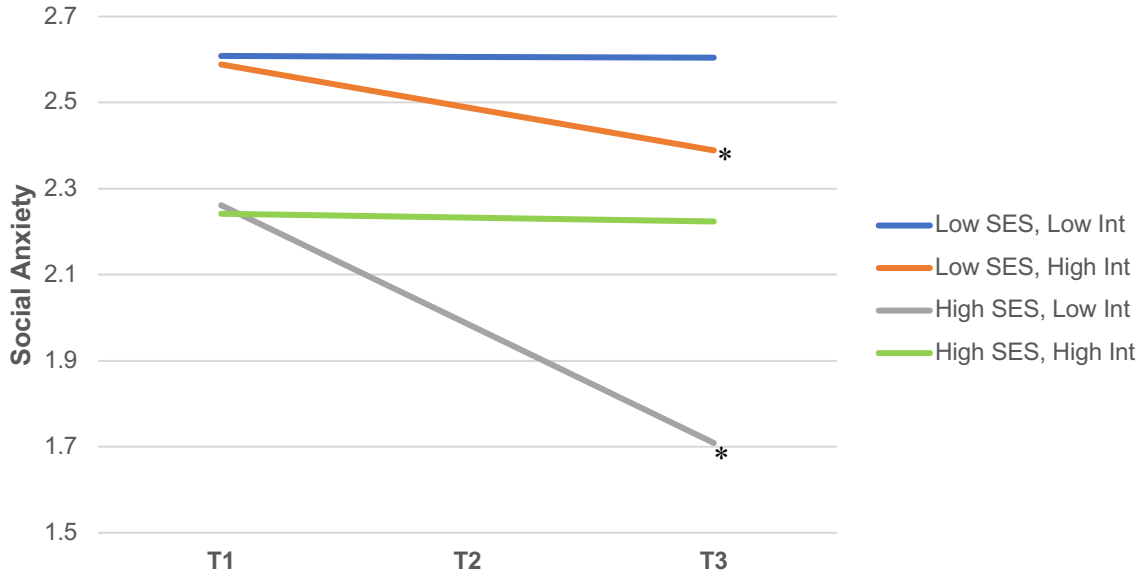
Effect of Acceptance/Density and Security on Time



Note. * t > +/-1.65

Figure 4.

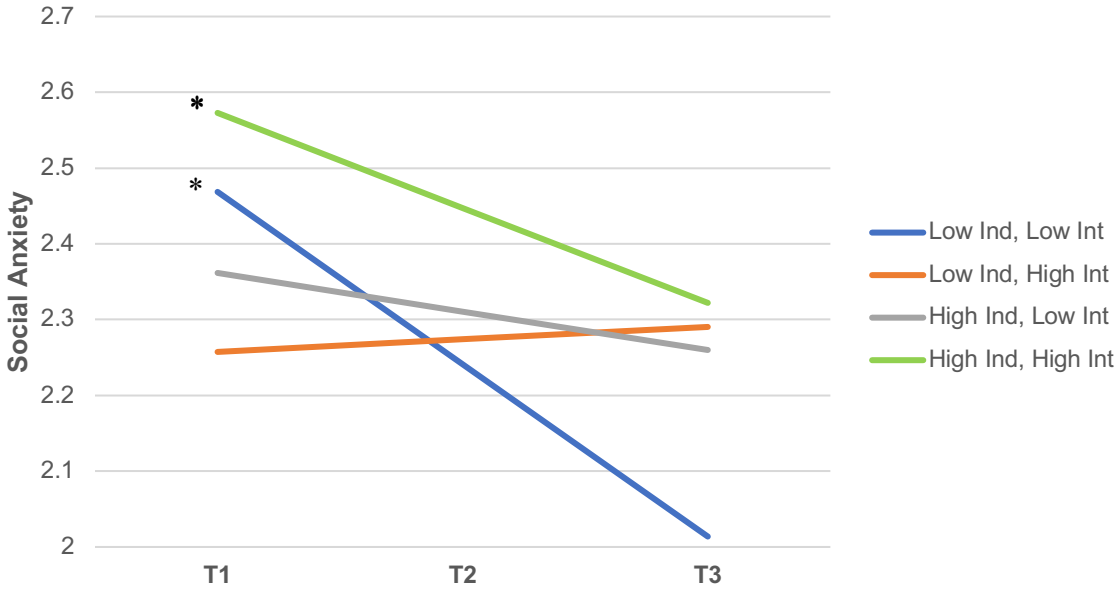
Effect of SES and Intimacy on Time



Note. * t > +/-1.65

Figure 5.

Effect of Individualism and Intimacy on Time



Note. * t > +/-1.65

Study 3: Variations in Perceived and Actual Social Acceptance as a Function of Depressed Affect

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Abstract

Social acceptance plays a central role in theories of depression, where depressive symptoms tend to be higher among children who are reported as being disliked and rejected by their peers. While objective sociometric measures of likeability and acceptance within the peer group have been correlated with measures of psychological well-being, the important contribution of children's perceived social competence has often been overlooked. Importantly, perceptions of the self are thought to be formed within the context of peer relations. However, perceptual biases are known to be distinctive of experiences of depressed affect. Thus, it is possible that accurate awareness of one's experiences with peers may be impeded by a person's level of depressed affect. As such, the present study sought to investigate the degree to which the association between a measure of peer acceptance and a measure of self-perceptions of social competence was moderated by a measure of depressed affect. Fifth and sixth grade students took part in the study and completed self-report measures of depressed affect and perceived social competence, as well as a sociometric measure of acceptance at two times. Findings revealed support for our initial hypothesis, in that higher levels of depressed affect appeared to desensitize youth to actual levels of peer acceptance.

Variations in Perceived and Actual Social Acceptance as a Function of Depressed Affect

The formation of a healthy self-concept is a central developmental task for older school-age children (Kaman et al., 2021; La Greca & Harrison, 2005; Marcone et al., 2021). Entering early adolescence with a positive view of the self is an important achievement that prepares individuals for subsequent challenges of later adolescent periods (Raufelder et al., 2021). Research on the development of the self has typically focused on the effects of actual experiences, such as experiences in the peer group. In these studies, measures of experience are typically used as predictors of concurrent or prospective measures of the self. A premise of these studies is that the self derives largely from experience. This premise is predicated on the assumptions that individuals are aware of their experiences and that this awareness seems to be consistent across individuals. However, there is reason to be hesitant about these assumptions. A main reason for this hesitancy is the likelihood that awareness of experiences may be impeded by person-related characteristics that are linked to other aspects of a person's functioning. One impediment to accurate awareness of one's experiences may be depressed affect. Depressed affect is known to act as a negative mental filter that overlooks positive experiences (Beck, 1976). In the present study, we assessed the degree to which the association between a measure of peer acceptance and a measure of self-perceptions of social competence was moderated by a measure of depressed affect.

This study has two conceptual points of departure and one empirical point of departure. The first conceptual point of departure has been alluded to already. Theory about the formation of the self has emphasized processes of internalization. Beginning with the sociologists known as the symbolic interactionists, the formation of the self has been conceived of as an interpretive process in which persons perceive themselves according to how they believe they are perceived by others

(Cooley, 1902; Mead, 1934). A similar perspective is reflected in Sullivan's (1954) idea that the self was formed within the context of peer relations. Sullivan proposed that relationships with co-equals in early adolescence provide opportunities for self-validation that promote an enduring sense of a positive self. Sullivan's claim about peer relations and the formation of the self was very specific. He argued that the critical feature of peer experiences is validation, specifically that peer relations affect the formation of the self by providing experiences that either confirm or disconfirm its value. In this way, the evaluative self comes from the experiences of validation and security by peers. According to this view, the effects of experiences such as companionship and intimacy on well-being are mediated by validity and security.

The empirical point of departure is the observation that the association between measures of peer acceptance and measures of the self-perception of well-being, such as measures of self-esteem, is, at best, of medium size. Studies conducted with older school-age children and young adolescents reveal correlations that are in the range between .25 and .35 or lower (Birkeland et al., 2014; Bishop & Inderbitzen, 1996; Bukowski & Newcomb, 1984; Kingery et al., 2011). Similar findings have been reported in studies conducted with adults. Meta analyses of findings from studies that assessed the associations between measures of social relations with peers and measures of self-perceptions of well-being in adult samples revealed overall effects sizes of no more than .10 (e.g., Harris & Orth, 2020). The size of the associations between these measures are likely affected by multiple factors. The overall modest size of the association between measures of experience and measures of the self indicates that the effects of experience are less than direct.

A second conceptual point of departure follows from the first and from the empirical point of departure. It concerns the functioning of perceptual biases that are known to be distinctive features of experiences of depressed affect. Specifically, it is known that a key component of

depressed affect is a pervasive negative cognitive style that becomes both habitual and automatic, and one that is associated with biases across various stages of information processing including attention, interpretation, and memory (Kircanski et al., 2012). Importantly, individuals who are high in depressed affect often show a negative interpretation bias when faced with ambiguous scenarios, which persists despite new, positive information (Steiger et al., 2014). These biases can function as a negative filter that reduces attention to positive experiences and, as a consequence, reduces their effects on self-perceptions of well-being (Epkins & Seegan, 2015). As a result, adolescents with depressed affect may be more likely to internalize negative feedback from ambiguous social interactions with their peers, as well as overlook positive feedback and experiences, or overgeneralize a lack of success in one specific task to being globally incompetent and incapable of success (Steiger et al., 2014).

As such, it would be reasonable to assume that for adolescents with a negative cognitive bias and thus, a negative cognitive representation of their peer relationships, a discrepancy would exist between their actual (objective) and perceived (subjective) levels of acceptance or social competence. Prior research indicates that children's perceptions of their social competence are only moderately correlated with objective measures of competence (Harter, 1985). While the importance of self-perceived competence has been supported by past research (Caldwell et al., 2004; Cole et al., 1998; Zimmer-Gembeck et al., 2007), few studies exist that have investigated the degree to which depressed affect may contribute to distorted or discrepant perceptions of one's level of peer acceptance in adolescence.

The current longitudinal study examined whether depressed affect minimizes the association between an objective measure of peer acceptance and a subsequent measure of self-perceived social competence/acceptance in a sample of older school-age children. The specific

hypothesis of the study was that a measure of depressed affect at an initial time would moderate the association between a measure of peer acceptance at this same time and a measure of self-perceived positive social competence/acceptance at a later time, after the effects of the perceived social functioning at the first time had been accounted for in the analysis. It was expected that the slope for the association between initial peer acceptance and subsequent self-perceived positive social competence/acceptance would be steeper for children who had low scores on a measure of depressed affect than for children who had high scores on this measure.

Method

Participants

Fifth and sixth grade students (N = 306, 53.9% females, 46.1% male) with ages ranging from 10 to 12 years from Barranquilla, Colombia (n = 169; 55.2%) and Montréal, Canada (n = 137; 44.8%) took part in the study and represented over 90% of the potential pool of participants. Data were collected from 11 separate classrooms from five mixed-gender schools in lower-middle (51%) and upper-middle (49%) class neighborhoods. The participation rate per classroom was high (M = 89%, range = 75% - 100%).

Procedure

Ethical approval was first received from the affiliated universities' Human Research and Ethics Committee, followed by informed consent from the school board and the school principals of the participating institutions. Children were then recruited via classroom visits by members of the research team, and an active consent procedure was used to obtain parental permission. Participants completed questionnaires at their desks during class time using tablet computers at two times across the school year. Using a burst design format (Persram et al., 2021) two back-to-back assessments were made within each of the two times. Within each time, there were two

assessments conducted as bursts (Persram et al., 2021). The two bursts in each wave were separated by a one-week interval. Time 1 (T1) occurred in the third month of the school year. Time 2 (T2) occurred approximately 8 weeks later. Trained members of the research team were present in the classrooms during each data collection. There were no inclusion/exclusion criteria unless participants wished to withdraw their consent, in which case their data were removed. For all Spanish-speaking participants, all relevant documents (e.g., consent forms) and items were translated and back-translated by native Spanish speakers who were also fluent in English to ensure proper translation and Spanish dialect.

Measures

Self-Assessments

Depressed Affect. At each of the four assessment times (two bursts at each wave of assessment), participants responded to three self-report items designed to assess feelings of depressed affect: (e.g., "Sometimes I feel unhappy", "Sometimes I feel sad", and "Sometimes I feel lonely". Participants were asked to rate each item on a 5-point Likert scale, ranging from 1 ('*never true*') to 5 ('*always true*'). Higher scores indicated greater levels of depressed affect. Cronbach's alpha was high at both times for the measure of depressed affect (T1 $\alpha = .85$; T2 $\alpha = .85$). Two mean scores were computed for each participant by combining their scores from burst 1 and burst 2 within each wave of assessment (see Table 1 for a summary of the descriptive statistics).

Perceived Social Competence. At Time 1 and Time 2, children completed one subscale of the revised version of the Harter (1982) Perceived Competence Scale for Children. The subscale measured positive aspects of social competence. As described earlier, perceived social competence was taken as a proxy of perceived social acceptance. Four items were used to assess positive social

competence (e.g., “I know how to get along well with others”, “It’s easy for me to make friends”, “I have a lot of friends”, and “Most kids in my class like being with me”. Participants were asked to indicate how well each item described them, using a 5-point Likert scale, ranging from 1 (‘*really disagree*) to 5 (‘*really agree*’). Cronbach’s alpha was high at both times (T1 α = .82; T2 α = .83; see Table 1).

Sociometric Assessments

Peer Acceptance. Peer acceptance was measured with two different techniques in each of the two bursts at Time 1 (Bukowski et al., 2012). The two techniques used in each of the two bursts at Time 1 were (a) an unlimited choice nomination procedure in which children identified the participating same-gender peers whom they perceived to be their friends, and (b) a procedure that used a rating scale format. With the nomination measure, participants identified the same-gender peers whom they perceived to be their first best friend, their second-best friend, and their third best friend, and any other same-gender peers whom they perceived to be a friend. A nomination-based acceptance score was created for each participant by computing the number of times the child was chosen as a perceived friend by participating same-gender peers. With the procedure that used a rating scale format, each participant used a five-point scale to rate how much they liked each of their participating same-gender classroom peers. A score of “1” meant “*Do not like*” and “5” meant “*Like a lot*”. The rating scale-based measure of acceptance was the number of times the child received a rating of “5” from same-gender peers. The procedures described by Velasquez and colleagues (2012) were used to correct these measures of acceptance for potential biases that may result from between-classroom differences in the number of participating same-gender peers. An overall acceptance measure was created by computing a mean of the two nomination-based measures of acceptance and the two rating-based measures of acceptance. Combining rating and

nomination measures of acceptance has been shown to create a reliable aggregated measure (Bukowski et al. 2000; Persram et al., 2021). The aggregated score created with these four measures of acceptance was observed to be reliable ($\alpha = .80$).

Results

The data were analyzed using a hierarchical regression analysis. Time 2 perceived social competence was used as the outcome variable and four Time 1 measures were used as predictors (i.e., the aggregated acceptance score, the perceived positive social functioning measure, the measure of depressed affect, and the interaction between the depressed affect and peer acceptance measures). Table 2 presents the means and standard deviations of all measures.

First, correlations between the outcome and predictor variables were computed. The correlations of all variables are shown in Table 3. All correlations were found to be statistically significant, except for the correlations between the interaction term (depressed affect x T1 actual acceptance) and the Time 1 and Time 2 measures of perceived social acceptance. Interestingly, the correlations found between the measures of perceived social competence (at T1 and T2) and the Time 1 measure of actual acceptance were weak (0.23 and 0.20, respectively).

The sociometric measure of acceptance at T1 and the perceived social competence measure at T1 were entered on the first step and were found to be statistically significant predictors of T2 perceived social competence, $F(2, 303) = 64.03$, $p < 0.001$, accounting for 29.7% of the variance in the outcome variable. At Step 2, T1 depressed affect was entered and produced a significant effect, $F(3, 302) = 44.55$, $p < 0.001$, explaining an additional 1% of the variance in the dependent variable. Finally, the interaction term between T1 levels of depressed affect and T1 actual acceptance was entered at Step 3 and produced a significant effect, $F(4,301) = 34.31$, $p < 0.001$. It is important to note that at this step, T2 perceived social acceptance was primarily predicted by

T1 perceived social acceptance ($\beta = 0.50$, $p < 0.05$), followed by T1 actual acceptance ($\beta = 0.27$, $p < 0.05$) and the interaction between T1 actual acceptance and T1 depressed affect ($\beta = -0.27$, $p < 0.05$ using a 1-tailed test). Time 1 depressed affect scores were not observed to be statistically significant predictors of T2 perceived social acceptance ($\beta = 0.11$, $p > 0.05$).

Given these results, steps were taken to further clarify the finding with respect to the interaction between depressed affect and actual acceptance on Time 2 levels of perceived social acceptance. The coefficients observed in Step 3 (mentioned above) were used to create predicted Time 2 perceived social acceptance scores for the following four hypothetical groups: (a) children with low levels of depressed affect and low levels of actual acceptance, (b) children with low levels of depressed affect and high levels of actual acceptance, (c) children with high levels of depressed affect and low levels of actual acceptance, and (d) children with high levels of depressed affect and high levels of actual acceptance. High and low groups on each variable of interest were identified by creating scores using 1 SD above and -1 SD below the mean.

As seen in Figure 1, for adolescents in the low peer acceptance group, their levels of perceived social acceptance at Time 2 did not vary as a function of high or low levels of depressed affect. However, the effect of depressed affect became evident when comparing the groups with low versus high levels of depressed affect. Upon visual inspection of Figure 1, it appears that children with high levels of depressed affect did not benefit from high levels of actual peer acceptance, as their perceived level of social acceptance at Time 2 remained stable, regardless of whether actual acceptance at Time 1 was high or low. This suggests that depressed affect may lead one to be less sensitive to the potential benefits of actual peer acceptance, supporting our initial hypothesis.

Discussion

The primary aim of this study was to examine whether levels of depressed affect in a sample of school age children moderated the association between measures of peer-assessed and self-perceived social acceptance. Our prediction was grounded in theory about the formation of the self which suggests that perceptions of the self are influenced by an accurate awareness of experiences, as well as from cognitive theories of depression which provide evidence for the role of negative and distorted perceptions on the development and/or maintenance of depressive symptoms (Beck, 1976). Support was found for our hypothesis in that higher levels of depressed affect appeared to desensitize youth to actual levels of peer acceptance, seeing as though they perceive themselves to be less socially accepted than they actually are, as indicated by a sociometric measure of acceptance. Thus, it appears that depressed affect functions to impede accurate awareness of one's experiences.

When examining the pattern of results found across the various regression models, it can be observed that the regression model at Step 3, which included the interaction term between T1 actual acceptance and T1 depressed affect, did not account for significant variation (e.g., less than 1%), in the outcome variable (T2 perceived social acceptance). Interestingly however, the strength of the interaction term as a predictor variable was found to be statistically significant. Other variables that were found to be statistically significant predictors of Time 2 perceived social acceptance included: T1 perceived social acceptance and T1 actual acceptance. While both T1 actual acceptance and T1 perceived social acceptance demonstrated a positive relationship with the outcome variable, the interaction term revealed a significant negative association with the outcome. This suggested that the predicted score on the outcome variable would likely be different

at various levels of either depressed affect or actual acceptance, which led to further analyses to clarify this specific finding.

When comparing groups characterized by low or high levels of depressed affect, clear differences were observed. Specifically, youth characterized by low levels of depressed affect appear to accurately perceive their actual level of peer acceptance (see Figure 1). Thus, if their actual level of acceptance is low, they will perceive it as such and vice versa. In contrast, our findings demonstrate that youth characterized by high levels of depressed affect appear to be insensitive to high levels of actual peer acceptance compared to their non-depressed peers. Specifically, for youth with high levels of depressed affect, their perceived level of social acceptance was relatively the same, regardless of whether their actual level of acceptance was high or low. Therefore, individuals with higher levels of depressive symptoms may not benefit from peer acceptance, which has the potential to exacerbate and maintain their depressed state over time.

These findings are consistent with previous research which suggests that children who are more depressed may not accurately perceive their social acceptance. It has been shown that depressed youth may have a tendency to underestimate their level of social acceptance (Kistner et al., 2003; Zimmer-Gembeck et al., 2007), and that children's self-perceptions are more saliently related to their depressive mood compared to objective measures of social acceptance (Epkins & Seegan, 2015). Such claims have important clinical implications for intervention programs aimed at depressed youth, emphasizing the role that self-views and erroneous perceptions play in adolescent symptomology (Graham et al., 2003). Relatedly, it is also important to consider that youth who may perceive themselves as being less accepted than they actually are may in turn become more socially withdrawn, which consequently makes them less appealing social companions (Wagner et al., 2015). This may result in lower acceptance by peers, which may serve

to further reinforce their negative beliefs about their social competence and overall sense of belonging.

Findings from this study also shed light on the associations between children's self-perceptions and more objective indices of social acceptance. While prior investigations have indicated that children's self-perceptions are only moderately associated with objective measures of social competence (Harter, 1985; Kistner et al., 2003), our analyses suggest that the two measures are only weakly correlated. In particular, our study showed that the correlation between T1 actual acceptance and T1 perceived social acceptance was 0.23, and the correlation between T1 actual acceptance and T2 perceived social acceptance was 0.20. Although the direction of both of the associations was positive (suggesting that an increase in actual acceptance leads to an increase in self-perceived acceptance or vice versa), the poor strength of their relationship may suggest that perhaps a third variable exists that may be interfering with their association. Of particular interest is the pattern of relationships between both perceived and actual levels of acceptance with the measure of depressed affect. Specifically, when looking at the correlation between T1 depressed affect and T2 perceived social acceptance (r = -0.21), the direction of the effect is negative, indicating that higher levels of depressed affect may lead to lower levels of perceived social acceptance at a later time. Similarly, the correlation between T1 actual acceptance and T1 depressed affect is also negative (r = -0.23), suggesting that higher levels of actual acceptance are associated with lower levels of depressed affect within time. These findings provide further support for documented claims that lower levels of both perceived and actual social acceptance are associated with greater levels of depressed affect among youth (Cole et al., 1996).

The results from the present study align well with claims from the literature focusing on peer rejection, which also highlight the importance of considering children's self-perceptions of

their own rejection. Specifically, prior research has demonstrated that children's self-appraisals of rejection were associated with increased internalizing problems, even after controlling for actual levels of peer rejection (Kistner et al., 1999). Thus, across studies it appears that an adolescent's belief that he or she is accepted or rejected plays a critical role in the development of psychosocial maladjustment later on (Rubin et al., 2006).

Limitations and Implications

Alongside the number of contributions, the present study is not without limitations that are important to address. Firstly, despite incorporating a longitudinal burst design approach which has several advantages, the temporal gap between assessment times (8 weeks) may not have been sufficient to capture potential changes across the entire school year. Future studies would also benefit from examining how the patterns of association observed may differ across genders, as well as across cultural and socioeconomic status groups. Previous research has showed that girls place more importance on social relationships (e.g., Allgood-Merton et al., 1990) and that that negative attributional styles are more strongly linked to depression among girls (Kim-Spoon et al., 2012), whereas boys tend to report higher levels of self-esteem, on average, compared to girls during adolescence (Kling et al., 1999). Given this, it would be expected that girls would be more sensitive to experiences of social exclusion, and thus may be more likely to exhibit depressive symptoms and lower levels of perceived social acceptance.

With respect to variations across culture, Santo and colleagues (2013) have demonstrated that aspects of the self vary across contexts, such that social competence is a stronger predictor of self-worth among children in Montréal, Canada and among upper-middle class groups, whereas cognitive competence (e.g., academic performance) is more strongly associated with self-worth for children from Barranquilla, Colombia, and for lower-middle class groups (Santo et al., 2013).

As such, perhaps the relationship between perceived social competence and depressed affect observed in the present study would be significantly higher for those from upper-middle class groups, and among youth from Montréal, Canada. These questions and predictions would be an interesting avenue for future research.

Nevertheless, the current findings help to shed light on the significance of *feeling* accepted and connected to peers during early adolescence on depressive symptomology, which has important clinical implications. Given that self-esteem is more malleable during adolescence (Robins et al., 2012), intervention programs should focus on addressing dysfunctional attitudes and underlying biases and interpretations which can impede social awareness, and thus contribute to the onset and/or maintenance of depressive states (Zimmer-Gembeck et al., 2007). In addition, in order to enhance peer competence, adolescents may benefit from social skills training to improve social functioning, which has been shown to reduce internalizing symptoms and behaviour patterns in school settings (Cook et al., 2008; Kaman et al., 2021). Finally, our findings also speak to the clinical relevance and importance of obtaining self-assessment measures alongside other informant reports, seeing as though self-perceptions appear to be most predictive of depression (Graham et al., 2003).

Overall, the results of the present study add to our understanding of the relationship between children and adolescents' cognitive representations of their social functioning and negative affective states. Our findings highlight the importance of how those presenting with depressed affect may inaccurately perceive the degree to which they are accepted by their peer group, which can have important implications on their sense of belonging, degree of competence, and on their feelings of general self-worth.

Table 4.

Descriptive Statistics for All Measures at Time 1 and Time 2

Items	Cronbach's α	*M* (SD)
Time 1		
Depressed Affect (Waves 1 and 2)	.85	14.89
Sometimes I feel unhappy		(6.06)
Sometimes I feel lonely		
Sometimes I feel sad		
Perceived Social Competence	.82	16.11
I know how to get along well with others		(3.95)
It's easy for me to make friends		
I have a lot of friends		
Most kids in my class like being with me		
Time 2		
Depressed Affect (Waves 1 and 2)	.85	14.96
Sometimes I feel unhappy		(6.10)
Sometimes I feel lonely		
Sometimes I feel sad		
Perceived Social Competence	.83	15.70
I know how to get along well with others		(3.78)
It's easy for me to make friends		
I have a lot of friends		
Most kids in my class like being with me		

Table 5.

Means and Standard Deviations for Measures at Both Times (N = 306)

Variable	*M*	*SD*
Time 1		
Acceptance	4.76	1.92
Perceived Social Competence	4.05	.99
Depressed Affect	2.46	1.02
Depressed Affect x Acceptance	11.24	6.16
Time 2		
Perceived Social Competence	3.94	.94

Table 6.

Intercorrelations of Measures for the Full Sample

Variable	1	2	3	4	5
1. T1 Perceived Social Competence	1	.23**	-.19**	-.00	.54**
2. T1 Acceptance		1	-.23**	.58**	.20**
3. T1 Depressed Affect			1	.60**	-.21**
4. T1 Depressed Affect x Acceptance				1	-.05
5. T2 Perceived Social Competence					1

Note. $N = 306$

**$p < 0.01$.

Table 7.

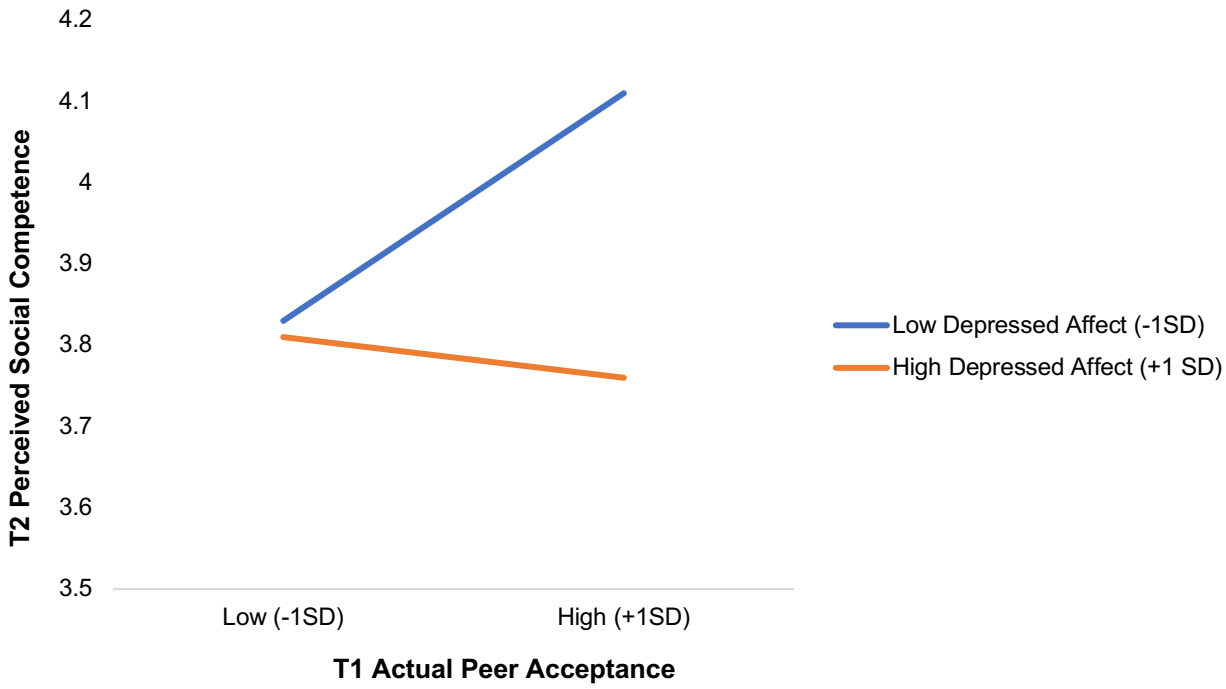
Summary of Hierarchical Regression Analyses Predicting Time 2 Self-Perceived Acceptance

Model	R	R^2	Adj. R^2	SE	ΔR^2	ΔF
1	.545	.297	.292	.789	.297	64.03*
2	.554	.307	.300	.785	.01	4.24*
3	.560	.313	.304	.783	.006	2.78

Note.
*$p < 0.05$.

Figure 6.

The Longitudinal Effects of Peer Acceptance and Self-Perceived Social Competence as a Function of Depressed Affect



General Discussion

The overarching aim of the present research was to investigate the degree to which friendship features (e.g., security, intimacy), peer experiences (e.g., acceptance) and emotional adjustment (e.g., anxiety, depressed affect) among early adolescents across the academic year are interrelated. The use of longitudinal designs and sophisticated statistical techniques (e.g., burst-design, multilevel modelling) allowed us to examine important intraindividual changes in internalizing symptoms over time, as well as to consider the interdependent and nested structure of peer data. Broadly, the present project contributes to the existing literature in important ways, which will be highlighted throughout this general discussion.

Summary of Findings and Implications

Study 1 sought to demonstrate the advantages of incorporating a measurement burst design methodology to account for momentary deviations in self-reported internalizing symptoms. It was expected that compared to measures obtained at a single time point at each wave of assessment, the measurement burst design would produce more reliable, precise, and representative measurements of important psychological constructs experienced in adolescence. Findings from Study 1 provided support for our initial hypothesis in that the measurement burst design provided a more stable and reliable measure of anxiety compared to the single-time longitudinal measurement design. It can be argued that while traditional longitudinal designs can be useful to assess individual trait values or "snapshots" of one's feelings of anxiety and/or depressed affect at a specific time, they do not account for individual states or changes around those fixed traits, which can differ from one time to the next as a result of situational factors (Persram et al., 2021). Specifically, consider the possibility that a data collection may have taken place on a day where a child has a) had an argument with a best friend, b) received a compliment by a peer, or c) received

a bad grade on a test. Measurements obtained in each of these scenarios will likely be influenced by these recent negative or positive experiences, which can make it so that the data obtained may not be entirely representative of an individual's global experiences (Persram et al., 2021). Given this, it is unsurprising that the ability to assess important psychological phenomena in an intensive manner (e.g., multiple times at each wave of assessment) provides developmental researchers with the opportunity to increase the precision and validity of their data (Persram et al., 2021). Study 1 allowed us to consider the importance and benefits of not only utilizing the burst-design format to assess internalizing constructs, but also when measuring important sociometric data (e.g., acceptance, rejection), which later inspired the design of Study 3.

Study 2 investigated the degree to which various friendship- and group-level features influence levels of social anxiety in a sample of early adolescents. The primary aim was to provide further support for the protective function of security-based experiences among friends, but also to investigate how classroom-level variables (e.g., collectivism, individualism, SES, acceptance/density) may also influence social anxiety trajectories over time. We consider Study 2 as being important in showing the need for researchers to utilize multiple levels of analysis to account for the nested structure of peer data, which is not common practice, despite claims that suggest that peer effects are not independent of the larger context in which they are embedded (Rubin et al., 2015). Specifically, findings from Study 2 supported prior claims that higher levels of perceived friendship security minimize the continuity of social anxiety among youth (Wood et al., 2017), whereas intimacy may exacerbate anxiety over time (Bagwell & Bukowski, 2018). Further, Study 2 added to the existing literature by demonstrating that classroom levels of individualism and acceptance/density strengthen the negative effect of friendship security over time, suggesting that provisions at the level of the group can also serve a protective function against

internalizing symptoms. Study 2 also helped shed light onto classroom-level factors that may predispose one to having higher initial levels of social anxiety compared to others. These factors included being female, and belonging to groups characterized by: lower-SES, low levels of collectivism, and low levels of acceptance/density. Overall, conclusions from Study 2 show promise for youth whose friendships may be lacking in the friendship quality features deemed most important, in that the classroom climate has the potential to provide similar protective benefits against the development of internalizing symptoms. The results from this study may also motivate developmental researchers interested in studying other psychological phenomena that are organized at multiple levels (e.g., siblings, employee-employer relationships) to incorporate sophisticated statistical techniques to properly account for the nested structure of their data.

Due to Study 1 and Study 2's focus on anxiety, Study 3 aimed to highlight how depressed affect, another internalizing symptom that typically emerges in early adolescence, may influence self-perceived levels of peer acceptance. We were interested in assessing whether the discrepancy between self-perceived (e.g., subjective) and actual/peer-rated levels of acceptance (e.g., objective) differed across youth with high and low levels of depressed affect. The rationale for Study 3 was inspired by the idea that a negative inferential style (which is typical of a depressive temperament) may impede the accuracy of one's awareness of their peer experiences. A primary strength of Study 3 was the fact that we incorporated the benefits of the burst design methodology when assessing both self-reported (depressed affect) and peer-reported (acceptance) data. Our findings supported initial predictions such that higher levels of depressed affect appear to interfere with one's ability to accurately perceive their level of social acceptance, which has important clinical implications. Specifically, higher levels of depressed affect were found to make youth insensitive to actual or more objective levels of peer acceptance, with depressed youth

underestimating how accepted they actually are. This aligns well with the core principles underlying cognitive-behavioural therapy (Beck, 1976). In particular, individuals with symptoms of depression are often found to be overly-negative in their interpretations of events (Beck, 1976) and that such a pervasive cycle of negative thoughts serves to maintain their depressed state over time. Thus, targeting an adolescent's negative and inaccurate perception of their level of peer acceptance in psychotherapy is critical for the prevention of maladjustment later on (Rubin et al., 2006). We propose that one possible way to help youth test the validity of their assumptions and perceptions is to have them participate in a form of behavioural experiment, which is commonly seen across cognitive-behavioural therapies (Gaudiano, 2008). This type of intervention would involve sharing objective data about one's level of peer acceptance with the goal of modifying one's distorted cognitions to more realistic and accurate perceptions.

Limitations and Future Directions

Although the current findings add important insights into the various peer-related factors and experiences that affect trajectories of anxiety and depressed affect, there are a few limitations that are important to consider. First, despite the fact that all three studies in this project implemented longitudinal designs, longitudinal trajectories were assessed at time points which did not span across the entire academic year. Future studies would benefit from incorporating multiple waves of assessment to more fully understand how the observed effects may differ across a greater interval of time, preferably at the beginning, middle, and end of the school year. Relatedly, while the inclusion of the burst design format in two of our three studies was a novel approach for assessing internalizing symptoms and sociometric data for levels of peer acceptance, future research should also aim to utilize the burst design when assessing perceived levels of friendship quality (e.g., security, intimacy) and other peer-related experiences that can influence psychosocial

adjustment (e.g., rejection, victimization). Given that one's perception of the quality of their best friendship can fluctuate from day to day as a result of situational events or factors (e.g., disagreements, arguments, perceived betrayals), incorporating the burst design to account for these variations would be imperative.

Furthermore, although Study 2 accounted for the effects of various classroom-level variables on levels of social anxiety, it is recommended that future studies examine other group-level variables or norms that have the potential to influence anxiety trajectories over time. One possible classroom norm that would be interesting to investigate is classroom level of prosocial behaviour (e.g., helping others). This idea is inspired by longitudinal studies which have suggested that adolescents who demonstrate helping behaviours are less likely to display internalizing problems (Padilla- Walker et al., 2015). Finally, given that our samples were made up primarily of early adolescents in fifth and sixth grade in the community, our results may not generalize to youth from other age groups, or to youth with clinical levels of internalizing symptoms. Thus, future work is needed to examine how the current findings may differ in a sample of older adolescents, and how they may change across various groups (e.g., gender, culture).

Conclusion

In conclusion, we hope that the findings from this project emphasize the significant role that peer relationships and experiences can have on an adolescent's mental health trajectory. Specifically, our studies shed light on the importance of considering the various contexts in which youth are embedded, as well as the impact that various experiences, occurring at the individual, dyadic, and group levels have on the development of a healthy self. Together, results from these studies offer further empirical support for the claim that positive peer experiences and interactions can serve a protective function against internalizing symptomology, whereas negative peer

experiences can have important consequences on one's well-being, sense of self, and overall adjustment.

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Appendix A

Ethics Forms

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. William Bukowski

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: One World / Whole Child - 2014

Certification Number: 30002779

Valid From: December 10, 2015 to: December 09, 2016

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. William Bukowski

Department: Faculty of Arts and Science\ Psychology

Agency: Social Sciences & Humanities Research Council

Title of Project: One World / Whole Child - 2014

Certification Number: 30002779

Valid From: May 04, 2017 to: May 03, 2018

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Appendix B

Information Letter to Parents

Dear Parent(s),

I am a professor at Concordia University, where I teach and do research on the development of children and adolescents. One of the topics I study is how children's experiences with their parents, friends, and teachers affect their well-being. This topic is of interest to many parents, teachers, and health professionals. The purpose of this letter is to tell you about a study my students and I are conducting with fifth- and sixth-graders. This study will help us learn more about children, their health, and their development.

As part of the study, we will meet with the participating children in their classrooms two times during the school year, once in October or November and again in January. These meetings will last about 20 minutes. We will meet the children in their school and I will ask them to complete a questionnaire at their desks.

In these questionnaires, we will be asking children to identify:

- Who they typically associate with in school (for example who are their friends);
- The characteristics of other children in their class (that is, what are their peers like);
- Behaviours performed by other children in the class (e.g. helping, participating in certain types of activities, etc.);
- How they think about themselves;
- How they perform in school and in their social relationships.

All the questionnaires will be completed at the child's desk at school and none of the other children or the teachers will know how any other child has answered the questions.

In individual interviews the participating children will also play a set of games on a computer that will assess generosity toward others.

We will also ask the participating children's parent(s) to complete a questionnaire for us. It will ask questions about family functioning, parental education and employment, and family income. As an expression of our gratitude we will give two tickets to a local movie theater to parents who return the parent questionnaire to us. Parents who choose not to fill out the parent questionnaires can still allow their children to take part in the study.

Teachers will be asked to complete a short questionnaire about the academic and social functioning of the participating children.

As a token of thanks, all participating children will receive a gift of a t-shirt from the research team at the conclusion of the final data collection. In addition, we will be giving talks to the students about mental health, and about ways to cope with the stressors they encounter in their daily lives.

We ask the children to keep their answers private and we make certain that their answers are kept confidential. The information collected in this study will be <u>completely confidential</u>, and participation is entirely voluntary. Your child is not required to participate in this study. Furthermore, you or your child may change your mind at any time even if you already gave your permission.

People who do research with children or adults are required to describe the risks and benefits related to participating in their studies. We assure you that this study poses no risks, other than what children encounter in their day-to-day lives. It is not a treatment study and it is not intended to provide direct benefits to the students who participate, though most children enjoy participating in such studies.

This study has been approved by both the School Board and the Concordia University Human Research Ethics Committee. If at any time you have questions or concerns regarding your rights or your child's rights as research participants, please feel free to contact the Research Ethics and Compliance Advisor of Concordia University, at ethics@alcor.concordia.ca.

If you have any other questions about the study, please call me at 514-848-2424 Ext. 2184 or send me a letter at: Department of Psychology, Concordia University, 7141 Sherbrooke Ouest, Montreal, QC, H4B 1R6. You can also email me at william.bukowski@concordia.ca.

Please fill out the attached form and have your child return it to his/her teacher tomorrow.

As an incentive for the children to return the assent form, any child who returns a slip, regardless of whether his/her parent has given permission for participation, will be given a set of Concordia University highlighters by the research team.

Thank you for your help. We very much appreciate it.

Sincerely,

William M. Bukowski
Professor

Appendix C

Parental Consent Form

ONE WORLD WHOLE CHILD PROJECT

Grades 5 and 6

PARENTAL CONSENT FORM

Please read and sign the following:

I understand that my daughter/son has been asked to be in a study conducted by Dr. W. M. Bukowski.

I understand that the study is about how children's experiences with their peers and how they think about themselves affects their well-being. I understand that if my daughter/son participates she/he will be asked to answer questionnaires at his/her desk in the classroom. I understand that the questionnaires are about how young people think and feel about themselves and their friends. I understand that the children will complete the questionnaires two times during the school year. I understand that all participating children will receive a gift of school supplies and a t-shirt from the research team at the conclusion of the final data collection.

I understand that my daughter/son does not have to be in the study. I understand that even if she/he participates at first but changes her/his mind she/he can quit at any time. I understand that all answers are confidential and will NOT be shown to anyone. Only Dr. Bukowski and the members of his research team will know what is in the questionnaires.

Please check one of the following and ask your daughter/son to bring this consent form the homeroom class tomorrow.

____ My son/daughter has permission to take part in Dr. Bukowski's study

____ My son/daughter DOES NOT have permission to take part in Dr. Bukowski's study.

Parent's Name: _____

Signature: _____ Date: _____

Child's Name: _____ Child's Gender □ Male □Female

Child's date of birth: DAY: _____ MONTH: _____ YEAR: _____