Running head. Relationships with Teachers and Parents

Toward a Comprehensive Assessment of Relationships with Teachers and Parents for Youth with Intellectual Disabilities

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Abstract

Aims. This study proposes a multi-informant (youth, teachers, and parents) measure of relationship quality with adults for youth with intellectual disabilities (ID).

Methods. A sample of 395 youth with mild (49.15%) and moderate (50.85%) ID, aged 11–22 (M=15.82) was recruited in Canada (French-speaking, N=142,) and Australia (English-speaking, N=253).

Results. Results support the reliability, factor validity, discriminant validity (in relation to sex, ID level, country, and comorbidity), convergent validity (depression, anxiety, aggressiveness, and prosocial behaviors), and one-year longitudinal stability of the measure.

Conclusions. Youth self-reports provide a complementary perspective on relationship quality with adults relative to teachers' or parents' reports, whereas teachers and parents seem unable to differentiate their own perspective from that of the target youth.

Keywords: Measurement; student-teacher relationships; parent-child relationships; intellectual disability; special education needs; confirmatory factor analysis; scale validation.

Compliance with Ethical Standards

Disclosure of Potential Conflicts of Interest:

- The authors have no relevant financial or non-financial interests to disclose.
- The authors have no conflicts of interest to declare that are relevant to the content of this article.
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Research Involving Human Participants or Animals:

- Authorization to conduct the study was obtained from the research ethics committees of the fourth, fifth, and last authors' institutions

Informed Consent:

- All participants provided voluntary and informed consent following procedures outlined in the Method section.

1. Introduction

As a result of their limited cognitive abilities and social skills (Craven et al., 2015), youth with an intellectual disability (ID) tend to display lower autonomy levels and greater dependence on adult caregivers relative to typically developing (TD) youth. For this reason, their ability to maintain quality relationships with adult caregivers becomes critically important (Craven et al., 2015). High-quality social relationships are characterized by feelings of warmth, relatedness, connectedness, and support, and by low levels of conflicts and disagreements (Pianta, 2001). Unfortunately, despite their greater risks for psychosocial adjustment difficulties (Maïano et al., 2018), there is a scarcity of research addressing the drivers of psychosocial adjustment among youth with ID, particularly those involving their relationships with parents and teachers. This research shortage is partly due to the difficulty in measuring internal states, such as youth perceptions of relationship quality, among this population. As a result, most studies of youth with ID rely on parent or teacher reports which, although informative, remain unable to adequately reflect youth's unique perspectives, which are valid in their own right, regarding their relationships with these core caregivers (Bear et al., 2002; Turk et al., 2012). These observations highlight the need to develop proper and comparable measurement instruments to assess relationship quality among this population from various perspectives (self- versus informant-reports).

1.1. Relationships with Parents and Teachers

Attachment theory (Bowlby, 1973) notes that the attachment bond between parent and child arise from early interactions between infants and their caregivers with whom they seek proximity. Early attachment research has highlighted the need to differentiate between secure attachments, emerging when parents are sensitive, warm, and available, from insecure attachments, emerging from exposure to insensitive or unreliable caregivers (Ainsworth, 1989). Infants' behaviors and reactions also contribute to the creation of this bond, such as those exhibiting an easy temperament are more likely to develop a secure attachment style (Planalp & Braungart-Rieker, 2013). As children grow, they come to internalize their expectations regarding their interactions with their parents into enduring internal working models, which then act as a template for future relationships (Bowlby, 1973).

Once the early attachment bond is established, parenting play an additional role in shaping the quality of parent-child relationships. According to Baumrind (1991), parenting behaviors can be summarized according to the responsiveness (demonstrating warmth and acceptance) and control (establishing and enforcing rules) dimensions. Early parenting theory suggested that an optimal parenting style was one that combined both dimensions, whereas exposure to purely controlling parents seemed to carry the least desirable outcomes, such as increasing children's disruptive behaviors and overall poor adjustment (Smokowski et al., 2015). In turn, undesirable behaviors from a child might increase parents' tendencies to adopt controlling behaviors (Besemer et al., 2016). These observations led Lewis (1981) to propose parent-child conflict, rather than simply the presence of parental control not backed up by responsiveness, as the main driver of the undesirable consequences of exposure to controlling parents. As such, the nature of the interpersonal relationship that youth share with their parents is often measured along the two dimensions of warmth and conflict (Searle et al., 2013). Warmth is defined as positive interactions between youth and their parents, characterized by positive affect, emotional availability, and support. In contrast, conflict takes the form of unpleasant, hostile, unsupportive, and quarrelsome interactions between youth and their parents.

As youth enter school, early attachments and internal working models are expected to help shape the new relationships that they develop with their teachers (Verschueren & Koomen, 2012). The relationship that is formed between youth and teachers is, once again, assumed to emerge from reciprocal interactions between both members of this dyad, whereby youth's behaviors influence teachers' behaviors and vice-versa (Verschueren & Koomen, 2012). Research conducted on youth relationships with their teachers, following seminal work by Pianta (2001), operationalize student-teacher relationship (STR) along the same dimensions of warmth and conflict used to describe the parent-child relationship (PCR). However, STR are arguably not as long lasting as PCR, suggesting that teachers are likely to display relationships differing from those involving parents, or that change over time (Verschueren & Koomen, 2012). For this reason, positive STR are likely to serve a particularly important role for otherwise isolated or at-risk children, especially for youth with ID.

1.2. The Importance of STR and PCR Among Youth with ID

PCR and STR lie at the junction of the perceptions of all those involved in the relationship, as both members of the dyad (i.e., parent and child, or teacher and student) contribute to its quality. As

with TD youth, parents of youth with ID are also more likely to adopt negative or controlling behaviors when their child displays difficult or externalizing behaviors, and vice versa (Blacher et al., 2014; Eisenhower et al., 2007; Fenning et al., 2014; Schuiringa et al., 2015). More specifically, parents are more likely to feel negative emotions such as anger and frustration when their child displays such behaviors (Chavira et al., 2000). However, it is not clear what type of emotional reaction these relationships elicit among youth with ID, given that studies very rarely consider their perspective in this regard. Importantly, as youth with ID transition into any new school or classroom context, the relationship difficulties that they experience within the parent-child dyad may generalize to the student-teacher dyad (McIntyre et al., 2006). Indeed, youth with ID have been shown to partially reproduce the relationship styles they share with their parents when interacting with their teachers (Eisenhower et al., 2007). In addition, youth's behavior problems or lack of emotional expressivity have both been identified by teachers as obstacles to the quality of their STR (Blacher et al., 2009; Rea et al., 2016). Although these observations clearly indicate that STR and PCR are influenced by the behaviors of all those involved in the relationship, all of these previous studies have relied on teacher-, parent-, or observer-reports, thus completely ignoring youth's perspective.

This lack of attention to youth with ID's perspective when assessing their relationships with parents and teachers is worrisome because they present a higher risk of developing insecure attachment styles with their primary caregivers (Hamadi & Fletcher, 2019; Teague et al., 2018). Relationship quality may be even more critical for youth with ID, who tend to struggle to autonomously meet the same development milestones as their TD peers. With adolescence comes the first steps towards independence from caregivers, as youth look to their friends, social groups, and even teachers for guidance and approval (Eccles, 2009). However, for youth with ID, this independence may be more difficult to acquire as their limited cognitive skills hamper their ability to gain autonomy from their primary caregivers (Craven et al., 2015).

All these observations highlight the need to allocate increased scientific attention to the quality of the relationship youth with ID share with adult caregivers, especially during adolescence, while recognizing the perspective of all those involved in these relationships. So far, the lack of systematic multi-informant measures of relationship quality validated for this population may explain that limited attention has been devoted to the systematic investigation of the role played by STR and PCR for youth with ID, while also acknowledging their own unique perspective on these relationships. Assessing relationship quality among youth with ID poses many challenges. On the one hand, adapting measures for self-report is complex due to the need to account for the limited cognitive and verbal skills typically demonstrated by youth with ID, who often fail to correctly grasp the meaning of items created for TD populations (Turk et al., 2012). As a result, there is a lack of validated self-report measures and most of the literature for this population relies on parent, teacher, or observer reports (e.g., Fenning et al., 2014; Prino et al., 2016; Schuiringa et al., 2015). On the other hand, parental and teachers' reports make it possible to rely on measures validated among TD populations, but cannot accurately capture youth's perspective, voice, and agency. Indeed, although parents and teachers generally have greater success in understanding traditional questionnaire items, their perspectives differ from that of youth, with or without ID (Bear et al., 2002; Turk et al., 2012; Scott & Havercamp, 2018). Hence informant perceptions are distinct from self-perceptions. Importantly, because both STR and PCR lie at the junction of the perspectives of those involved in the relationship (Verschueren & Koomen, 2012), achieving a complete understanding of these relationships requires taking into account the perspectives of all those involved.

Finally, since research on STR and PCR remains separate, the measures developed for each also differ, making it impossible to compare results obtained in one area (e.g., STR) to results obtained in the other area (e.g., PCR). This diversity makes it hard to integrate results, especially when considering that most research has ignored youth's perspectives on these relationships. As such, the present study aims to adapt a multi-informant (youth, teacher, and parent) measure of STR and PCR which is well-suited for (1) the understanding of youth with an ID and (2) recognizes the perspective of all those involved in each dyadic relationship (student-teacher and parent-child).

1.3. The Present Study

1.3.1. Scale Development and Validation. This study relies on a short form (Morin et al.,

2009; Morin, Maïano et al., 2013) of the Student-Teacher Relationship Scale[1] initially developed by Pianta (2001) to assess STR among TD youth, and which has since been extended to cover PCR (Totsika et al., 2014). In the current study, we present a multi-informant adaptation of this measure for youth with ID. Although the original version (i.e., Pianta, 2001) of this scale has already been used to assess STR (Blacher et al., 2009; Prino et al., 2016; Roeden et al., 2012) or PCR (Totsika et al., 2014) among samples of youth with ID, these previous studies have exclusively relied on teacher or caregiver reports. As a result, this scale has never been formally adapted, or validated, for use in a self-report format to allow youth with ID to report on their own perceptions of these relationships. Due to the challenge posed by self-report measurement among youth with ID who, because of their more limited cognitive and verbal skill often struggle to understand questionnaire items developed for populations of adults or TD youth (e.g., Finlay & Lyons, 2001, 2002), the creation of a self-report version of this instruments required an extensive process of adaptation. Furthermore, despite the availability of parent and teacher versions of this measure, these informant versions of the questionnaire also needed to be adapted in order to result in a suite of measures that could be considered to be fully parallel across all versions (STR and PCR) and informants (youth, parents, and teachers). The process via which the questionnaires were adapted for self-report among youth with ID is described in Appendix A of the online supplements. Following Pianta's (2001) original measure, this adapted questionnaire assesses the separate dimensions of warmth and conflict, which characterize STR and PCR as reported by the target youth but also by their teachers and parents. Teachers' and parents' reports were also extended to cover: (a) their own feelings toward the target youth; (b) their perceptions of the target youth's feelings toward them.

In this regard, the first objective of the study is to identify the optimal factor configuration of responses obtained on the STR and PCR measures to accurately reflect (1) youth's perspective regarding their unique relationship with each of these two types of caregivers (i.e., parents and teachers), as well as caregivers (i.e., teachers and parents) (2) own perspective in relation to their relationships with the target youth and (3) perception of the target youth's perspective on these same relationships. In doing so, we will more specifically assess whether youth and caregivers' evaluations of their relationships are coherent enough to form a single latent construct (one for each aspect of the relationship, i.e., warmth and conflict) or whether they form distinct constructs (one for each informant in relation to each aspect of the relationship, i.e., warmth and conflict). If the latter representation is supported, we will also consider whether both informants are able to differentiate their own perspective from that of the target youth when describing their relationships, as well as to the extent to which informant reports of a specific dimension (i.e., warmth or conflict) match (i.e., are correlated with) youth self-reports of the same dimension. We expect: (a) youth, teachers, and parents to provide a reliable assessment of relational warmth and conflict; (b) teachers' and parents' reports of their own perspective to match their reports of the youth's perspective; and (c) youth rating of warmth and conflict will be sufficiently distinct (i.e., complementary) from parents' and teachers' perspectives (with $r<.500$). However, we leave as an open research question whether parents and teachers will be able to reliability differentiate their own perspective on these relationships form that of the target youth.

1.3.2. Differential Item Functioning and Discriminant Validity. Our second objective is to ascertain that the psychometric properties of this new instrument will remain unchanged as a function of various youth characteristics (i.e., sex, ID level, country/language, and comorbidities). This verification involves tests of Differential Item Functioning (DIF), conducted to verify whether participants' characteristics affect (i.e., bias) their pattern of response to specific items over and above the effects of these characteristics on the latent constructs (Wang & Shih, 2010). Consistent with our expectation that the resulting instrument will be generalizable to all types of youth with ID, we expect items to function in the same manner regardless of sex, ID level, country/language, and comorbidities. However, in terms of discriminant validity, we expect to observe mean-level differences on the latent constructs considered here (i.e., STR and PCR warmth and conflict) as a function of these characteristics matching differences previously reported in research. For instance, research has shown that girls, with or without ID, were more likely to develop closer and less conflictual relationships with adults relative

[1] The original Student-Teacher Relationship Scale also includes a Dependency subscale. However, compared to the Warmth and Conflict subscales, the dependency subscale is rarely used in part due to its poorer psychometric properties (Pianta, 2001). For this reason, it was also not included in the current validation study.

to boys (Blacher et al., 2009; Hajovsky et al., 2017). Youth with more pronounced levels of ID (Eisenhower et al., 2007) and presenting comorbid conditions (Blacher et al., 2009) have also been shown to display poorer relationships with adults than their peers. However, there should be no effect of country/language on any of the constructs considered here, consistent with the full equivalence of the linguistic versions of the instrument and the similarity in the general life and educational conditions of people with ID observed in the two countries considered in this study, Canada and Australia.

1.3.3. Convergent Validity. Our third objective was to assess the convergent validity of the proposed instrument via the investigation of associations between relationship quality and youth's psychosocial adjustment (i.e., depression, anxiety, aggressiveness, and prosocial behaviors). For all psychosocial adjustment and relationship quality indicators youth self-reports were considered in combination with teachers' and parents' reports. Evidence of convergent validity would come from the observation of positive associations between reported STR and PCR warmth and positive indicators of adjustment, whereas conflict is expected to be associated with poorer levels of adjustments (Longobardi et al., 2019). Empirical evidence obtained among samples of TD youth (PCR and depression/anxiety: Babore et al., 2016; PCR and aggressiveness: Weaver et al., 2015; PCR and prosocial behavior: Yoo et al., 2013; STR and depression/anxiety: Huang et al., 2018; STR and aggressiveness: Drugli, 2013; STR and prosocial behavior: Obsuth et al., 2017), as well as among samples of youth with ID (PCR and depression/anxiety: Baker et al., 2019; PCR and aggressiveness: Totsika et al., 2014; STR and depression/anxiety: Olivier et al., 2020) generally support these assumptions. Research also suggests that the consequences of relational conflict are greater than the benefits of warmth (PCR and aggressiveness: Pinquart, 2017; PCR and prosocial behavior: Padilla-Walker et al., 2016; STR and depression/anxiety: Longobardi et al., 2019; STR and aggressiveness: Roorda & Koomen, 2020). Finally, consistent with each informant having a unique and complementary perspective, we expect stronger associations between relationship quality and the outcomes when evaluated by the same rater (Turk et al., 2012).

1.3.4. One-Year Longitudinal Stability. Our fourth objective was to investigate the extent to which the psychometric properties of this new instrument would generalize over one year (i.e., measurement invariance; Millsap, 2011) and the longitudinal stability of ratings obtained on this instrument over the same period. Since parents rarely change over time, whereas homeroom teachers change annually, we expect indicators of PCR to demonstrate higher longitudinal stability than indicators of STR.

2. Materials and Methods

2.1. Participants

The current study analyses data among a sample of 395 youth with mild (49.15%) and moderate (50.85%) levels of ID, aged 11–22 years old (M=15.82, SD=2.97), and enrolled in secondary schools (grades 7 to 11) located in Canada (French-speaking, N=142, 49.30% males) and Australia (English-speaking, N=253, 67.20% males). ID classifications were determined using the IQ scores available in the school records (moderate ID corresponds to a global IQ of 36 to 49; mild ID corresponds to a global IQ of 50 to 69), in line with the DSM-IV (APA, 2000) which was the official classification system used in school records for participating students at the time of data collection. In Canada, 30.99% of participating youth attended a special school, and 69.01% attended a regular school, all of them in a special classroom. In Australia, all participating youth attended a regular school and of those 92.6% attended a special classroom. In both countries, students attending special schools or special classrooms spent most of their time with the same teacher and thus completed the STR questionnaire by referring to that teacher. Youth attending a regular classroom (in Australia only: 7.4% of Australian youth) completed the STR questionnaire by referring to the teacher which they perceived as the most significant to them.

Of those participants, 258 (81 in Canada and 177 in Australia) were then retested one year later following the same procedures (61.24% males; 45.49% mild ID; 54.51% Moderate ID). The parents (the mother for 79.3% of youth) from 179 youth (95 in Canada and 84 in Australia) also completed a questionnaire related to the target youth (55.06% males; 42.13% mild ID; 57.87% Moderate ID). Likewise, the homeroom teachers (81.9% of whom were females) from 282 youth (119 in Canada and 163 in Australia) completed a questionnaire related to the target youth (59.93% males; 45.53% mild ID; 54.47% Moderate ID). For youth attending special schools or classroom, homeroom teachers are those with whom participants spend most of their time. For youth attending regular schools, homeroom

teachers are those holding administrative responsibility for the student.

2.2. Procedures

All participants were recruited within schools or community organizations that agreed to support this research proposal. No compensation was offered for participation in Australia, whereas Canadian participants were eligible to win one out of 40 gift certificates ($30 CAD) annually. Parents (or legal representatives) of all participating youth actively provided signed informed consent for their own, and their children's participation. For parents of youth recruited in schools (N = 130 in Canada and 253 in Australia), this consent form was directly sent to the parents by the school, with an information letter, and the signed consent form was returned to the school where members of the research team recuperated it. Parents recruited outside of the participating schools (N = 12 in Canada and 0 in Australia) received this material directly from the research team and returned the signed consent form to the researchers using a reply-paid envelope.

The consent procedure granted the researchers access to school records for youth recruited inside as well as outside of school, including youth's most recent level of intellectual functioning (only youth with an official school-based ID classification were recruited). The Wechsler (2008) Intelligence Scale for Children – Fourth Edition (WISC-IV) was the IQ test most frequently used by the schools in both countries. When the last IQ assessment in the school records was older than four years, a new IQ assessment was conducted by a registered psychologist using the WISC-IV, the Wechsler Adult Intelligence Scale-IV, or the Leiter international performance scale-revised (Roid & Miller, 1997), depending on age and verbal ability. In Australia, a total of 34 participants were assessed by our research team, and all of them completed the Wechsler version corresponding to their chronological age (31 WISC-IV and 3 WAIS-IV). In Canada, 77 participants were re-assessed, 63 of them using the Wechsler version (29 WISC-IV and 34 WAIS-IV) based on their chronological age, and 14 of them (with lower verbal expression skills) using the Leiter scale. This breakdown is not available for most participants from whom we obtained IQ scores from the school records.

Participating youth were met at their school (or at a time and location most convenient for the parents for participants recruited outside of schools) by trained research assistants who explained the goals and procedures of the study, as well as youth's right not to participate or to withdraw from the study without any consequences. Thus, youth were asked to actively and voluntarily consent to the study. Using sample questions for each questionnaire section, research assistants explained how to use the response scales (all involving graphical displays and pictograms). Testing was realized in small groups including up to 8 youth with mild level of ID or including 1 or 2 youth with moderate levels of ID for youth recruited in school. The physical separation between the youth was maximised, using all of the available space in the testing room. Youth recruited outside of school were tested individually. A read-aloud assisted procedure was utilized to maximize understanding, and youth were encouraged to ask questions. All youth reported their answers on a paper questionnaire on which they circled their response. All discussions that youth had with the research assistants pertained to their understanding of the items and response scales, and not to the content of their answers. Youth were instructed to circle their answer rather than to say it out loud, which ensured that their responses were kept private. Sometimes, despite the available support, youth remained unable to understand a question. In these instances, they were instructed to select the "do not understand" option. Those responses (1.8% to 7.3%; M=4.2%) were treated as missing values. During data collection, research assistants always had direct access (via phone or in person) with one member of the research team.

Parents of all participating youth were asked to complete a questionnaire each year of the study. This questionnaire was sent to them by the school or by the research team for those recruited outside of schools. Parents could complete the questionnaire at a time convenient for them, and return either to the schools or the researchers using a reply-paid envelope. Participating schools also agreed to distribute and collect teacher consent forms and questionnaires each year of the study (teachers of participants recruited out of schools were directly contacted by the research team). Teachers were encouraged to complete the questionnaire while the research team was conducting the data collection with the students (questionnaires were recuperated by the research team), or at a time more convenient for them (questionnaires were sent to the research team using a reply-paid envelope).

In Australia, all testing procedures (involving youth, their parents, and their teachers) were conducted in English, whereas all testing procedures were conducted in French in Canada.

Authorization to conduct the study was obtained from the research ethics committees of the fourth, fifth, and last authors' institutions. Readers seeking additional details on our procedures are welcome to contact the corresponding author.

2.3. Measures

The measures of depression (Glasgow Depression Scale for People with Intellectual Disabilities) and anxiety (Glasgow Anxiety Scale for People with Intellectual Disabilities and Anxiety, Depression and Mood Screen) used in the present study were already validated for a population of youth with ID. This was not the case for the measures of STR, PCR, aggressiveness, and prosocial behaviors, which went through an extensive adaptation process for self-reports by youth with ID using procedures matching those used to adapt other self-report measures for this population (see Appendix A, and Maïano et al., 2009, 2011a, 2011b). More precisely, questionnaire items were maximally simplified, item redundancy was kept to a minimum, and items as well as response scales were all accompanied by graphical depictions to facilitate understanding. This adaptation was realized via a collaborative process, including bilingual researchers familiar with this process and population, as well as teachers, psychologists, and psycho-educators all experienced in working with youth with ID. A first version of the adapted measures was pre-tested as part of a first pilot study conducted among youth (13 to 21 years old; n=8 in Canada and n=10 in Australia) with mild to severe ID, their teachers, and parents. This first pilot study was used to contrast different formulations of the questions and response scales, and alternative response format (verbal only, pictorial only, and combination). This initial pilot led to an improved version of the questionnaires (where each item was presented and rated using a rating scale combining graphical and verbal elements). This improved version was trialed in a second pilot study (n=6 youth in Canada and n=10 in Australia, teachers, and parents) to confirm the adequacy of the resulting questionnaires and revise the final versions used in the main study. For a detailed description of the pilot study, please see Appendix A of the online supplements.

2.3.1. Relationship Quality. Youth's reports on the quality of their STR and PCR were measured using an adapted version of a short form (Morin et al., 2009; Morin, Maïano et al., 2013) of the Student-Teacher Relationship Scale (Pianta, 2001). This 13 items scale includes six items measuring warmth (e.g., "My teacher is nice and friendly to me"; Canada: α=.724; Australia: α =.843) and seven items measuring conflict (e.g., "Sometimes, my teacher is unfair with me"; Canada: α=.796; Australia: α =.862) on a five-point scale ranging from "totally disagree" to "totally agree." A matching set of 13 items were developed to ask youth to report on PCR warmth (e.g., "I trust my parents"; Canada: α=.808; Australia: α=.872) and conflict (e.g., "I often argue with my parents"; Canada: α=.739; Australia: α=.671) using the same response scale.

Using the items developed for youth's self-reports as the starting point, two matching sets of 13 items were adapted to teachers, one asking them to assess the quality of their relationship with the student from their own perspective and one asking them to assess the quality of the same relationship from their evaluation of the student's perspective: (a) warmth– youth's perspective (6 items; e.g., "This student shares a warm and friendly relationship with me"; Canada: α=.770; Australia: α=.777); (b) warmth–teacher's perspective (6 items; e.g., "I have a warm and friendly relationship with this student"; Canada: α=.824; Australia: α=.790); (c) conflict– youth's perspective (7 items; e.g., "Sometimes, this student feels unfairly treated by me."; Canada: α=.803; Australia: α=.786); and (d) conflict–teacher's perspective (7 items; e.g., "I sometimes feel unfairly treated by this student"; Canada: α=.865; Australia: α=.853). These items were rated on a five-point scale ranging from "strongly disagree" to "strongly agree."

Finally, parents also answered the same 13 items (using the same response scale) according to their perspective of their relationship with their child, and according to their perception of their child's perspective on the relationship: (a) warmth–youth's perspective (6 items; e.g., "My child feels close to me and trusts me"; Canada: α=.674; Australia: α=.802); (b) warmth–parents' perspective (6 items; e.g., "I feel close to my child and trust him/her."; Canada: α=.686; Australia: α=.747); (c) conflict– youth's perspective (7 items; e.g., "It takes my child a lot of energy to discuss and negotiate with me"; Canada: α=.724; Australia: α=.763); (d) conflict–parents' perspective (7 items; e.g., "I need a lot of energy to discuss and negotiate with my child"; Canada: α=.796; Australia: α=.828).

The items and response scales used to assess STR and PCR are presented in Appendix B of the Online supplements. The complete questionnaires are available free of charge upon request from the corresponding author.

2.3.2. Psychosocial adjustment. Details regarding the specific measures used to assess the outcomes are presented in Table 1.

2.3.3. Covariates. Youth's sex (0=male; 1=female), country of residence (0=Canada; 1=Australia), and ID level (0=mild; 1=moderate) were obtained via official school records. Among participants, 108 (27.3%) had a reported comorbidity (coded 0=none; 1=yes; 54 presented a comorbid autism spectrum disorder, 48 a comorbid genetic syndrome, and 6 both comorbid conditions).

2.4. Data Analysis

2.4.1. Model Estimation. All analyses were conducted using Mplus version 8.3 (Muthén & Muthén, 2019) and the robust weight least square estimator (WLSMV). This estimator is designed to handle ordinal rating scales following asymmetric response thresholds (Li, 2016), such as those used in the present study, and to provide a closer representation of participants' response process (Freund et al., 2013). All models were estimated using the full information available in the sample (Enders, 2010), using the missing data algorithm implemented in Mplus for WLSMV estimation (Asparouhov & Muthén, 2010). Missing data was low at the item level. More precisely, at Time 1, missing responses ranged from 5.90% to 16.80% (*M*=11.38%) for youth's reports, from 0.35% to 4.26% (*M*=1.74%) for teachers' reports, and from 0.56% to 7.26% (*M*=2.70%) for parents' reports. At Time 2, missing responses ranged from 7.36% to 13.57% (*M*=10.05%) for youth's reports, from 0.68% to 1.37% (*M*=.85%) for teachers' reports and from 4.5% to 9.1% (*M*=6.12%) for parents' reports.

2.4.2. Measurement Models. Alternative confirmatory factor analytic (CFA) measurement models were first estimated to identify the optimal measurement structure of the multi-informant relationship questionnaire. Given the complexity of these models, we first conducted this examination separately for the STR and PCR components, before merging the two optimal models. In **Model 1** (see Figure 1 in Appendix C of the online supplements), separate CFA factors were used to represent each alternative perspective (youth's reports, youth's perspective rated by the caregiver, and caregivers' perspective) of both dimensions (warmth and conflict), resulting in a six-factor model. This model assumes that youth, caregivers' own perspective, and caregivers' perception of youth's perspective on warmth and closeness are form six distinct, but correlated, constructs. In **Model 2** (see Figure 2 in Appendix C), separate CFA factors were used to represent the report of each rater (youth reports versus caregiver reports combining the two perspectives reported by the caregiver) of both dimensions (warmth and conflict), resulting in a four-factor model. This model assumes that youth's perspective is distinct form that of their caregiver and that all informants are able to differentiate warmth from conflict, but that caregiver's are unable to differentiate their own perspectives from their perception of the target youth's perspective. In **Model 3** (see Figure 3 in Appendix C), one orthogonal method factor was added to Model 2 to account for the shared variance in the caregiver-rated items reflecting the youth's perspective (Eid et al., 2008). Method factors are latent factors added to a measurement model to account for the fact that some items share some variance that is unrelated to the main constructs being assessed, but that rather reflect some characteristics of the measurement procedures. Method factors are thus used to account for a methodological artifact that is likely to result in biased estimation of the constructs of interest if left unmodelled (for more information on method factors, see Marsh et al., 2010). In Model 3, the method factor is used to control for the methodological artifact of having asked parents and teachers to report on their own perspective, as well as on the perspective of the target youth, which are then used to assess a single factor for each aspect of the relationship (warmth and conflict). In **Model 4** (see Figure 4 in Appendix C), two main factors reflecting relational warmth and conflict were included, and two method factors (uncorrelated with the main factors but allowed to correlate between them) were used to reflect caregivers' reports of (1) their own and (2) the youth's perspective. This model assumes that youth's and caregivers' perspective form a single factor for each aspect of the relationship (warmth and conflict), while also controlling (i.e., method factor) for caregivers' perspective of their own and their perception of the target youth's perspectives. In **Model 5** (see Figure 5 in Appendix C), similar to Model 4, we incorporated a single method factor (rather than two as in Model 4) to reflect caregivers' ratings. As such, this model also assumes that youth's and caregivers' perspective form a single factor for each aspect of the relationship (warmth and conflict), and accounts (i.e., method factor) for caregiver's undifferentiated reports of their own and their perception of the target youth's perspective. In all of these models, all factors were only defined by their a priori indicators and a priori correlated uniquenesses were included to reflect the parallel wording of the items used to assess relational warmth and conflict across youth and caregivers' perspectives (Marsh et al.,

2013).

2.4.3. Differential Item Functioning and Discriminant Validity. For tests of DIF (Morin, Marsh, & Nagengast, 2013), youth's characteristics (sex, country, ID level, and comorbidity) were incorporated into the final measurement model and specified as exogenous predictors. DIF was assessed by comparing three models. The first model (Null) assumes that the predictors are unrelated to the latent factors and the item responses. The second (Saturated) model freely estimates associations between the predictors and item responses, but not between the predictors and the latent factors. A comparison of these two models reveals whether the predictors have some form of influence on item responses. The third (Invariant) model allows the predictors to influence the latent factors, but not the item responses. This model is consistent with the demographic characteristics affecting the latent factors (i.e., discriminant validity) that do not translate into DIF.

2.4.4. Convergent Validity. Convergent validity was assessed by evaluating correlations between the factors estimated as part of the final measurement models with scores obtained on the various measures of youth's psychosocial adjustment.

2.4.5. One-Year Longitudinal Measurement Invariance and Longitudinal Stability. After verifying the extent to which the measurement models estimated using Time 1 responses could be replicated at Time 2, the longitudinal measurement invariance of the final models obtained at the two time-points was systematically assessed (Millsap, 2011). These tests aim to investigate, in sequence, if the factor loadings, response thresholds, item uniquenesses, factor variances and covariances, and means are invariant over time. The most invariant model was then used to obtain estimates of longitudinal (stability) correlations for each latent factor.

2.4.6. Model Fit Assessment. The chi-square test presents a known oversensitivity to sample size and minor misspecifications (Marsh et al., 2005). For this reason, model fit was assessed using recommended fit indices (Hu & Bentler, 1999; Yu, 2002) and following the most recent interpretation guidelines (Marsh et al., 2005; Little, 2013): The Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI). According to current guidelines (Marsh et al., 2005) RMSEA≤.06 and CFI/TLI ≥.95 reflect an excellent fit, whereas RMSEA≤.08 and CFI/TLI ≥.90 reflect an acceptable fit. When comparing alternative models, such as those used in DIF and measurement invariance tests, differences of .010 on the TLI and CFI, and .015 on the RMSEA reflect meaningful differences (Chen, 2007). We also report omega (ω; McDonald, 1970) coefficients of composite reliability for each factor.

3. Results

3.1. Measurement Models (Time 1)

Model fit from the alternative measurement models is reported in Table 2. Beginning with STR, Model 1 resulted in an acceptable level of fit to the data, but in very high correlations between the two teacher-rated (i.e., youth's perspective and teacher's perspective) warmth (r =.764) and conflict (r =.941) factors. These results suggest that teachers seem unable to clearly discriminate between their perspective and the youth's perspective. In Model 2, these two perspectives were collapsed. However, Model 2 resulted in a slight decrease in model fit relative to Model 1, suggesting the need to account for these two perspectives in some manner. This was done in Model 3, where an orthogonal method factor was used to reflect the items on which the teachers were asked to report on youth's perspective. Model 3 resulted in a meaningful increase in model fit relative to Models 1 (ΔCFI/ΔTLI= +.012) and 2 (ΔCFI= +.015; ΔTLI= +.014). The next models (4 and 5) collapsed teachers' and youth's reports into a single warmth factor and a single conflict factor, while accounting for the different informants and perspectives via the incorporation of a partial (Model 4) or complete (Model 5) set of method factors. These two models failed to achieve a satisfactory level of fit, suggesting that teachers' and youth's reports are too different to be combined. Thus, Model 3 was retained for further tests of psychometric validity.

For PCR, both Models 1 and 2 failed to achieve an acceptable level of fit to the data according to the TLI. Model 1 also resulted in correlations matching those for STR in relation to the two parent-rated (i.e., youth's perspective and parent's perspective) warmth (r =.837) and conflict (r =.939) factors, suggesting the need to collapse these factors, but also to find an alternative way to account for these two perspectives. This was achieved in Model 3, which resulted in an acceptable and superior (ΔCFI= +.014; ΔTLI= +.014 to .016) fit to the data, in which an orthogonal method factor was incorporated to account for parental reports of the youth's perspective. Finally, as for STR, models 4 and 5 failed to

achieve a satisfactory level of fit, thus supporting the superiority of Model 3.

Model 3 was thus retained for STR and for PCR. These two solutions (Model 3 for STR and Model 3 for PCR) were then combined in a single model (see Figure 6 of Appendix C). This combined model also achieved a satisfactory level of fit to the data. The parameter estimates from this model are reported in Table 3 (factor loadings and uniquenesses) and in the top section of Table 4 (factor correlations). These results reveal fully comparable and satisfactory parameter estimates showing well-defined and reliable factors reflecting: (a) youth's reports of teacher's warmth (λ=.619-.848; ω=.885) and conflict (λ=.713-.841; ω=.909); (b) youth's reports of parental warmth (λ=.731-.867; ω=.912) and conflict (λ=.653-.794; ω=.888); (c) teachers' reports of warmth (λ=.383-.806; ω=.917) and conflict (λ=.659-.885; ω=.964); (d) parental reports of warmth (λ=.209-.959; ω=.895) and conflict (λ=.444 -.991; ω=.943).

The latent correlations obtained in this model indicate a reasonable degree of differentiation between all factors (see Table 4). These correlations also revealed moderate negative associations between youth's ratings of their relational warmth and conflict with each specific caregiver, which was lower for PCR (*r*=-.309) than STR (*r*=-.574), suggesting clearer disassociations between warmth and conflict at home than at school. In contrast, teachers seemed to be more able to differentiate between warmth and conflict in their relationships involving a specific youth (*r*=-.364) compared to parents (*r*=-.585). Youth self-reports were consistent with a moderate degree of similarity between their report of relational warmth (*r*=.509) and conflict (*r*=.563) with parents and teachers.

3.2. Tests of Differential Item Functioning and Discriminant Validity

Model fit for the alternative models used to test DIF are reported in Appendix D of the Online supplements. Although the null model resulted in an acceptable level of fit, the saturated model resulted in substantial improvement in fit, suggesting that the sex, ID level, country, and comorbidity have some form of effect. Furthermore, these effects did not seem to be entirely captured by associations located at the factor level (i.e., discriminant validity), but also seemed to involve some degree of DIF, as indicated by the substantially reduced level of model fit in the Invariant model relative to the Saturated model. Alternative models were then estimated in which the effects of three out of four predictors were specified as invariant, while the effects of the remaining predictor were allowed to be saturated (suggestive of DIF). These results revealed that DIF was limited to comorbidity, as releasing invariance constraints of this specific characteristic brought the model fit to a level that was almost identical (CFI) or better (TLI) than that of the Saturated model.

Parameter estimates from this model and modification indices from the Invariant model were inspected to locate the specific items involved in this comorbidity-related DIF. This examination revealed that DIF was limited to five items rated by the teachers reflecting relational warmth from the teacher's perspective (items 1a, 2a, 4a, and 6a) and the youth's perspective (item 3b). A final model was thus estimated in which comorbidity was only allowed to influence ratings on these items beyond its effect on the latent factors. The resulting model achieved a level of fit comparable to that of the Saturated model and was retained for interpretation.

The effects of youth characteristics on the latent factors (discriminant validity) and of comorbidity on these five items (i.e., DIF) are reported in Table 5. These results first revealed a lack of associations between sex and comorbidity and any of the relationship factors. Country demonstrated a small positive association with teachers' reports of warmth, suggesting that Australian teachers tend to describe their relationships with their students as warmer than Canadian teachers (corresponding to a small increase of .022 on the standardized latent factor). Finally, ID level demonstrated three positive associations and two negative associations involving specific factors. More precisely, youth with moderate ID levels displayed higher scores than their peers with mild ID levels on their own self-reports of PCR warmth involving their parents (.409 SD) and teachers (.686 SD), and teachers' reports of warmth (.335 SD). Youth with moderate ID levels also reported lower levels of PCR conflict (-.237 SD), and were exposed to lower levels of STR conflict according to teachers' reports (-.408 SD), relative to youth with mild ID level. In relation to DIF, teachers tended to indicate being less likely to share their feelings (item 2a), spend their free time (item 4a), talk about themselves spontaneously (item 6a), and think about (items 1a) youth with comorbid disorders (i.e., greater warmth) relative to their peers without a comorbid condition. In contrast, they also describe these youth as experiencing greater closeness and trust (item 3b).

3.3. Convergent Validity

The correlations between the relationship factors obtained in the final complete measurement model and the various measures of youth's psychosocial adjustment (i.e., depression, anxiety, social avoidance, aggressiveness, and prosocial behavior) are reported in the lower half of Table 4. A more comprehensive coverage of these associations is provided in Appendix E of the online supplements. For purposes of convergent validity, we focus on the main conclusions from these analyses. First, these results reveal a generally higher level of convergent validity within informants than across informants. In particular, teachers' and parents' reports of relational conflict were associated with most outcomes in the expected direction. However, teachers' and parents' reports of relational warmth showed slightly less consistent associations with the outcomes. Furthermore, teachers' reports of relational conflict were positively associated with all outcomes rated by the youth, including prosocial behavior. Youth's reports of STR and PCR conflict were positively associated with their own ratings of the negative outcomes (depression, anxiety, and aggressiveness), whereas their reports of STR and PCR warmth were associated positively with the positive outcome (i.e., prosocial behaviors). Youth's reports of STR warmth were also associated with higher levels of depression and anxiety and lower levels of aggressiveness.

3.4. One-Year Longitudinal Measurement Invariance and Longitudinal Stability

Before assessing longitudinal stability, we first verified whether the results obtained at Time 1 would be replicated at Time 2 by estimating the same five alternative models and testing longitudinal measurement invariance. Details about the fit of the alternative models are reported in the right section of Table 2 and replicated the results obtained at Time 1, leading to retain the same measurement model (Model 3) at Time 2. Parameter estimates from the combined solution including STR and PSR are reported in Tables 3 (loadings and uniquenesses) and 4 (correlations), and also replicate the results obtained at Time 1. A more detailed description of these alternative models, and parameter estimates obtained at Time 2, is provided in Appendix F of the online supplements. Finally, tests of measurement invariance (reported in Appendix D of the online supplements) also supported the complete equivalence of this solution over time.

One-year longitudinal (stability) correlations were taken from the most invariant longitudinal measurement model, and were moderately high and significant ($p \leq 0.01$) for youth-rated: (a) STR warmth (r=.546); (b) STR conflict (r=.613); (c) PCR warmth (r=.602); and (d) PCR conflict (r=.590). It is important to note that these correlations cannot be considered to provide a pure reflection of test-retest reliability, typically assessed over a much shorter time period (i.e., one week to a month) over which scores are expected to stay unchanged. In contrast, the coefficients estimated here rather reflect the one-year longitudinal stability and capture the extent to which these ratings demonstrate some consistency (encompassing both a lack of random measurement error and a lack of true change) over time. In this regard, it is interesting to note that these one-year longitudinal correlations were very high (and significant at $p \leq 0.01$) for parent-rated warmth (r=.795) and conflict (r=.873), but much smaller yet still significant ($p \leq 0.01$) for teacher-rated warmth (r=.433) and conflict (r=.320).

4. Discussion

The main objective of this study was to develop a comprehensive multi-informant measure of relational quality, focused on warmth and conflict, specifically designed for youth with ID. In doing so, we started from Pianta's (2001) measure of STR, which has already had a lasting impact on research among TD youth. The key advantages of this measure, which made it highly relevant to the present study, stem from the availability of a short version validated in English and French, its simplicity, and the ease with which questions could be converted to reflect PCR. More importantly, this study sought to validate a multi-informant measure able to capture the voices and perceptions of all those involved in the target relationship (i.e., youth and their parents, youth with their teachers). Although teachers' and parents' report of STR and PCR, collected using Pianta's measure, have been previously used to assess the perceptions of these caregivers among populations of youth with ID (Blacher et al., 2009; Prino et al., 2016; Roeden et al., 2012; Totsika et al., 2014), no prior study had adapted this scale specifically to assess youth's own perceptions of these relationships. Our results showed that youth with ID are able to bring a valid and complementary perspective to those of their parents and teachers when evaluating the dyadic relationships that they share with these caregivers.

More specifically, our results supported the psychometric properties of this new measure. Our results first showed that youth self-reports provided a distinct and complementary perspective on relationship quality relative to parents' or teachers' reports. Moreover, results also revealed that parents

and teachers could not reliably differentiate their own perspective on these relationships from that of the target youth, thus reinforcing the need to incorporate youth self-reports as part of this comprehensive measure. Second, findings also supported the discriminant validity of this measure in relation to youth characteristics (i.e., sex, ID level, country/language and comorbidities). However, they revealed some DIF on teachers' reports of relational warmth for youth with ID presenting comorbid conditions, thus suggesting that teachers' reports should be used with caution in the presence of comorbid conditions. Third, our results supported the convergent validity of this measure by revealing the presence of well-differentiated relations between all types of reports of relationship quality and indicators of psychosocial adjustment (depression, anxiety, aggressiveness, and prosocial behaviors) reported by youth, teachers, and parents. Finally, the results demonstrated that the factor structure of the resulting comprehensive suite of questionnaires could be replicated one year later and demonstrated moderate to high levels of longitudinal stability for all informants. However, longitudinal stability was smaller for teachers, potentially because they changed over time.

4.1. Multiple-Informants Reveal Complementary Perspectives

A first conclusion was that all three informants had a complementary perspective on STR and PCR. However, teachers and parents were unable to differentiate their own perceptions from their evaluation of the target youth's perception. This result reinforces the unique perspective and voice and agency afforded though the reliance on valid self-reports, which has been previously highlighted in research conducted among TD youth (Bear et al., 2002; Turk et al., 2012; Scott & Havercamp, 2018). This conclusion does not mean that informants' reports are irrelevant. Rather, it indicates that their value stems from their ability to uniquely complement youth self-reports (Prewett et al., 2019).

Second, the level of agreement between youth's, teachers', and parents' ratings of relational warmth and conflict also supports the complementarity of their perspectives. In particular, parents seemed to describe their relationship with the target youth in a more *either* warmth *or* conflictual manner (higher correlations). In comparison, youth were able to report on the warmth and conflict dimensions more independently when describing their relationships with their parents (lower correlations). In contrast, youth and teacher reports seemed to converge on a similar differentiation between ratings of relational warmth and conflict. A final noteworthy observation was related to the relatively high correlation (close to -.500) in youth self-reports regarding the quality of their relationships with their parents and teachers, thus supporting that youth tend to share similar relationships with various adult caregivers (Ciarrochi et al., 2017). This last observation also reinforces the value of combining these self-reports with informant reports to capture similarities and differences between the home and school contexts (Jager, 2011).

4.2. DIF and Discriminant Validity based on Youth Characteristics

In terms of DIF, youth, parent, and teacher relationship measures were found to function equally well for boys and girls, for youth with mild and moderate levels of ID, for English-Australian and French-Canadian youth, and youth without or with comorbidities. A slight exception was found for teachers' evaluation of relational warmth in relation to youth with comorbid conditions, with whom teachers reported sharing their feelings less, spending less free time, and not thinking as much about these youth. In contrast, they also described these youth as being closer and more trusting. These observations may reflect that youth with comorbid conditions often require more time and energy from the teacher due to their greater dependency. However, they also highlight the need for caution when using teacher-ratings of STR warmth with youth presenting a comorbid condition. Despite these observations and our expectations of poorer relationships (Blacher et al., 2009; Totsika et al., 2014), it is promising that comorbid conditions did not influence global ratings of relationship quality provided by any of the informants.

Similarly, sex did not seem to affect STR and PCR. Boys and girls with ID thus seemed to share similar relationships with their teachers and parents. This result is surprising given that some previous studies have shown that girls with ID tend to experience more positive relationships with their teachers (Blacher et al., 2009). However, other studies also found that PCR was unaffected by sex among TD youth (Claes et al., 2003). This lack of sex differences could also indicate the absence of social skills disparities between boys and girls with ID (Duffy & Fuller, 2000).

Unexpectedly, Australian teachers described their relationships with their students as slightly warmer than their Canadian counterparts. This difference was small and limited to teachers' reports of relational warmth. For this reason, this result may reflect cultural or educational differences aligned

with national stereotypes of Australians being more open, friendly, and outgoing relative to Canadians being more reserved and courteous. Given that sex and country differences were not found in youth and parent reports, these results should be interpreted with caution and re-examined in future research.

Among youth characteristics, ID level had the most widespread effects on relationship quality. Youth with moderate ID reported warmer relationships with their parents and teachers than youth with mild ID, a result which was echoed in teachers' reports. These youth also reported sharing less conflictual relationships with their parents, and their teachers also described their relationship as less conflictual. These results were unexpected given that existing research suggest that youth with higher levels of ID tend to share poorer relationships with adults than their peers (Eisenhower et al., 2007). However, these studies were conducted among samples of young children rather than adolescents and young adults with ID. Given the important developmental trends in relationship quality in adolescence compared to childhood, these results might thus not be comparable to those observed in the present study. The present results rather suggest that, due to their increased level of dependency on caregivers, youth with moderate ID levels may come to share a warmer and more affectionate relationship with their primary caregivers. In contrast, parents' perspective on the quality of their relationship with their child remained unaffected by ID level. Alternatively, these results suggest that the normative increase in caregiver conflict typically observed during adolescence (Branje et al., 2004) may be stunted or delayed among youth with moderate ID due to their more limited autonomy. Overall, these findings warrant further investigation.

4.3. Convergent Validity: Relationship Quality and Psychosocial Adjustment

Although the observed pattern of associations proved to be quite complex, it was also very well-differentiated across relationship indicators and informants, thus supporting the convergent validity of these ratings. Importantly, these results supported the value of incorporating multiple informants when seeking to obtain a clearer and richer picture of the role of interpersonal relationships in the psychosocial adjustments of youth with ID.

Despite the complexity of these results, three core conclusions seem to emerge from the observed patterns of associations. First, as expected, informant reports of the outcome variables were most strongly related to their own perceptions of relationship quality. Second, consistent with previous findings, our results revealed that relational conflict was generally more strongly related than relational warmth to reports of depression, anxiety (Longobardi et al., 2019), and aggressiveness (Drugli, 2013; Pinquart, 2017; Roorda & Koomen, 2020). These results support that relational conflict is more harmful to youth's psychological adjustment than a lack of relational warmth. In contrast, reports of prosocial behaviors and social avoidance appeared to be more strongly related to perceptions of relational warmth than to perceptions of relational conflict. Thus, youth sharing high-quality relationships with their caregivers might be better equipped with the confidence and trust needed to securely explore their social environments and engage in helpful behaviors towards others. Third, the results unexpectedly (Babore et al., 2016) revealed that youth rated STR warmth was positively related to their depression and anxiety reports. Keeping in mind that teachers are exposed to many students, this association suggests that reversed causality might be at play: Teachers might provide more support to youth displaying internalizing behaviors (sadness, stress, withdrawal, etc.).

4.4. One-Year Longitudinal Stability

This study provided replication evidence for the factor structure of our measure of relationship quality over one year. Responses obtained one year later by all informants matched the same factor structure, which was completely invariant over time. Estimates of the one-year longitudinal stability of PCR ratings indicates that youth reports of warmth and conflict were both equally and moderately stable over a year, whereas parent reports of the same dimensions were even more stable. As such, both types of reports seem to remain relatively stable, consistent with familial bonds being relatively resilient and stable over time (Branje et al., 2004). These results also suggest that youth's perceptive is subject to more time-structured fluctuations in the quality of these relationships than their parents. These changes might reflect maturation, increases in autonomy, changes in communications, or a combination of these factors. In more practical terms, these results suggest that researchers conducting longitudinal investigations could, without losing too much information, eliminate parental reports after the first measurement point, and only bring them back every few years. Given that it is usually more difficult to reach parents than youth and teachers during large scale longitudinal studies, it might be more cost-effective to strategically plan at which time points parents should be invited to participate to the study.

Moving to STR, youth's perspective again demonstrated moderately high levels of longitudinal stability over a one-year period. This result may reflect youth's natural tendencies to carrying over their relational working models and expectations from the PCR to the STR (Bowlby, 1973), but more realistically, a tendency to use past experiences with previous teachers as filters via which to consider new relationships. These mechanisms suggest that only marked changes in relationship patterns may result in visible changes in youth's perceptions. In contrast, and as anticipated, teacher-rated STR was far less stable over time. This is consistent with homeroom teachers changing annually and reinforce the value of maintaining teachers' reports over time in the context of longitudinal research, as these might be more sensitive to time-structured fluctuations than youth's reports.

4.5. Limitations

The current study presents limitations. First, although we found that our results using a sample of youth with ID were similar to results obtained in studies using samples of TD youth, no comparison sample of TD youth was considered, thus making any claim of generalizability or difference tentative at best. Second, the present study relied on youth from two countries sharing a very similar culture and is thus unable to account for possible cultural differences in relationship quality and perceptions of what is relationally most desirable. Future work is also needed to verify the generalizability of our findings to more diversified samples of youth with ID, from a greater variety of countries and cultures. Third, while the current study allowed to verify the replicability of the factor structure over a one-year interval, tests of discriminant and convergent validity remained cross-sectional in nature, and thus unable to inform questions related to the directionality of the observed associations. Moreover, although the measures of anxiety and depression used to assess convergent validity of our main instrument were already validated for a population of youth with ID, we relied on adapted versions of our measures of aggressiveness and prosocial behaviors that have never been validated for self-report among samples of youth with ID (Goodman et al., 1998; Institut de la Statistique du Québec, 2006, 2008). These scales are currently undergoing a psychometric validation process for self-report among youth with ID. As a result, tests of convergent validity involving youth self-reports on these two scales should be considered with caution pending additional psychometric evidence of the quality of these measures. Besides, to better understand how relationship quality is predicted by and predicts psychosocial outcomes, future studies should rely on fully longitudinal research designs, making it possible to explicitly consider change, and the shape of change, in variables of interest as it occurs over time. Fourth, most participants (>90%) attended special schools or special classrooms, and had one teacher with whom they spent most of their time. These youth completed the STR items in relation this this teacher, who was also the one who completed the teacher's questionnaire. However, the minority of participants attending a regular classroom are exposed to a variety of teachers. As a result, they were asked to select the one that was the most significant for them in completing the STR items. However, for these students, the teacher's questionnaire was completed by the homeroom teacher, who held administrative responsibility for the student and who might have differed from the one picked by the student. As a result, this discrepancy might have contributed to increase the deviation in ratings between students and teachers reports of STR. Finally, relationships with peers are another key aspect of youth's social life. For this reason, it would be interesting for future research to try and extend the present work to relationships with peers and other teachers.

5. Conclusion

The present study aimed to create and validate a comprehensive multi-informant measure of relationship quality specific to youth with ID. Our results are encouraging regarding the ability of this new set of measures to accurately capture relationship quality among youth with mild to moderate levels of ID. Relying on a cross-cultural sample of Canadian and Australian youth with ID, the present study was also able to establish the adequacy of a French and English version of this comprehensive measure, showing that it could be confidently used in both languages (with no risk of DIF) to assess relationship quality. This measure proved to be reliable and valid across the various verifications conducted as part of this study, and although the need to replicate the present results remains, this measure can now be confidently used to assess relationship quality among youth with ID. Despite this promising conclusion, some additional recommendations are in order. First, the results showed that caution is required when using the teacher-rated items assessing relational warmth among youth with ID presenting comorbid conditions. Second, longitudinal studies might not need to rely on annual parental reports of relationship quality, given their one-year longitudinal stability. However, youth and teacher reports should be

administered regularly (at least annually) to obtain an accurate picture of relationship changes. We hope that future research using tools like the one developed here will help researchers and practitioners construct interventions to protect youth with ID from psychosocial adjustment problems, as well as contribute to provide youth with ID with a voice and agency in a research context where current methodology privileges informant reports.

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Table 1

Description of the Measures Used to Assess Psychosocial Adjustment

	Instrument	n items	Example	Response scale	α
Youth-rated Scales					
Depression	GDSID	21	"In the past week, I feel sad or depressed,"	4-point scale: "Never" to "Always"	Canada: .875 Australia: .890
General anxiety	GAS-ID	27	"In the past week, I worry a lot."	4-point scale: "Never" to "Always"	Canada: .937 Australia: .916
Aggressiveness	QLSCD	5	"Over the past week, you became physically aggressive when teased."	6-point scale: "Never" to "5 times or more"	Canada: .720 Australia: .843
Prosocial	SDQ	5	"Over the past week, you helped others."	6-point scale: "Never" to "5 times or more"	Canada: .786 Australia: .781
Teacher-rated Scales					
Depression	GDSID	16	"In the past week, has your student appeared depressed,"	5-point scale: "Never" to "Very often"	Canada: .791 Australia: .846
Depressive mood	ADAMS	7	Over the last month, this student was… "Sad"	5-point scale: "No problem" to "Major problem"	Canada: .746 Australia: .860
General anxiety	ADAMS	7	Over the last month, this student was… "Nervous"	5-point scale: "No problem" to "Major problem"	Canada: .881 Australia: .860
Social avoidance	ADAMS	7	Over the last month, this student was… "Withdrawn from other people"	5-point scale: "No problem" to "Major problem"	Canada: .804 Australia: .860
Aggressiveness	QLSCD	8	"During the last month, this student has physically attacked other students."	5-point scale: "Never" to "Very often"	Canada: .885 Australia: .923
Prosocial	SDQ	8	"During the last month, this student was kind to other students."	5-point scale: "Never" to "Very often"	Canada: .845 Australia: .900
Parent-rated Scales					
Depression	GDSID	16	"In the past week, has your child appeared depressed"	5-point scale: "Never" to "Very often"	Canada: .742 Australia: .845
Depressive mood	ADAMS	7	Over the last month, your child was… "Sad"	5-point scale: "No problem" to "Major problem"	Canada: .805 Australia: .837
General anxiety	ADAMS	7	Over the last month, your child was… "Nervous"	5-point scale: "No problem" to "Major problem"	Canada: .820 Australia: .922
Social avoidance	ADAMS		Over the last month, your child was…"Withdrawn from other people"	5-point scale: "No problem" to "Major problem"	Canada: .820 Australia: .922
Aggressiveness	QLSCD	8	"During the last month, my child has scared other children to get what he/she wanted."	5-point scale: "Never" to "Very often"	Canada: .862 Australia: .912
Prosocial	SDQ	8	"During the last month, my child has often volunteered to help others."	5-point scale: "Never" to "Very often"	Canada: .833 Australia: .868

Note. GDSID=Glasgow Depression Scale for People with Intellectual Disabilities (Cuthill et al., 2003); GAS-ID=Glasgow Anxiety Scale for People with Intellectual Disabilities (Mindham & Espie 2003); ADAMS=Anxiety, Depression and Mood Screen (Esbensen et al., 2003); QLSCD=Quebec Longitudinal Study of Child Development (Institut de la Statistique du Québec, 2006, 2008); SDQ=Strength and Difficulties Questionnaire (Goodman et al., 1998).

Table 2

Goodness-of-Fit Results for Alternative Measurement Models at Time 1 and Time 2.

Models	χ^2	df	CFI	TLI	RMSEA (90% CI)	χ^2	df	CFI	TLI	RMSEA (90% CI)
	Measurement Models at T1					*Measurement Models at T2*				
STR Model										
Model 1	1750.415*	654	.922	.912	.066 [.062; .069]	1251.153*	654	.911	.900	.059 [.054; .064]
Model 2	1799.164*	663	.919	.910	.066 [.063; .070]	1265.045*	663	.911	.900	.059 [.054; .064]
Model 3	1581.516*	648	.934	.924	.061 [.057; .065]	1134.518*	648	.928	.917	.053 [.048; .059]
Model 4	2235.744*	641	.887	.869	.080 [.076; .083]	1213.027*	641	.915	.902	.058 [.053; .063]
Model 5	2249.321*	642	.886	.868	.080 [.077; .084]	1215.960*	642	.915	.902	.058 [.053; .063]
PCR Model										
Model 1	1268.965*	654	.907	.894	.051 [.047; .055]	953.858*	654	.931	.922	.043 [.037; .048]
Model 2	1277.232*	663	.907	.896	.051 [.046; .055]	984.291*	663	.926	.917	.044 [.038; .049]
Model 3	1168.683*	648	.921	.910	.047 [.043; .051]	883.115*	648	.946	.938	.038 [.031; .044]
Model 4	1225.522*	641	.911	.897	.050 [.046; .054]	1001.575*	641	.917	.904	.047 [.041; .053]
Model 5	1228.974*	642	.911	.897	.050 [.046; .054]	1011.149*	642	.915	.902	.048 [.042; .053]
Complete Model										
Model 3	3705.939*	2687	.935	.928	.031 [.029; .033]	3219.361*	2687	.931	.923	.027 [.023; .030]

Note. *$p < .01$; χ^2: STR: Student-teacher relationship; PCR: Parent-child relationship; WLSMV chi-square; df: Degrees of freedom; CFI: Comparative fit index; TLI: Tucker-Lewis index; RMSEA: Root mean square error of approximation; 90% CI: RMSEA 90% confidence interval.

Table 3

Results from the Complete Measurement Model Estimated at Time 1 and Time 2.

	Youth STR T1		Teacher STR T1			Youth PCR T1		Parent PCR T1			Youth STR T2		Teacher STR T2			Youth PCR T2		Parent PCR T2		
	λ	δ	λ	MF λ	δ	λ	δ	λ	MF λ	δ	λ	δ	λ	MF λ	δ	λ	δ	λ	MF λ	δ
Warmth items																				
W1a	.649*	.579*	.529*		.720*	.732*	.464*	.448*		.799*	.638*	.593*	.455*		.793*	.717*	.486*	.684*		.532*
W1b			.384*	.379*	.709*			.209*	.438*	.765*			.239*	.582*	.604*			.296*	.480*	.682*
W2a	.694*	.518*	.784*		.385*	.731*	.465*	.405*		.836*	.690*	.523*	.667*		.555*	.667*	.555*	.614*		.623*
W2b			.489*	.640*	.351*			.511*	.521*	.467*			.445*	.613*	.427*			.363*	.688*	.394*
W3a	.840*	.295*	.806*		.350*	.817*	.332*	.699*		.512*	.946*	.104*	.863*		.255*	.875*	.234*	.908*		.175*
W3b			.738*	.546*	.156*			.796*	.187*	.332*			.723*	.599*	.119*			.633*	.616*	.220*
W4a	.619*	.617*	.692*		.521*	.818*	.331*	.679*		.539*	.505*	.745*	.697*		.514*	.787*	.380*	.462*		.787*
W4b			.504*	.354*	.621*			.594*	.425*	.467*			.551*	.390*	.544*			.347*	.309*	.784*
W5a	.828*	.315*	.758*		.425*	.867*	.248*	.959*		.080*	.837*	.299*	.585*		.657*	.930*	.136*	.824*		.320*
W5b			.770*	.130*	.390*			.918*	.176*	.126*			.634*	.321*	.495*			.748*	.315*	.341*
W6a	.848*	.282*	.775*		.399*	.807*	.349*	.492*		.758*	.710*	.496*	.753*		.433*	.841*	.292*	.634*		.598*
W6b			.504*	.577*	.413*			.478*	.614*	.394*			.343*	.620*	.498*			.416*	.617*	.447*
ω	.885		.917			.912		.895			.872		.891			.917		.890		
Conflict items																				
C1a	.721*	.480*	.848*		.281*	.679*	.539*	.870*		.243*	.746*	.444*	.826*		.318*	.794*	.370*	.939*		.119*
C1b			.765*	-.054	.412*			.742*	-.036	.449*			.700*	-.377*	.368*			.840*	-.154*	.271*
C2a	.721*	.481*	.804*		.353*	.794*	.370*	.991*		.018*	.718*	.484*	.725*		.474*	.783*	.387*	.851*		.276*
C2b			.760*	-.518*	.155*			.750*	-.243*	.379*			.614*	-.577*	.291*			.712*	-.495*	.248*
C3a	.800*	.360*	.864*		.254*	.681*	.536*	.689*		.525*	.738*	.455*	.835*		.303*	.667*	.555*	.793*		.371*
C3b			.659*	-.510*	.305*			.627*	-.196*	.569*			.631*	-.495*	.356*			.794*	-.140*	.350*
C4a	.813*	.339*	.885*		.217*	.653*	.573*	.834*		.305*	.830*	.310*	.865*		.252*	.571*	.674*	.720*		.481*
C4b			.867*	-.008	.248*			.763*	.127	.401*			.824*	.053	.318*			.781*	.193*	.353*
C5a	.753*	.433*	.816*		.334*	.793*	.371*	.726*		.472*	.769*	.408*	.795*		.368*	.766*	.413*	.710*		.497*
C5b			.743*	.238*	.391*			.664*	.421*	.381*			.832*	.245*	.248*			.726*	.414*	.302*
C6a	.713*	.492*	.850*		.278*	.758*	.425*	.665*		.558*	.683*	.533*	.952*		.094*	.744*	.446*	.760*		.423*
C6b			.767*	.039	.410*			.444*	.369*	.667*			.849*	.159*	.254*			.633*	.236*	.543*
C7a	.841*	.293*	.721*		.480*	.738*	.456*	.632*		.600*	.776*	.398*	.655*		.571*	.677*	.542*	.624*		.611*
C7b			.699*	.280*	.432*			.592*	.443*	.454*			.765*	.229*	.362*			.660*	.208*	.521*
ω	.909		.964			.888		.943			.902		.963			.880		.955		

Note. *p < .05; STR: Student-teacher relationship; PCR: Parent-child relationship; λ: Loading; δ: Item uniqueness; ω=Omega coefficient of composite reliability. All items are listed in Table S1 of the Online supplements; a: informant report of the perspective of the informant toward the youth; b: informant reports of the perspective of the youth toward the informant; MF: Method factor.

Table 4

Latent Correlations from the Complete Models (Time 1 and Time 2) and Correlations between Relationship Quality and Psychosocial Adjustment.

	1. Youth STR Warmth	2. Youth STR Conflict	3. Teacher STR Warmth	4. Teacher STR Conflict	5. Youth PCR Warmth	6. Youth PCR Conflict	7. Parent PCR Warmth	8. Parent PCR Conflict
Correlations within between relationship factors within time points								
1. Youth STR Warmth	—	-.574**	.185**	-.150*	.509**	-.168**	.243**	-.246**
2. Youth STR Conflict	-.528**	—	-.267**	.227**	-.225**	.563**	-.170*	.127
3. Teacher STR Warmth	.318**	-.170	—	-.364**	-.011	-.035	.174	-.057
4. Teacher STR Conflict	.003	.006	-.434**	—	-.098	.168**	-.171	.116
5. Youth PCR Warmth	.600**	-.264**	.248**	.174	—	-.309**	.297**	-.216*
6. Youth PCR Conflict	-.301**	.480**	-.168	-.021	-.360**	—	-.154	.221*
7. Parent PCR Warmth	.350**	-.139	.027	-.219	.188	-.059	—	-.585**
8. Parent PCR Conflict	-.244*	.124	.007	.434**	-.267**	.164	-.725**	—
Correlations between relationship factors and psychosocial adjustment at T1								
Youth-rated								
Depression	**.186****	**.258****	-.141*	.269**	**.097**	**.397****	.092	-.133
Anxiety	**.145****	**.285****	-.090	.187**	**.022**	**.444****	.056	-.238**
Prosociality	**.215****	**.055**	-.064	.188**	**.300****	**.044**	.093	-.030
Aggressivity	**-.101***	**.318****	-.079	.238**	**-.073**	**.343****	-.221*	.315**
Teacher-rated								
Depression	-.004	.157*	**.001**	**.453****	-.003	.152*	-.173	.145
General Anxiety	.031	.077	**.065**	**.159****	-.006	.065	-.055	.069
Social Avoidance	.024	.105	**-.227****	**.116***	-.018	.105	-.231**	.165
Depressed Mood	.013	.053	**.069**	**.222****	.025	.117	-.154	.166
Prosociality	.111	-.233**	**.312****	**-.296****	.092	-.077	.247**	-.090
Aggressivity	-.120	.224**	**-.098**	**.382****	-.041	.180**	-.228*	.146
Parent-rated								
Depression	-.174*	.139	.106	-.067	-.071	.188*	**-.074**	**.350****
General Anxiety	.020	-.194**	.074	-.223*	.075	-.159*	**.116**	**.241****
Social Avoidance	-.089	.015	-.272**	-.117	-.171	.051	**-.128**	**.128**
Depressed Mood	-.011	-.006	.085	-.123	.107	-.047	**.115**	**.222****
Prosociality	-.003	-.114	-.055	-.218*	.189*	-.118	**.403****	**-.228****
Aggressivity	.145	-.027	.134	.188*	.059	.017	**.074**	**.268****

Note. *$p < .05$; **$p < .01$; STR: Student-teacher relationship; PCR: Parent-child relationship; On the top part of the table, correlations at T1 are reported above the diagonal and correlations at T2 are reported below the diagonal. On the bottom part of the table, correlations within the same informant are displayed in bold.

Table 5

Associations between Youth's Characteristics, the Latent Factors, and Item Responses.

	Sex			ID Level			Country			Comorbidity		
	b	*s.e.*	*β*	*b*	*s.e.*	*β*	*b*	*s.e.*	*β*	*b*	*s.e.*	*β*
Latent Factors												
Youth-rated PCR Warmth	-.086	.237	-.041	.409	.117**	.219	.004	.007	.055	.103	.251	.047
Parent-rated PCR Warmth	-.158	3.430	-.054	.435	.158	.166	-.072	.047	-.765	.765	.915	.249
Youth-rated STR Wamth	-.208	.447	-.093	.686	.123**	.346	.008	.015	.110	-.432	.337	-.185
Teacher-rated STR Wamth	-.011	1.080	-.005	.335	.153*	.169	.022	.009*	.310	-.818	.746	-.351
Youth-rated PCR Conflict	.012	.145	.006	-.237	.117*	-.129	.002	.003	.034	-.281	.233	-.130
Parent-rated PCR Conflict	.067	.516	.032	-.279	.153	-.150	-.010	.021	-.150	-.033	.395	-.015
Youth-rated STR Conflict	.037	.333	.018	-.180	.109	-.098	-.006	.005	-.089	.159	.270	.074
Teacher-rated STR Conflict	.057	.628	.025	-.408	.155**	-.201	.014	.010	.186	-1.096	.631	-.460
Item Responses (Teacher-rated STR)												
Item 1a (Warmth; Teacher perspective)										-1.612	.645*	-.525
Item 2a (Warmth; Teacher Perspective)										-1.501	.568**	-.439
Item 4a (Warmth; Teacher Perspective)										-1.231	.493*	-.384
Item 6a (Warmth; Teacher Perspective)										-2.037	.814	-.519
Item 3b (Warmth; Youth Perspective)										2.077	.882*	.435

Note. *$p < .05$; **$p < .01$; STR: Student-teacher relationship; PCR: Parent-child relationship; ID: Intellectual disability; *b*: Unstandardized regression coefficient; s.e.: Standard error of the coefficient; *β*: Standardized regression coefficient. All items are listed in Table S1 of the Online supplements.

Online Supplements for

Toward a Comprehensive Assessment of Relationships with Teachers and Parents for Youth with Intellectual Disabilities

Appendix A
Scale Development: Pilot Procedures

Objectives

The first objective of these pilot procedures were to examine the appropriateness of the format and clarity of the short version (Morin et al., 2009, 2013) of the Student-Teacher Relationship Scale (STRS; Pianta, 2001) and its adaptation to assess parent-child relationships (Totsika et al., 2014), for use as self-report measure among youth with ID. Importantly, the questionnaire from which these items were taken were already available in French and English. Following this initial verification, the youth-reported items were adapted to increase their clarity and ease of application based on recommendations related to the use of self-report questionnaires among people with ID (Finlay & Lyons, 2001, 2002). This preliminary adaptation was then tested among a first sample of youth with ID, which led to further adaptations. The final adaptation was tested again among a second sample of youth with ID. After identifying the optimal wording among youth with ID, matching sets of items were developed to represent (1) teachers' perception of their relationship with the target child when taking the perspective of the child, (2) teachers' perception of their relationship with the target child from their own perspective, (3) parents' perception of their relationship with their child when taking the perspective of the child, and (4) parents' perceptions of their relationship with their child from their own perspective. As such, variations in wording from the original STRS (Pianta, 2001) for all three versions (youth, teacher, and parent) are due to this extended adaptation process.

Method

Participants and Procedures. The pilot sample included 34 youth (aged between 13 and 21 years; 35% girls) with mild to moderate-severe ID, including 20 English-speaking Australians and 14 French-speaking Canadians. A first subsample of 18 youth (N = 10 in Australia and 8 in Canada) was solicited to evaluate the format and clarity of a preliminary adaptation of our measure. A second subsample of 16 youth (N = 10 in Australia and 6 in Canada) was solicited to assess the format and clarity of the final adapted version of our questionnaire. The procedures used in this pilot study were identical to those used in the main study, and received approval from the same research ethics committees. However, in the pilot process, the STR and PCR items were administered individually to youth, at school, by a trained research assistant using a read-aloud assisted procedure to maximize youth's understanding and to facilitate discussion. Youth had to report their answer by circling their choice on a paper and pen questionnaire. The administration was mainly focused on assessing the level of understanding of the youth and the ease with which they could respond to the items.

Measures. A preliminary assessment of the format and clarity of the items was conducted by all members of the research team familiar with the use of self-report questionnaires among youth with ID. This preliminary assessment revealed that the STR and PCR item format (i.e., affirmative rather than interrogative) was adequate to use as in a self-reported questionnaire among youth with ID. A related concern was youth's tendencies to respond in an extreme either-or manner (i.e., Yes or No), rather than as a matter of degree. Also, the original STRS comprises a five-point response scale (1 = "definitely does not apply" to 5 = "definitely applies") which was potentially difficult to understand by youth with ID. For this reason, the response scale was replaced by a simpler response scale asking students to indicate their agreement with each item using a five-point rating scale ranging from 1 = "Totally disagree", 2 = "Disagree", 3 = "In between", 4 = "Agree", and 5 = "Totally agree". To further increase youth's understanding of the verbal anchors of the response scale, a graphical five-point response scale was added above the words (i.e., ranging from "Totally disagree" associated with a "very unhappy face" to "Totally agree" associated with a "very happy face"). The original, and revised, response scale was inspired by the Wong–Baker facial pain rating scale (Wong & Baker 1988). Moreover, to support youth's understanding of the items, words from the items were also associated with pictograms (presented above the words). Additionally, a "do not understand the statement" option was added to the response scale for situations in which respondents remained unable to understand the item. During this process, decisions were taken by consensus among research team members, as well as through consultation with school personnel (i.e., teachers, psychologists, and psycho-educators) familiar with youth with ID. The resulting version of our questionnaire, following this initial adaptation, was administered to the first pilot sample of students.

Results

The responses provided by the first subsample of youth revealed that some words used in some of the items were hard to understand for youth with ID (more specifically by those with more severe levels of ID). These results also revealed that the adjusted response scale seemed easy to understand for all participants, but that some participants still tended to respond to the items via a simpler "yes" or "no". Therefore, to further increase youth's understanding of the five-point graphical response scale, words were added above the pictograms (i.e., the "very unhappy" to "very happy" faces) to correspond to youth's natural tendencies to respond by "yes" or "no". As such, the 1 and 2 options were placed under "No, I", and 4 and 5 options were placed under "Yes, I", and the 3 option was placed under "Sometimes yes/no." Finally, a template comprising a graphical display and pictograms was developed to explain to youth how to use the response scale.

The revised version was administered to the second subsample of youth. Results supported the adequacy of the final French and English adapted versions assessing STR and PCR and proved their suitability for use as self-report instruments among youth with ID. Matching sets of items were then developed for teachers and parents.

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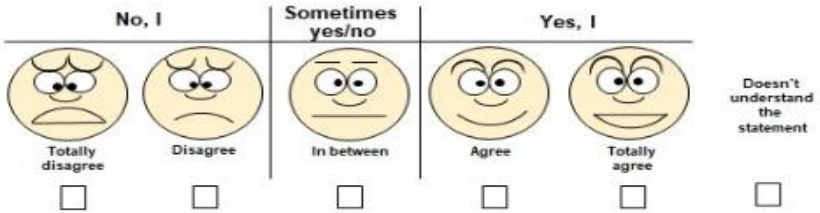
Appendix B
Complete List of Items for the Measures of Student-Teacher and Parent-Child Relationship

Item	*Youth-report*	*Teacher-report: Youth perspective*	*Teacher-report: Own perspective*
		Student-Teacher Relationship Scale	
Warmth			
W1	I sometimes think nice things about my teacher when I am not at school.	This student tells me that he/she sometimes think about me when he/she are not at school.	I sometimes think about this student when I'm not at school.
W2	I talk to my teacher about my feelings and what happens to me.	This student sometimes shares his/her feelings and personal experiences with me.	I sometimes share my feelings and personal experiences with this student.
W3	I trust my teacher.	This student feels close to me and trusts me.	I feel close to this student and trust him/her.
W4	I sometimes spend my free time with my teacher.	Sometimes, this student shares his/her free time with me.	Sometimes, I share free time with this student.
W5	My teacher is nice and friendly to me.	This student shares a warm and friendly relationship with me.	I have a warm and friendly relationship with this student.
W6	I can easily talk about myself with my teacher.	This student talks about himself/herself spontaneously with me.	I talk about myself spontaneously with this student.
Conflict			
C1	I don't really like my teacher.	This student doesn't seem to like me very much.	I usually don't like this student very much.
C2	My teacher does not respect me.	This student doesn't feel respected by me.	I don't feel respected by this student.
C3	I often argue with my teacher.	It takes this student a lot of energy to discuss and negotiate with me.	I need a lot of energy to discuss and negotiate with this student.
C4	I often get angry at my teacher.	This student easily gets mad at me.	I get mad at this student easily.
C5	Sometimes, my teacher is unfair with me.	Sometimes, this students feels unfairly treated by me.	I sometimes feel unfairly treated by this student.
C6	My teacher thinks that I am a difficult or disobedient student.	This student has trouble getting along with me.	I have difficulty getting along with this student.
C7	My teacher often gets angry at me.	This student is frequently in conflict with me.	I'm frequently in conflict with this student.
		Parent-Child Relationship Scale	
	Youth-report	*Parent-report: Youth perspective*	*Parent-report: Own perspective*
Warmth			
W1	I sometimes think nice things about my parents when I am at school.	My child sometimes thinks about me when he/she is at school.	I sometimes think about my child when he/she is at school.
W2	I talk about my feelings and what happens to me with my parents.	My child sometimes shares his/her feelings and personal experiences with me.	I sometimes share my feelings and personal experiences with my child.
W3	I trust my parents.	My child feels close to me and trusts me.	I feel close to my child and trust him/her.
W4	I sometimes spend my free time with my parents.	Sometimes, my child shares his/her free time with me.	Sometimes, I share my free time with my child.
W5	I have a good relationship with my parents.	My child has a warm and friendly relationship with me.	I have a warm and friendly relationship with my child.
W6	I can easily talk about myself with my parents.	My child talks about himself/herself spontaneously with me.	I talk about myself spontaneously with my child.
Conflict			
C1	I do not like my parents very much.	My child doesn't seem to like me very much.	I usually don't like my child very much.
C2	My parents do not respect me.	My child doesn't feel respected by me.	I don't feel respected by my child.
C3	I often argue with my parents.	It takes my child a lot of energy to discuss and negotiate with me.	I need a lot of energy to discuss and negotiate with my child.
C4	I often get angry at my parents.	My child gets mad at me easily.	I get mad at my child easily.
C5	Sometimes, my parents are unfair with me.	Sometimes, my child feels unfairly treated by me.	I sometimes feel unfairly treated by my child.
C6	My parents think that I am difficult or disobedient.	My child has trouble getting along with me.	I have difficulty getting along with my child.
C7	My parents often get angry at me.	My child is frequently in conflict with me.	I'm frequently in conflict with my child.
Answer scales	See next page	Strongly disagree Disagree Neutral Agree Strongly agree	Strongly disagree Disagree Neutral Agree Strongly agree

Answer scales for youth self-reports:



Appendix C

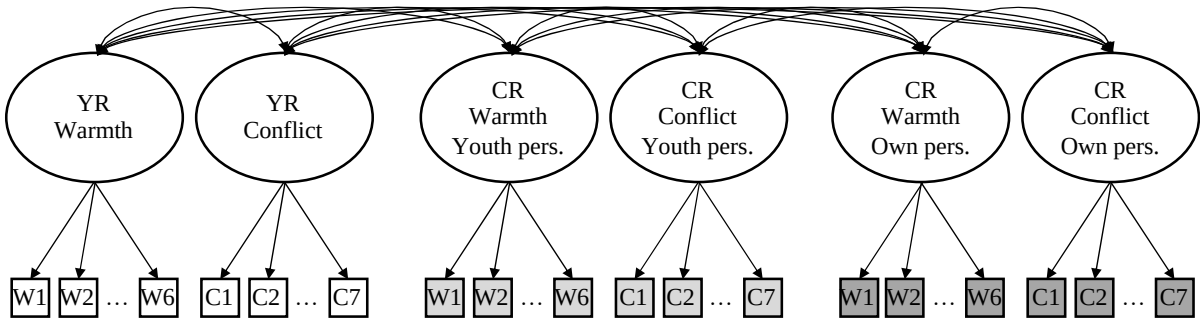


Figure 1. Measurement Model 1 of STR or PCR Youth and Caregiver Rated (Teacher or Parent) Relationship.
Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. YR: youth report; CR: caregiver report (teacher or parent); W: warmth; C: conflict. A priori correlated uniquenesses between parallel worded items are not displayed.

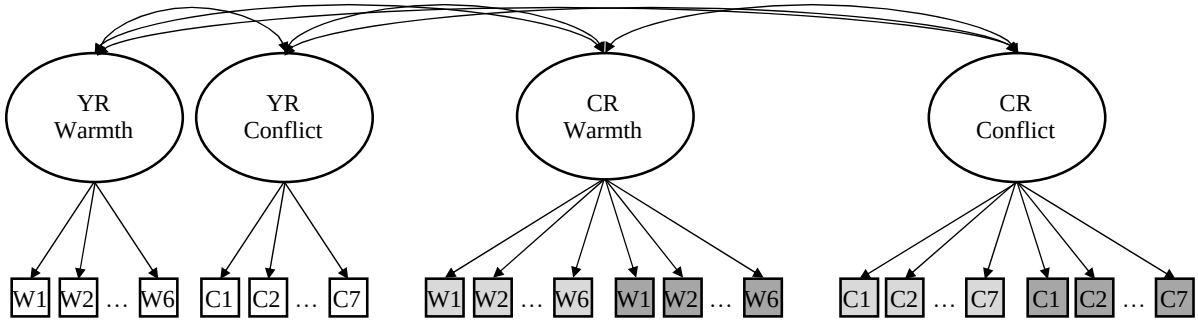


Figure 2. Measurement Model 2 of STR or PCR Youth and Caregiver Rated (Teacher or Parent) Relationship.
Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. YR: youth report; CR: caregiver report (teacher or parent); W: warmth; C: conflict. A priori correlated uniquenesses between parallel worded items are not displayed.

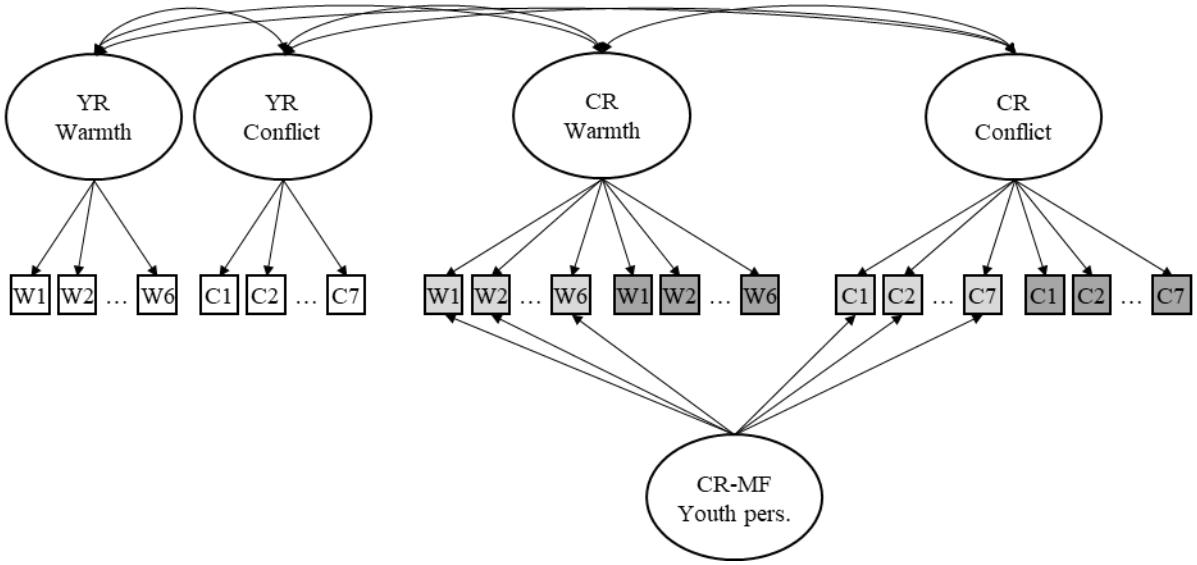


Figure 3. Measurement Model 3 of STR or PCR Youth and Caregiver Rated (Teacher or Parent) Relationship.
Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. YR: youth report; CR: caregiver report (teacher or parent); W: warmth; C: conflict; MF: method factor; Pers.: perspective. A priori correlated uniquenesses between parallel worded items are not displayed.

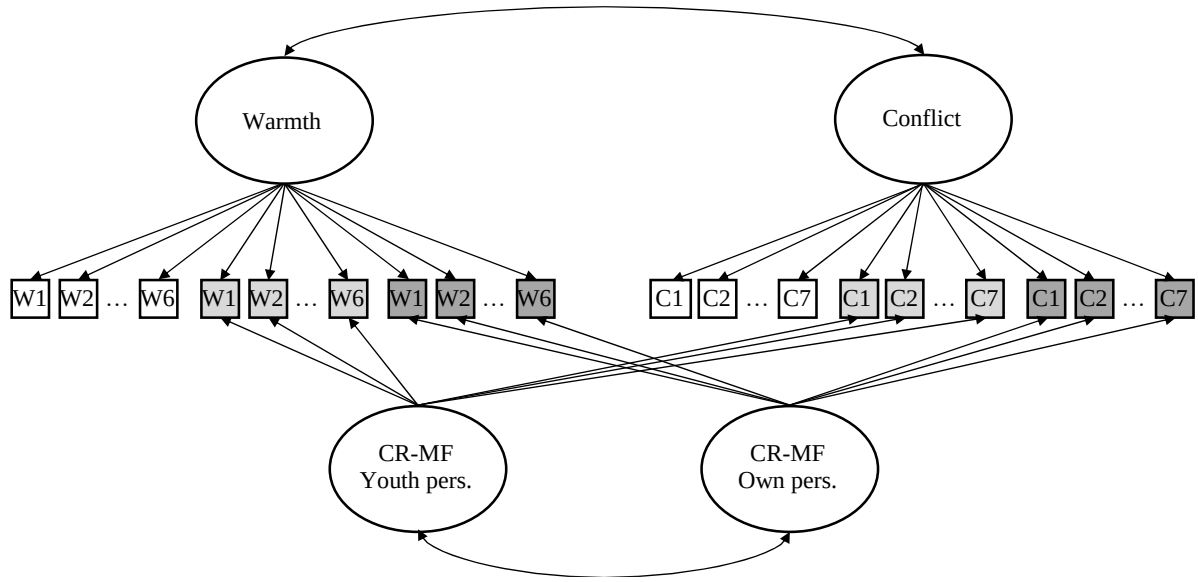


Figure 4. Measurement Model 4 of STR or PCR Youth and Caregiver Rated (Teacher or Parent) Relationship.
Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. YR: youth report; CR: caregiver report (teacher or parent); W: warmth; C: conflict; MF: method factor; Pers.: perspective. A priori correlated uniquenesses between parallel worded items are not displayed.

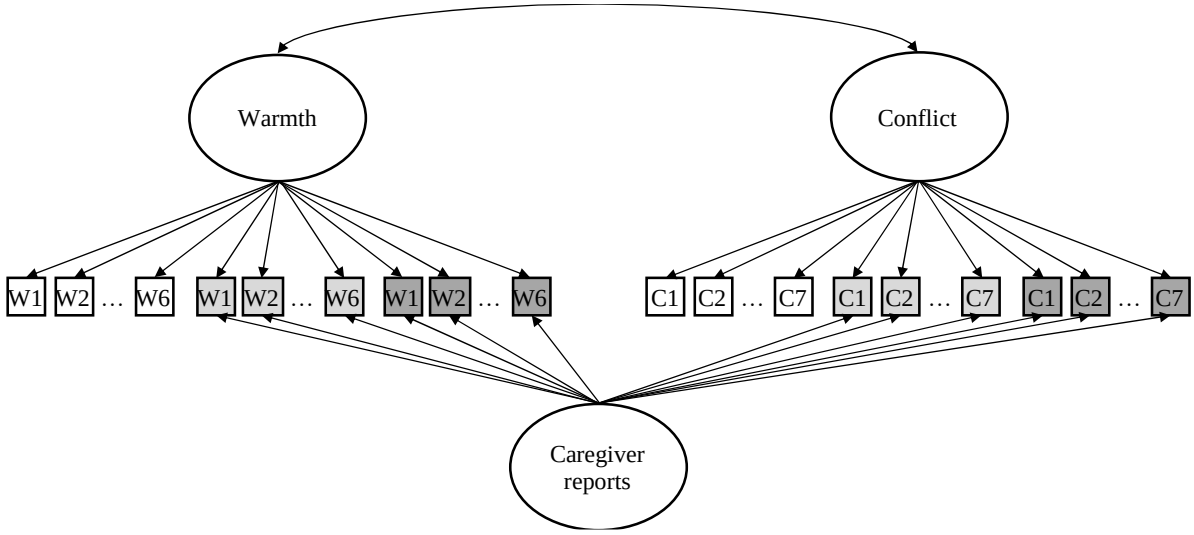


Figure 5. Measurement Model 5 of STR or PCR Youth and Caregiver Rated (Teacher or Parent) Relationship.
Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. W: warmth; C: conflict; MF: method factor. A priori correlated uniquenesses between parallel worded items are not displayed.

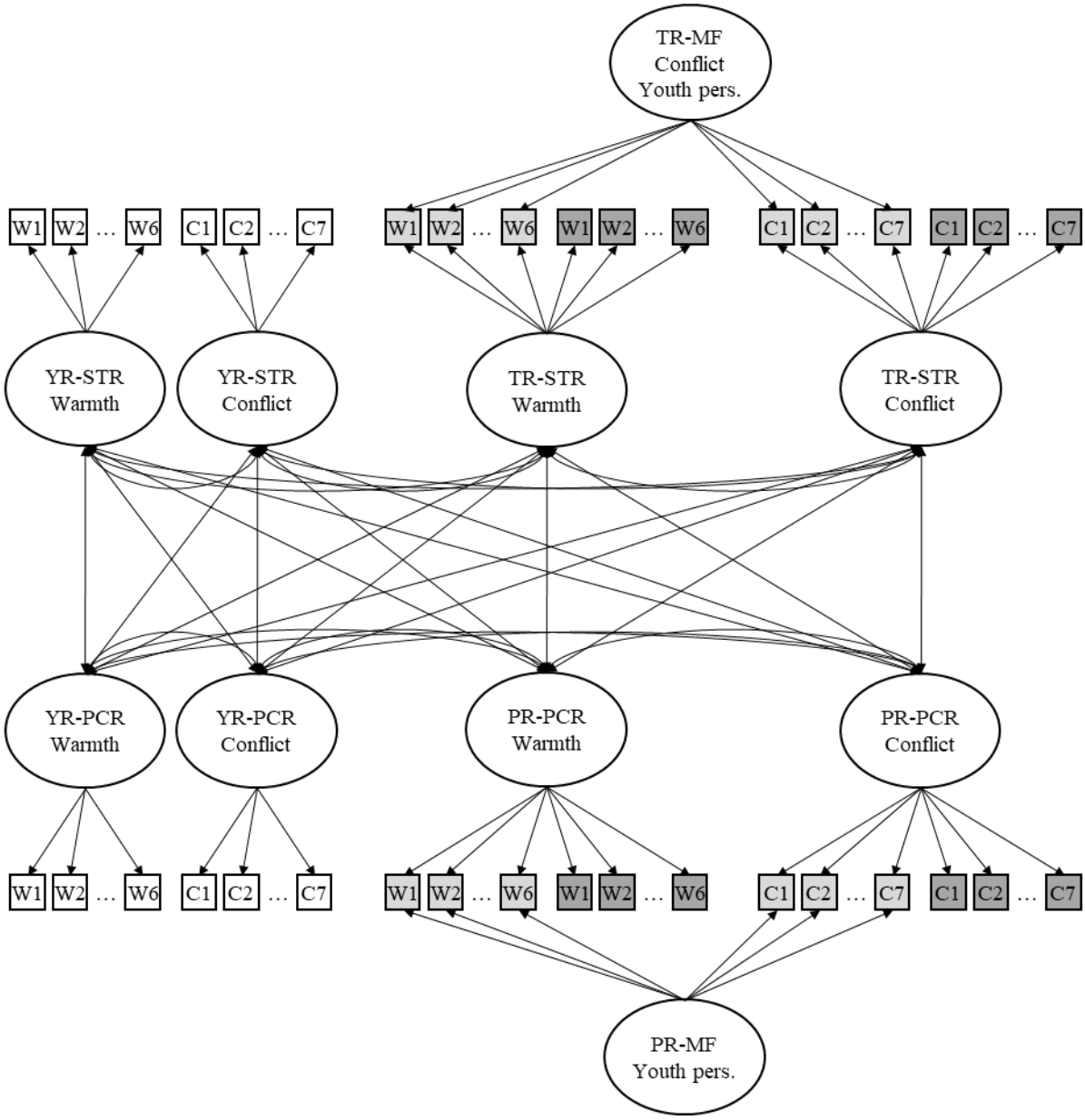


Figure 6. Final Measurement Representing a Combination of Model 3 for STR and PCR Youth, Teacher, and Parent Reports.

Note. Items displayed in white represent youth reports, items displayed in light gray represent caregiver reports of their perception of youth's perspective, items displayed in dark gray represent caregiver reports of their own perspective. W: warmth; C: conflict; MF: method factor. A priori correlated uniquenesses between parallel worded items are not displayed.

Appendix D

Goodness-of-Fit Results and Model Comparison for the MIMIC Models at Time 1 and Longitudinal Measurement Invariance.

Models	χ^2	df	CFI	TLI	RMSEA (90% CI)	CM	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
MIMIC											
1. Null	4359.884*	3081	.916	.907	.032 [.030; .035]	—	—	—	—	—	—
2. Saturated	3757.239*	2769	.934	.919	.030 [.028; .032]	1			+.018	+.012	-.002
3. Invariant	4314.531*	3041	.915	.904	.033 [.030; .035]	2	700.182*	272	-.019	-.003	+.003
4. Partial Invariance (DIF Sex)	4125.715*	2973	.923	.912	.031 [.029; .034]	2	481.712*	204	-.011	-.007	+.001
5. Partial Invariance (DIF ID level)	4062.932*	2973	.927	.916	.030 [.028; .033]	2	422.905*	204	-.007	-.003	.000
6. Partial Invariance (DIF Country)	4065.504*	2973	.927	.916	.031 [.028; .033]	2	411.281*	204	-.007	-.003	+.001
7. Partial Invariance (DIF Comorbidity)	4003.084*	2973	.931	.921	.030 [.027; .032]	2	333.677*	204	-.003	+.008	.000
8. Partial Invariance (Final)	4095.696*	3036	.929	.920	.030 [.027; .032]	2	474.214*	267	-.005	+.001	.000
Longitudinal Measurement Invariance											
1. Configural	12415.129*	11280	.931	.926	.016 [.014; .018]	—	—	—	—	—	—
2. Weak	12509.315*	11374	.931	.927	.016 [.014; .018]	1	133.606*	94	.000	+.001	.000
3. Strong	12694.294*	11565	.932	.928	.016 [.014; .018]	2	208.936	191	+.001	+.001	.000
4. Strict	12771.769*	11643	.932	.929	.016 [.014; .018]	3	124.157*	78	.000	+.001	.000
5. Variance-covariance	12786.824*	11694	.934	.932	.015 [.013; .017]	4	69.959	51	+.002	+.003	-.001
6. Latent means	1281.395*	11704	.933	.931	.015 [.013; .017]	5	3.213*	10	-.001	-.001	.000

Note. *$p < .01$; ID: Intellectual disability; DIF: Differential item functioning; χ^2: WLSMV chi-square; df: Degrees of freedom; CFI: Comparative fit index; TLI: Tucker-Lewis index; RMSEA: Root mean square error of approximation; 90% CI: RMSEA 90% confidence interval; CM: Comparison model; Δ: Change in model fit relative to the comparison model.

Appendix E
Detailed Discussion of the Results from the Tests of Convergent Validity

Student-Teacher Relationship. Youth's reports of STR warmth correlated positively with their reports of prosocial behaviors and negatively with their reports of physical aggressiveness and parental reports of depression (GDSID). No correlation was observed between youth's reports of STR warmth and teachers' reports of depression (GDSID or ADAMS), anxiety, prosocial behaviors, and physical aggressiveness, or with parental reports of anxiety, prosocial behaviors, physical aggressiveness, and depressive mood (ADAMS).

However, suggesting that youth with internalizing difficulties might feel more supported by their teachers, youth's reports of STR warmth correlated positively with their reports of anxiety and depression. Conversely, youth's reports of STR conflict were positively correlated with their reports of depression, anxiety, and physical aggressiveness, and with teachers' reports of depression (GDSID) and physical aggressiveness. In contrast, teachers' and youth's reports of STR conflict were positively correlated with parental reports of general anxiety. Moreover, teachers' reports of STR conflict were positively related to youth's reports of prosocial behaviors. No correlations were observed between youth's reports of STR conflict and their reports of prosocial behaviors, teachers' reports of anxiety and depressive mood (ADAMS), and parental reports of depression (GDSID and ADAMS), social avoidance, prosocial behaviors, and physical aggressiveness.

When teachers' reports were considered, a similar pattern of associations emerged, but revealing fewer outcome associations involving the warmth dimension than the conflict dimension. Thus, teachers' reports of STR warmth were negatively associated with youth's reports of depression as well as with teachers' and parents' reports of social avoidance, and positively associated with teachers' reports of prosocial behaviors. No associations between teachers' reports of STR warmth were found in relation to youth's reports of anxiety, prosocial behaviors, or physical aggressiveness, teachers' and parents' reports of depression (GDSID and ADAMS), general anxiety, and physical aggressiveness, and parents' reports of prosocial behaviors. In contrast, teachers' reports of STR conflict were negatively associated with parents' and teachers' reports of prosocial behaviors, and with parents' reports of general anxiety. These reports were also positively associated with youth's self-reports of depression, anxiety, physical aggressiveness, and prosocial behaviors, with teachers' reports of depression (GDSID and ADAMS), general anxiety, social avoidance, and physical aggressiveness, and with parents' reports of physical aggressiveness. No associations were found between teachers' reports of conflict and parental reports of depression (GDSID and ADAMS).

Parent-Child Relationship. Youth's reports of PCR warmth were found to be positively associated with youth's and parents' reports of prosocial behaviors, but shared no associations with any of the other outcome variables. In contrast, youth's reports of PCR conflict were found to be positively associated with their own reports of depression, anxiety, and physical aggressiveness, as well as with teachers' and parents' reports of depression (GDSID), and teachers' reports of physical aggressiveness. Youth's reports of PCR conflict also shared a negative association with their parents' reports of general anxiety. No associations were found with prosocial behaviors (as reported by youth, parents, or teachers), with social avoidance or depressed mood (ADAMS) as reported by the parents or teachers, with teachers' reports of general anxiety, and with parents' reports of physical aggressiveness.

Contrasting with youth's reports, parental reports of PCR warmth shared positive associations with parents' and teachers' reports of prosocial behaviors, and negative associations with youth's and parents' reports of physical aggressiveness, and with teachers' reports of social avoidance. No association was found between parental reports of PCR warmth and anxiety or depression (GDSID and ADAMS) reported by any of the informants, youth's reports of prosocial behaviors, and parental reports of social avoidance and physical aggressiveness. Finally, parental reports of PCR conflict shared negative associations with youth's self-reports of anxiety and parental reports of prosocial behaviors, as well as positive associations with youth's reports of physical aggressiveness, and parental reports of anxiety, depression (GDSID and ADAMS), and physical aggressiveness. No association was found between parental reports of PCR conflict and any of the teacher-reported outcomes, with youth's reports of depression and prosocial behaviors, and with parents' reports of social avoidance.

Appendix F

Detailed Description of the Results from the Alternative Measurement Models Estimated at T2

As a first attempt to evaluate whether the results from the measurement models would be replicated (i.e., generalizability) at Time 2, we first estimated the same series of models (reported in Table 1) using Time 2 responses. The model fit from these models essentially replicate those obtained at Time 1 in the main manuscript. More precisely, these results show that, for both STR and PCR, the best fitting model was Model 3, which is consistent with the relatively high correlations obtained in Model 1 between caregiver reports of their own, relative to youth's, perspective on relational warmth (parents r = .665; teachers r = .766) and conflict (parents r = .927; teachers r = .980). Model 3 was thus retained for both types of relationships, and combined into a single model, which also achieved a fully satisfactory level of fit to the data. The parameter estimates from this final combined model are reported in Tables 2 (loadings and uniquenesses) and 3 (correlations) of the main manuscript.

Matching Time 1 results, these results reveal fully comparable and satisfactory, parameter estimates revealing well-defined and reliable factors reflecting: (a) youth's reports of teacher's warmth (λ = .505 to .946; ω = .871) and conflict (λ = .683 to .830; ω = .901); (b) youth's reports of parental warmth (λ = .667 to .930; ω = .918) and conflict (λ = .571 to .794; ω = .881); (c) teachers' reports of warmth (λ = .239 to .863; ω = .891) and conflict (λ = .614 to .952; ω = .963); (d) parental reports of warmth (λ = .296 to .908; ω = .891) and conflict (λ = .624 to .939; ω = .954).

The latent correlations obtained in this model are also consistent with a reasonable degree of differentiation between all factors. Supporting Time 1 results, these correlations revealed moderate negative correlations between youth's ratings of their relational warmth and conflict with each caregiver, although this correlation was lower in relation to their parents (r = -.360) than their teachers (r = -.528). These results support the idea that warmth and conflict tend to be more frequently disassociated at home than at school. Also replicating Time 1 results, teachers' ratings revealed a greater degree of differentiation between the presence of warmth and conflict in their relationships with the target youth (r = -.434), relative to parents (r = -.725). Furthermore, youth self-reports were once again consistent with a moderate degree of similarity between their report of relational warmth (r = .600) and conflict (r = .480) in their relationship with their parents and teachers. Finally, the remaining correlations were again consistent with the relative independence of ratings obtained from distinct sources in relation to distinct dimensions of relationship quality (|r| = .003 to .434).