

**Running Head.** Anxiety Trajectories

**School Experiences and Anxiety Trajectories among Youth with Intellectual Disabilities**

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## Abstract

**Purposes.** This study investigated how the school experiences and personal characteristics of youth with Intellectual Disabilities (ID) contribute to their longitudinal trajectories of anxiety. **Methods.** To this end, we relied on a sample of 390 youth with mild (48.2%) to moderate (51.8%) levels of ID, aged from 11 to 22 ( $M=15.70$ ), and recruited in Canada ( $n=140$ ) and Australia ( $n=250$ ). Across three yearly time points, all participants completed self-report measures of anxiety, school climate, and victimization. **Results.** Our results revealed a slight normative decrease in anxiety over time and showed that experiences of school victimization were associated with higher levels of anxiety (initially and momentarily) and increases in victimization were accompanied by increases in anxiety over time. Perceptions of attending a school that fosters security and promotes learning also tended to be accompanied by lower levels of anxiety (initially and momentarily). Momentary increases in perceptions of attending a school that fosters positive peer interactions were associated with momentary decreases in anxiety, whereas momentary increases in perceptions of attending a school characterized by positive teacher-student relationships and an equitable treatment of all students both led to small momentary increases in anxiety once all other components of student school experiences were considered. **Conclusion.** The theoretical and practical implications of these results are discussed.

**Keywords:** Intellectual disabilities; anxiety trajectories; school experiences; school climate; victimization; special education needs; inclusive education.

## 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.
- All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.
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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 sixth authors' institutions

### Informed Consent:

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

**Céleste Dubé:** Conceptualization, Methodology, Analyses, Writing (original draft, review, editing); **Alexandre J.S. Morin:** Funding (both countries), Study Design (both countries), Data Collection (Australia), Conceptualization, Methodology, Analyses, Writing (original draft, review, editing); **Elizabeth Olivier:** Conceptualization, Methodology, Analyses, Writing (original draft, review, editing); **William Gilbert:** Methodology, Analyses, Writing (original draft, review, editing); **Danielle Tracey:** Funding (Australia), Study Design (Australia), Data Collection (Australia), Writing (original draft, review, editing); **Rhonda G. Craven:** Funding (Australia), Study Design (Australia), Data Collection (Australia), Writing (original draft, review, editing); **Christophe Maïano:** Funding (both countries), Study Design (both countries), Data Collection (Canada), Conceptualization, Methodology, Writing (original draft, review, editing).

## 1. Introduction

Anxiety is one of the most prevalent mental health problems among young populations, with worldwide pooled prevalence estimates of anxiety disorders reaching 6.5% among children and adolescents (Polanczyk et al., 2015; Lépine, 2002), although rates closer to 30% have been reported in a large nationally representative survey of US adolescents (Merikangas et al., 2010). This last estimate is consistent with the adult lifetime prevalence rates of anxiety disorders (Bandelow & Michaelis, 2015; Baxter et al., 2013; McCall-Hosenfeld et al., 2014), suggesting that adolescence is a key developmental period for the emergence of anxiety. Indeed, adolescence is associated with a series of major biopsychosocial transitions (i.e., cognitive maturation, increases in autonomy, puberty, school transitions, new peer group, etc.) likely to represent a significant source of stress and anxiety (Eccles et al., 1993; Roeser et al., 2000; Steinberg & Morris, 2001), particularly among those less prepared to deal with these transformations (Eccles & Roeser, 2009; Vasey et al., 2014).

Youth with intellectual disabilities (ID) display a particularly high risk of developing anxiety in adolescence (Buckles et al., 2013; Einfeld et al., 2011; Maïano et al., 2018; Vasa et al., 2013). An ID is defined by the presence of significant limitations, varying in severity, in general mental abilities and adaptive functioning in one or more of three domains (i.e., conceptual, social, and practical; American Psychological Association [APA], 2022). The increased vulnerability for anxiety reported among youth with ID may result in part from their more limited cognitive skills, which can interfere with their ability to successfully negotiate the challenges of adolescence, as well as from their higher dependency on adult caregivers, which can interfere with the normative development of their autonomy (Craven et al., 2015; Wehmeyer, 2005). Both explanations highlight how important the school context is likely to be in helping these youth successfully negotiate the developmental tasks of adolescence, but also in doing it while progressively gaining autonomy from their primary caregivers (Craven et al., 2015). For this reason, it is particularly worrisome to note that youth with ID are also more likely to be exposed to negative school experiences, ranging from peer victimization to difficulties in achieving a satisfactory level of social integration (Blacher et al., 2009; Hamadi & Fletcher, 2021; Maïano et al., 2016; Tipton et al., 2013; Tipton-Fisler et al., 2018).

The present study was designed to identify which components of their school experiences are the most likely to contribute to changes in the longitudinal trajectories of anxiety of youth with ID over the course of their adolescence. In doing so, we also consider the well-established role of school victimization as a core driver of anxiety during adolescence. However, to avoid perpetuating deficit models (Halfon et al., 2012; Soresi et al., 2011), we also consider the role played by various positive – and modifiable – facets of youth’s school experiences (i.e., positive school climate) as drivers of developmental trajectories characterized by lower levels of anxiety (e.g., Morin et al., 2009, 2013).

### 1.1. Anxiety Trajectories among Youth with ID

Research has shown that anxious adolescents often display early signs of anxiety in childhood (Beesdo-Baum & Knappe, 2012; Costello et al., 2003; Roza et al., 2003). However, results related to the evolution of anxiety during adolescence and into early adulthood remain scarce and highly inconsistent (e.g., Hale et al., 2008, 2009; Morin et al., 2011; van Oort et al., 2009). This dearth of research is even more obvious when we consider youth with ID. Among the few exceptions, Green et al. (2015) relied on parental reports of their child’s anxiety between the ages of 5 and 9 and found that anxiety trajectories tended to increase among youth with mild and moderate levels of ID, as well as among typically developing (TD) youth. They also noted that, when specifically considering separation anxiety, the normative decrease typically observed among TD youth was delayed among their peers with ID, which is consistent with their higher level of dependency on adult caregivers. Similarly, considering parental reports of child’s anxiety between the ages of 3 to 13, Rodas et al. (2020) also reported increasing trajectories.

All of these results come from samples of children with ID rated by their parents. Studies focusing on adolescence are far less consistent (Botting et al., 2016; Foley et al., 2016; Gotham et al., 2015; Tonge & Einfeld, 2003). In a study of youth with autism spectrum disorders and other types of developmental delays, Gotham et al. (2015) noted an increase in parental reports of anxiety among girls ( $n = 35$ ), but not boys ( $n = 130$ ), between the age of 13 and 23. They also noted that boys and youth with autism spectrum disorders tended to display higher levels of anxiety throughout the study. However, among a larger group of youth with ID with ( $n = 323$ ), or without ( $n = 466$ ), Down syndrome, Foley et al. (2016) found that parental ratings of anxiety decreased slightly between the age of 12 to 26

in a way that was similar for boys and girls. They also noted that youth with Down syndrome tended to display higher levels of anxiety throughout the study. In contrast, Botting et al. (2016) reported that boys' and girls' trajectories of anxiety rated by their parents remained stable between the ages of 16 and 24 among a sample of 242 youth with a language impairment and 99 same age peers. However, they also noted that girls and youth with more severe language impairments tended to display higher levels of anxiety throughout the study. Lastly, in a study focused on youth with ID ( $N = 578$ ), Einfeld et al. (2006; also see Tonge & Einfeld, 2003) reported decreasing trajectories of parental ratings of anxiety between the age of 12 and 24. They also noted that this decrease was less pronounced among girls, as well as among youth with a more severe ID, who also displayed lower levels of anxiety over time.

Beyond the rarity of studies focusing specifically on youth with ID and beyond the possible influence of comorbid conditions on these trajectories, the inconsistency of results among studies covering similar developmental periods clearly highlights the need for replication. Perhaps more importantly, none of these studies considered youth's self-reports of their own anxiety. This means that, at least for research including youth with mild and/or moderate levels of ID (i.e., allowing them to provide reliable self-reports), the unique perspective of youth with ID on their own internal states has generally been ignored (Bear et al., 2002; Turk et al., 2012). Indeed, reliable and valid instruments have been developed to allow youth with mild and moderate levels of ID to express their own unique voices in this regard (Mañano et al., 2023; Mindham & Espie, 2003). Moreover, self-reports of internal states obtained from youth with ID have been shown to capture a qualitatively different and complementary perspective relative to informant reports (Dubé et al., 2022; Olivier et al., 2021). The present study thus seeks to add to our understanding of how anxiety evolves during adolescence from the unique perspective of youth with ID, while also considering whether and how this evolution is influenced by their sex, level of ID (mild or moderate), and the presence of comorbid conditions. We also uniquely consider how these trajectories are influenced by youth with ID's school experiences.

## 1.2. School Life and Anxiety in Youth with ID

School experiences are crucial to mental health development among TD youth (e.g., Eccles et al., 1993). This role is likely to be even greater for youth with ID given their higher dependency on adult caregivers (such as teachers) and the fact that schools often are a main area of socialization (Craven et al., 2015). Schools are complex social systems where multiple factors, including personal experiences and school climate perceptions (Morin et al., 2009, 2013), come together to foster, or impede, healthy development. All youth spend a significant part of their life at school, where they may encounter stress-generating (e.g., conflict, failure, rejection) and self-enhancing (e.g., support, success, security) experiences likely to respectively increase or decrease their risk of anxiety.

Stage-environment fit theory (Eccles & Roeser, 2009; Eccles et al., 1993) and Self-Determination Theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017) propose that psychosocial functioning depends on the fit between the characteristics of the school environment and youth's developmental needs for relatedness (i.e., the need to belong), autonomy (i.e., the need to feel a sense of volition), competence (i.e., the need to feel able to act upon one's environment), and safety (i.e., the need to feel safe)<sup>1</sup>. From these theoretical perspectives, Morin et al. (2013) proposed a three-component (i.e., interpersonal, organizational, and instructional) classification of youth's school experiences (for a similar empirically-driven classification, see Aldridge & McChesney, 2018). The *interpersonal component* focuses on the role played by school experiences for the fulfillment of youth's needs for relatedness and belongingness. The *organizational component* focuses on the role played by schools in supporting youth's needs for autonomy and safety in a balanced manner, which also entails youth's perceptions of justice, equity, and fairness. Finally, the *instructional component* focuses on the role played by schools in nurturing youth's needs for competence and achievement.

**1.2.1. Interpersonal.** Following from attachment theory (e.g., Bowlby, 1973), stage-environment fit theory proposes that development will be intimately influenced by youth's positive social interactions with significant others (e.g., Aldridge & McChesney, 2018; Roeser et al., 2000). By

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<sup>1</sup> Although SDT assumes that the first three needs (autonomy, relatedness, and competence) are sufficient to understand growth and well-being, a long tradition of educational research anchored in stage-environment fit theory has highlighted the critical importance of the need for safety as an additional driver of development among school-age youth (Aldridge & McChesney, 2018), particularly for anxiety (e.g., Morin et al., 2011).

exposing youth to positive social regard, these positive interactions will in turn contribute to generate feelings of belongingness upon which they will be able to anchor their social functioning (Morin et al., 2013). Attachment theory (e.g., Bowlby, 1973) has long emphasized the importance of early social interactions for anxiety development. Poor early interactions between children and their caregivers are expected to translate into distorted working models or cognitive representations of themselves and others that generalize over time and across contexts (Ainsworth, 1989; Bowlby, 1973). Thus, as they grow older, youth come to interpret new social experiences, such as their school-based social interactions (Rohner, 2004; Weaver et al., 2015), in ways that are consistent with these distorted representations. These representations could include the perception of hostility or rejection from others where none was intended, but also positive perceptions of social interactions. However, youth's internal working models remain subject to reconstruction across contexts (Bowlby, 1973). Importantly, social interactions occurring in the school context and involving teachers and peers are likely to represent a main occasion for youth to develop relational working models distinct from those they developed with their parents (Eccles & Roeser, 2009). As noted above, this possible impact of school experiences is likely to be even greater among youth with ID, for whom schools are often the main location for the emergence of social relations outside of the family (Craven et al., 2015). In the present study, following from Morin et al. (2013), this component is operationalized by youth's perceptions of their school relational (the quality of the relations occurring between students and between teachers and students) and bonding (youth's feelings of school belongingness) climate.

Unfortunately, although the benefits of this interpersonal component for the development of TD youth are generally well-established (Aldridge & McChesney, 2018), very little research has sought to understand how perceptions of the school relational (between-student and teacher-student) and bonding climate were related to anxiety development among youth with ID. There is, however, some empirical support showing that positive teacher-student relations may help protect youth with ID exposed to victimization against the emergence of internalizing symptoms (Olivier et al., 2020; Wright, 2017). Likewise, there is evidence that exposure to a poor peer-related relational climate was related to higher levels of anxiety among youth with ID (Klein et al., 2018). Unfortunately, no study has yet looked at how perceptions of the school bonding climate, or feelings of school belongingness, were related to anxiety among samples of youth with ID, although a negative association has been established among TD youth (e.g., Goldstein et al., 2015; Shochet et al., 2006). Thus, despite a relative dearth of research, emerging evidence tentatively suggests that poorer perceptions of teacher-student relational climate, between-students relational climate, and school bonding should be associated with higher levels of anxiety among youth with ID.

**1.2.2. Organizational.** As for the interpersonal component, the organizational component also emphasizes the importance of having a secure base (school vs. parents) from which to feel free to explore and learn (Bowlby, 1973; Ainsworth, 1989). In their focus on nurturing youth's needs for autonomy and safety, schools need to be careful in maintaining a balance between these two very distinct needs. Schools that encourage, value, and protect the expression of students' autonomy are likely to help them learn how to express themselves in a prosocial manner, which is a key driver of successful development (Hoge et al., 1990; Roeser et al., 2000; Way et al., 2007). However, for this to happen, youth need to feel free to express themselves without fearing for their safety and learn to do so in a manner that does not interfere with the ability of other students to express their own autonomy (Aldridge & McChesney, 2018; Eccles & Roeser, 2009; Wigfield et al., 2006). An optimal school organization thus needs to balance autonomy with safety and order. Youth's perceptions of being treated fairly at school (i.e., fairness climate) form a key indicator that this balance has been attained (e.g., Morin et al., 2009, 2013). Research conducted among TD populations has generally supported the idea that exposure to a school environment perceived as safe and fair helps reduce youth's risks of developing anxiety and other internalizing disorders (Aldridge & McChesney, 2018; Holfeld & Baitz, 2020; Morin et al., 2009; Way et al., 2007). The present study seeks to verify, longitudinally, the extent to which these results would generalize to youth with ID.

No examination of the associations between the organizational component of youth's school experiences and their risk of developing anxiety would be complete without the consideration of youth's direct exposure to peer victimization, which represents a direct threat to their sense of school safety and a core determinant of anxiety among young populations (e.g., Morin et al., 2011, 2013). The high rates of victimization reported among youth with ID further reinforce the importance of this consideration

among this population (Maïano et al., 2016). Peer victimization refers to one's direct exposure to verbal (i.e., being insulted or threatened), physical (i.e., being hit, pushed, or kicked), and relational (i.e., being isolated, excluded, or the object of rumors) forms of aggression perpetrated by peers (e.g., Hunter et al., 2004; Olivier et al., 2020, 2021). Research conducted among youth with ID supports the key role played by victimization in the development of anxiety and other internalizing disorders (e.g., Chiu et al., 2017; Doyle & Sullivan, 2017; Olivier et al., 2020; Reiter & Lapidot-Lefler, 2007; Ung et al., 2016; Whitney et al., 2019; Wright, 2017), thus reinforcing the need to consider this variable as a core component of the organizational component of their school experiences. Indeed, no study has yet considered the unique role of the other facets of youth's school experiences while also accounting for the role played by victimization.

**1.2.3. Instructional.** The instructional component specifically focuses on schools' educational climate (i.e., youth's perceptions of whether learning, mastery, and competence are valued in the school) and students' achievement as key determinants of youth's need for competence (Morin et al., 2013), which are also involved in the development of anxiety (e.g., Costello et al., 2005; Woodward & Fergusson, 2001). Essentially, youth who feel that their school supports learning rather than competition, values their education, and allows them to learn and achieve should feel better equipped to face the academic requirements of their schools without developing anxiety about their ability to succeed (Aldridge & McChesney, 2018; Morin et al., 2013). Not surprisingly, this instructional component of youth's school experiences has been found to protect TD youth against the development of anxiety and other internalizing disorders (e.g., Aldridge & McChesney, 2018; Morin et al., 2009). Given their more limited cognitive skills, lower levels of academic achievement, leading to a fear of failing, are more common among youth with ID than among their TD peers (Datta et al., 2013), making this component of their school experience particularly important to consider in relation to anxiety development (Sainio et al., 2019; Swanson & Howell, 1996).

**1.2.4. The Need for a Comprehensive Investigation.** While youth with and without ID should be more likely to experience anxiety when their school experiences are unable to properly support their developmental needs, the relative importance allocated to these three different components may differ between these two populations (e.g., Forte et al., 2011; Young et al., 2016; Young-Southward et al., 2017). For instance, whereas TD youth may be more concerned about becoming independent from their parents, making money, and embarking on a successful career trajectory as they transition into adulthood, youth with ID may be more concerned about maintaining positive relations with their primary caregivers and peers, avoiding peer victimization, and achieving a level of academic achievement sufficient to allow them to obtain paid employment (e.g., Forte et al., 2011; Young et al., 2016; Young-Southward et al., 2017). As a result, considering any of these possible characteristics of youth with ID's school experiences in isolation is not likely to allow us to achieve a complete understanding of the core drivers of anxiety among this unique population.

### **1.3. The Present Study**

This study seeks to identify the shape of the anxiety trajectories observed among a sample of youth with ID followed over time for three years, while also considering whether and how these trajectories differ as a function of their sex, ID level, and the presence of comorbid conditions. Given the conflicting results obtained from previous studies conducted among samples of youth with ID, we leave these objectives as open research questions. In addition, we also consider the dynamic role of a series of interpersonal (i.e., between-students relational climate, teacher-student relational climate, bonding climate), organizational (i.e., safety climate, fairness climate, and peer victimization), and instructional (i.e., educational climate and achievement) components of youth's school experiences in the prediction of the shape of their anxiety trajectories. Based on the bulk of previous research conducted among samples of youth with and without ID, and from the theoretical perspectives of SDT (e.g., Ryan & Deci, 2017) and stage-environment fit theory (e.g., Eccles et al., 1993), we expect all three components to play a role in the prediction of youth's trajectories of anxiety. More specifically, negative perceptions of the school climate (relational, bonding, safety, fairness, and educational), lower levels of academic achievement, and higher levels of peer victimization should be associated with higher initial levels of anxiety, with more pronounced increases over times in these levels, and with time-specific increases in youth's levels of anxiety. However, given the lack of previous studies providing a comprehensive picture of the complementary role played by these school experience components for the development of anxiety among youth with ID, we leave the relative contribution of these factors as an open research

question, although we expect peer victimization to emerge as a core driver of anxiety among this population (Maïano et al., 2016; Olivier et al., 2020).

## 2. Method

### 2.1. Participants

This study relies on a sample of 390 youth with mild (48.2%) to moderate (51.8%) levels of ID. These students were recruited from secondary schools located in Canada (French-speaking,  $n=140$ , 49.30% males) and Australia (English-speaking,  $n=250$ , 67.10% males). Participants' age ranged from 11–22 years old ( $M=15.70$ ,  $SD=2.17$ ). Using the text revised version of the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000), the official ID classification system at the time of data collection, those with a global IQ between 35 and 49 were classified as having a moderate ID, while those with a global IQ between 50 and 70 were classified as having a mild ID. In Canada, most youth attended regular schools but were enrolled in special classrooms (69.30%), while some attended special schools (30.70%). In Australia, all youth were recruited from regular schools and of those, 92.6% were enrolled in special classrooms. All participants who participated in the initial data collection point (Time 1;  $N = 390$ ) we recontacted after one (Time 2) and two (Time 3) years to complete the same questionnaires following the same procedures: 270 of them (84 in Canada and 186 in Australia; 61.90% males; 45.30% mild ID; 54.70% moderate ID) participated at Time 2, and 229 of them (76 in Canada and 153 in Australia; 62% males; 43.30% mild ID; 56.70% moderate ID) participated at Time 3.

### 2.2. Procedure

Recruitment was facilitated by schools and community organizations. In Australia, no compensation was offered for participation, whereas Canadian participants were offered (each year) a chance to win one out of 40 gift certificates (\$30 CAD) as an incentive for their participation. Parents actively provided signed informed consent for the participation of their child, allowing us to request teacher participation, and granting us access to school records. For youth recruited at school ( $N = 130$  in Canada and all 250 participants in Australia), this consent form (with an accompanying information letter) was sent to the parents (or legal representatives) by the school. For the few youth recruited outside of school ( $N = 12$  in Canada and none in Australia), these materials were directly given to the parents by the research team and returned using a reply-paid envelope. All youth were also asked to consent to their own participation actively and voluntarily. As part of these procedures, all youth were informed about the goals and procedures of the study, about their right not to participate or withdraw from the study at any time without consequence, and about the confidentiality of their responses.

Parental consent procedures granted the researchers access to school records for all participants. These records included information about youth's most recent assessment of intellectual functioning (only youth with an official school-based ID classification were recruited). The Wechsler (2003) Intelligence Scale for Children – Fourth Edition (WISC-IV) was the IQ test most frequently used by the schools in both countries. However, when the most current IQ score was obtained more than 4 years prior to the study, new IQ assessments were conducted by registered psychologists using the WISC-IV, the Wechsler Adult Intelligence Scale-IV (Wechsler et al., 2008), or the Leiter international performance scale-revised (Roid & Miller, 1997), depending on age and verbal ability. In Australia, 34 participants were thus re-assessed, all of them using the Wechsler version matching their chronological age (31 WISC-IV and 3 WAIS-IV). In Canada, 77 participants were thus assessed, 63 of them using the Wechsler version corresponding to their chronological age (29 WISC-IV and 34 WAIS-IV), and 14 (with lower verbal expression skills) using the Leiter. This breakdown (in terms of IQ tests) is not available for participants for whom we obtained IQ scores from the school records.

Participants were met at their school (or at a time and location most convenient for them for those recruited outside of schools) by trained research assistants who explained the goals and procedures of the study. Using sample questions for each section of the questionnaire (involving graphical displays and pictograms), the assistants explained the response scales. For participants with mild levels of ID, testing was conducted in small groups of up to 8 participants (or individually for youth recruited outside of schools). For participants with moderate levels of ID, testing was done with 1 or 2 participants at a time. The physical separation between participants was maximised, and a read-aloud procedure was used to increase understanding. Participants were encouraged to ask questions and asked to circle their responses on a paper questionnaire. When answering questions, the research assistants only focused on youth's understanding of the items and response scales rather than on the content of their individual

responses. Despite this help, some participants occasionally remained unable to understand a question and were instructed to select the “do not understand” option. Those responses (Time 1: 3.59% to 7.95%;  $M=4.59\%$ , Time 2: 1.84% to 5.88%;  $M=2.54\%$ , Time 3: 0.79% to 4.37%;  $M=1.49\%$ ) were treated as missing values. During data collection, research assistants always had access (via phone or in person) to one member of the research team. Teachers were encouraged to complete their own questionnaires during data collection, allowing members of the research team to directly recover their questionnaires. They could also complete the questionnaires at a time more convenient for them and return their responses using a reply-paid envelope.

### 2.3. Measures

To facilitate understanding, all instruments relied on a graphically-anchored response scale, and incorporated pictograms to describe the words used in all items. All self-report questionnaires were first trialed in two pilot studies involving, respectively, 18 (13–21 years old;  $n=8$  in Canada and  $n=10$  in Australia) and 16 ( $n=6$  in Canada and  $n=10$  in Australia) youth with ID to ensure their suitability.

**2.3.1. Global Anxiety.** At each time point, students self-reported their symptoms of anxiety using the Glasgow Anxiety Scale for People with Intellectual Disabilities (GAS-ID; Mindham & Espie, 2003) adapted specifically for self-report among youth with ID (Maïano et al., 2023). This measure includes 27 items covering worries (10 items;  $\alpha_{T1}=.855$ ,  $\alpha_{T2}=.852$ ,  $\alpha_{T3}=.877$ ; e.g., “I worry a lot”), fears (9 items;  $\alpha_{T1}=.837$ ,  $\alpha_{T2}=.780$ ,  $\alpha_{T3}=.833$ ; e.g., “I am scared of the dark”), and physiological symptoms (8 items;  $\alpha_{T1}=.867$ ,  $\alpha_{T2}=.864$ ,  $\alpha_{T3}=.849$ ; e.g., “When I am nervous or uncomfortable, I have difficulty breathing), and can be used to obtain a global anxiety score ( $\alpha_{T1}=.927$ ,  $\alpha_{T2}=.911$ ,  $\alpha_{T3}=.924$ ). These items were rated on a 5-point response scale ranging from “*Never*” to “*Always*.”

**2.3.2. School Climate (Predictor).** Youth’s school climate perceptions were measured using six subscales from the Socio-Educative Environment Questionnaire (Janosz et al., 2007), adapted for this study for self-report among youth with ID following well-established procedures (e.g., Dubé et al., 2022; Maïano et al., 2023; Olivier et al. 2021, 2022). These subscales covered: (a) Between-students relational climate (5 items; e.g., “Students have fun together”;  $\alpha_{T1}=.878$ ,  $\alpha_{T2}=.882$ ,  $\alpha_{T3}=.899$ ), (b) teacher–student relational climate (6 items; e.g., “Students feel close to their teacher”;  $\alpha_{T1}=.895$ ,  $\alpha_{T2}=.923$ ,  $\alpha_{T3}=.933$ ), (c) safety climate (4 reversed scored items; e.g., “Many students are afraid of other students”;  $\alpha_{T1}=.778$ ,  $\alpha_{T2}=.720$ ,  $\alpha_{T3}=.781$ ), (d) fairness climate (6 items; e.g., “Students are treated fairly regardless of whether students are boys or girls”;  $\alpha_{T1}=.814$ ,  $\alpha_{T2}=.815$ ,  $\alpha_{T3}=.831$ ), (e) educational climate (7 items; e.g., “Students learn important things”;  $\alpha_{T1}=.879$ ,  $\alpha_{T2}=.894$ ,  $\alpha_{T3}=.907$ ), and (f) bonding climate (4 items; e.g., “I like my school”;  $\alpha_{T1}=.864$ ,  $\alpha_{T2}=.849$ ,  $\alpha_{T3}=.856$ ). Youth rated each of these statements on a 5-point scale ranging from “*totally disagree*” to “*totally agree*”.

**2.3.3. Victimization (Predictor).** Youth self-reported their experiences of victimization during the current school year (for each year of the study) using the relevant items from the Socio-Educative Environment Questionnaire (Janosz et al., 2007), as adapted for self-report among youth with ID by Olivier et al. (2020, 2021). These items encompass verbal (e.g., “Another student was rude or laughed at me”), physical (e.g., “Another student pushed, hit or kicked me”) and relational (e.g., “Another student didn’t want me to play with their friends”) victimization, and are designed to obtain a single victimization score ( $\alpha_{T1}=.945$ ,  $\alpha_{T2}=.912$ ,  $\alpha_{T3}=.945$ ). All 17 items were rated on a 6-point response scale ranging from “*Never*” to “*5 times or more*”.

**2.3.4. Academic Achievement (Predictor).** Homeroom teachers were asked to report their students’ level of academic achievement in reading, writing, math, and science, as well as their overall level of academic achievement using a 5-point response scale ranging from “*Among the lowest in his/her class*” to “*Near the top of his/her class*”. These five indicators of achievement were used to obtain a single global achievement score for each student ( $\alpha_{T1}=.907$ ,  $\alpha_{T2}=.871$ ,  $\alpha_{T3}=.903$ ).

**2.3.3. Covariates.** Youth’s sex (0=girl; 1=boy), age, and ID level (0=mild; 1=moderate) were obtained via official school records. Among participants, 109 (28.4%) had a reported comorbidity (coded 0=none; 1=yes; 55 had a comorbid autism spectrum disorder, 48 a comorbid genetic syndrome, and 6 had both).

## 3. Analyses

### 3.1. Summary of the Analytic Strategy

After estimating a series of preliminary measurement models to verify the psychometric properties of our measures, and to extract factor scores (providing a correction for unreliability) for our main analyses, we relied on latent curve models to test our main hypotheses. Latent curve models summarize



the evolution of repeated measures through three different components, which all differ from one participant to another: (a) an intercept, which represent initial levels (at the beginning of the study); (b) a slope, which summarize the trait-like evolution of the repeated measures over time (reflecting how much increase or decrease happens in a year); (c) time-specific residuals, which represent momentary fluctuations around one's main trajectory occurring at a specific point in time. We first tested whether youth's personal characteristics had an impact on their initial levels (intercept) and changes (slope) in anxiety over time. We then tested whether initial levels (intercepts) on the predictors had an impact on youth' initial levels (intercept) and changes (slope) in anxiety, before testing whether changes (slope) in the predictors also influenced changes (slope) in anxiety. Lastly, we tested whether momentary changes in the predictors also predicted momentary changes in anxiety. A more technical description of all analytical steps follows.

### 3.2. Preliminary Analyses

A variety of factor analytic models were first estimated to assess the measurement properties of our instruments and to extract factor scores for the main analyses. These analyses relied on the robust weighted least squares estimator with mean and variance adjusted statistics (WLSMV) available in Mplus 8.7 (Muthén & Muthén, 2021). Relative to maximum likelihood-based estimators, WLSMV provides a closer representation of participants' response process for ordinal items including five or fewer response categories and/or following asymmetric response thresholds, such as the items used in this study (Finney & DiStefano, 2013; Li, 2016). Missing data at the item level was low at each time point (self-reports: 1.36% to 12.95%,  $M=6.11\%$ ; teacher reports: 0% to 8.97%,  $M=3.04\%$ ) and was handled using the default algorithms for missing data implemented with WLSMV, which allowed us to use all available information from all participants (Asparouhov & Muthen, 2010; Enders, 2010). Importantly, although we estimated these models using the whole sample, time-specific factors scores were only saved for participants who completed each specific measurement point, as missing data procedures implemented within our main analyses are more efficient than those implemented with WLSMV to handle attrition (Asparouhov & Muthen, 2010; Enders, 2010).

Given the complexity of the longitudinal measurement models estimated in this study, four sets of models were separately estimated. First, following Maïano et al. (2023) recommendations, students' ratings on the GAS-ID were modeled using a bifactor exploratory structural equation modeling (bifactor-ESEM) representation. This representation makes it possible to obtain a reliable and valid estimate of youth's global levels of anxiety while properly accounting for the multidimensionality (i.e., the conceptually-related subscales) of the GAS-ID. These models were estimated using a confirmatory bifactor-target rotation procedure (Asparouhov & Muthén, 2009; Browne, 2001), allowing us to estimate one global (global anxiety) and three orthogonal specific factors (worries, fears, and physiological symptoms) explicitly defined by their *a priori* indicators while targeting all cross-loadings among the specific factors to be as close to zero as possible (Morin et al., 2016, 2020). Second, to account for their conceptually-related nature, youth's reports of between-students relational climate, teacher-student relational climate, fairness climate, educational climate, and bonding climate were modeled using an *a priori* ESEM representation, using target rotation to allow for the free estimation of cross-loadings targeted to be as close to zero as possible. Statistical research has recently shown that, when relying on conceptually-related measures, ESEM (and bifactor-ESEM) results in a more accurate representation of the latent factors, of their correlations, and of their relations with other variables (e.g., Asparouhov et al., 2015; Mai et al., 2018).

Due to the complexity of these analyses, it was not possible to include all six facets of the school climate in a single model (which would have resulted in a total of 18 factors when considering the three time points). We thus analysed youth's perceptions of the school safety climate in a separate measurement model, together with their self-reports of victimization, representing two inter-related components of their exposure to school violence. This decision was supported by preliminary analyses revealing that safety climate perceptions were mainly independent from other school climate perceptions (i.e., low correlations and no cross-loadings). These two variables (i.e., safety climate and victimization) thus form the third set of measurement models estimated in this study and were both captured by confirmatory factor analyses. In the model including all other climate dimensions, two *a priori* correlated uniquenesses were included to reflect the parallel wording of two items from the bonding climate subscale (i.e., *I am happy to ... (a) go to my school; (b) return to my school after a holiday*), and two items from the educational climate scale (i.e., *The teacher helps the students to ... (a)*

*succeed*; (b) *understand*) (Morin et al., 2016; 2020). Lastly, teachers' reports of academic achievement were modeled using a one-factor CFA at each time point, including *a priori* correlated uniquenesses between writing and reading to acknowledge the fact that these are two components of verbal achievement. All longitudinal models included *a priori* correlated uniquenesses between matching indicators over time to avoid converging on inflated estimates of stability (Marsh, 2007).

To ensure that all measures performed equivalently and that factor scores were comparable over time, we tested the measurement invariance of each model over time in sequence (Millsap, 2011; Morin, et al., 2011): (a) configural (i.e., same factor structure); (b) weak (i.e., invariance of factor loadings); (c) strong (i.e., invariance of factor loadings and response thresholds); (d) strict (i.e., the invariance of factor loadings, response thresholds, and item uniquenesses); (e) correlated uniquenesses (for the reading-writing correlated uniqueness included in the teachers model); (f) latent variance-covariance; and (g) latent means.

Given the known oversensitivity of the chi-square ( $\chi^2$ ) test of exact fit to sample size and minor misspecification, we relied on common goodness-of-fit indices to assess model fit (Hu & Bentler, 1999; Marsh et al., 2005). Values greater than .90 and .95 on the comparative fit index (CFI) and on the Tucker-Lewis index (TLI), as well as values lower than .08 and .06 on the root mean square error of approximation (RMSEA), were respectively taken to reflect adequate and excellent fit. We also report the model-based composite reliability of all factors (McDonald, 1970). For model comparisons (e.g., tests of measurement invariance) we considered decreases in CFI and TLI greater than .01, and increases in RMSEA greater than .015, relative to the previous model in the sequence to suggest a lack of invariance (Chen, 2007; Cheung & Rensvold, 2002; Marsh et al., 2005). Factors scores were saved from the most invariant model, up to the model of latent variance-covariance invariance (to avoid placing any constraints on the latent mean for the estimation of the main models), for the main analyses. These factor scores were saved in standardized units, using a *SD* of 1 at each time point, and a grand mean of 0 across all time points (so that each time-specific score can be interpreted in *SD* units as deviations from this grand mean).

### 3.3. Main Analyses

Our main analyses were conducted using the maximum likelihood robust (MLR) estimator, Mplus 8.7 (Muthén & Muthén, 2021), and Full Information Maximum Likelihood (FIML) procedures to handle attrition (Enders, 2010). The anxiety trajectories were estimated using latent curve models (LCM; Bollen & Curran, 2006) based on youth's time-specific global levels of anxiety. LCM relies on the estimation of intercepts (reflecting youth's initial levels of anxiety) and linear slopes (reflecting the rate of change in youth's levels of anxiety over time) to reflect growth trajectories (e.g., Bollen & Curran, 2006; Diallo et al., 2014). In these analyses, time was coded in unit increments (0–2) to reflect the one-year intervals between the three repeated measures<sup>2</sup>. In LCM, these intercept and linear slope factors are specified as random variables with a mean (reflecting the average trajectories observed in the whole sample) and a variance (reflecting the fact that these trajectories vary across participants). This random specification makes it possible to incorporate predictors of growth.

To assess the role of sex (0=girl; 1=boy), age (in standardized units), ID level (0=mild; 1=moderate), and comorbid conditions (0=no; 1=yes), we contrasted three alternative predictive models. Model 1 is a null model, in which associations between these variables and the intercept (i.e., initial level) and slope (rate of change over time) of the anxiety trajectories were fixed to be zero. Model 2 allowed these variables to predict the intercept, but not the slope, of the anxiety trajectories. Finally, Model 3 allowed these variables to predict the intercept and slope of the anxiety trajectories.

For our theoretical predictors, which were measured repeatedly over the course of the study, we followed a procedure first advocated by Morin et al. (2011) to test associations among longitudinal trajectories without unreasonably increasing the computational complexity of the models. More

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<sup>2</sup> To ensure that there was no evidence of nonlinearity, we also estimated latent basis models (relying on freely estimated time codes to avoid imposing a linear function). These models revealed no evidence of nonlinearity. Following Metha and West's (2000) recommendations, we also tested whether relying on uniform time codes when participants differ in age could result in estimation biases. As we found no evidence (condition 1) that the regression of the intercept factor on age was equal to the slope factor, and (condition 2) that the regression of the slope factor on age was equal to zero, we concluded that no bias occurred as a result of this decision. However, to fully account for possible age differences, we included it as an additional predictor in our analyses.

precisely, we relied on a series of preliminary LCM to estimate the shape of youth's trajectories on all these predictors. Factors scores, reflecting youth initial levels (intercepts), linear growth over time (slopes) and time-specific fluctuations around their model estimated trajectories were saved from these models and used in our main analyses as predictors of youth anxiety trajectories. These factor scores were then incorporated to the main LCM solution for anxiety, and the optimal predictive model was selected among four alternative solutions. Model 1 was a null model (all predictions were fixed to 0). Model 2 allowed the associations between the intercepts of the predictor trajectories and the intercepts of the anxiety trajectories to be freely estimated. Model 3 also allowed the associations between the intercepts of the predictor trajectories and the linear slopes of the anxiety trajectories to be freely estimated (i.e., added to Model 2). Model 4 also allowed the associations between the linear slopes of the predictor trajectories and the linear slopes of the anxiety trajectories to be freely estimated (i.e., added to Model 3). Finally, we tested whether time-specific deviations around the estimated predictors' trajectories could predict time-specific deviations around the anxiety trajectories, to verify the momentary effects of the predictors on momentary fluctuations in anxiety by contrasting three alternative models. Model 1 was again a null model (all predictions were fixed to 0). Model 2 freely estimated these predictions but constrained them to have the same magnitude over time. Model 3 freely estimated these predictions and allowed them to vary over time.

## 4. Results

### 4.1. Preliminary Measurement Models

The results from all preliminary measurement models are disclosed in the online supplements. All measurement models resulted in an excellent level of fit to the data at each separate time point (see Table S1 of the online supplements) and were entirely invariant over time (see Table S2 of the online supplements). The standardized parameter estimates from the model of latent variance-covariance invariance associated with the measure of anxiety (from which the factor scores were extracted) are reported in Table S3 of the online supplements and reveal a well-defined and reliable global anxiety factor ( $M_\lambda = .591$ ;  $\omega = .954$ )<sup>3</sup>. The standardized parameter estimates from the model of latent variance-covariance invariance associated with the measurement model underlying our predictors (from which the factor scores were extracted) are reported in Table S4 to S6 of the online supplements. These results reveal that all factors were well-defined ( $M_\lambda = .756$ ) and reliable ( $\omega = .823$  to  $.970$ ). Lastly, the parameter estimates from the preliminary LCM models used to represent the predictors' trajectories (and to save factors scores representing the intercepts, slopes, and time-specific fluctuations of the predictors' trajectories) are reported in Table S7 of the online supplements. These results reveal, on average, stable trajectories for achievement, youth's perceptions of the between-students and teacher-student relational climates, and stable youth's perceptions of the school fairness and educational climates. For these trajectories, significant inter-individual variability was observed for the intercept and slope factors (achievement and educational climates), or for the intercept factor (fairness, between-students relational, and teacher-student relational climates). These results also revealed decreasing trajectories of victimization (with significant intercept variability) and perceptions of the school bonding climate (with significant intercept and slope variability), and increasing trajectories for youth's perceptions of the school safety climate (with significant intercept variability). Correlations among all variables are reported in Table S8 of the online supplements<sup>4</sup>.

### 4.2. Latent Curve Models

**4.2.1. Unconditional LCM.** The linear LCM model used to represent youth's trajectories of global anxiety resulted in a satisfactory fit to the data ( $\chi^2 = 3.454$ ,  $df = 1$ ,  $p > .05$ ; CFI = .987, TLI = .961, RMSEA = .082 [90% CI .000, .184]). This model revealed initial levels of anxiety .145 SD units above the grand mean of the sample across all time points, accompanied by a slight but significant decreasing trajectory corresponding to a small average decrease in anxiety levels of -.098 SD units per time point. This average trajectory of anxiety is illustrated in Figure 1. Although these initial levels

<sup>3</sup> The specific factors (which are not included in our main analyses), were also reasonably well-defined, albeit weaker than the global factor: (a) Worries:  $M_\lambda = .373$ ,  $\omega = .747$ ; (b) fears:  $M_\lambda = .255$ ,  $\omega = 0.568$ ; and (c) physiological symptoms:  $M_\lambda = .340$ ,  $\omega = .680$ ).

<sup>4</sup> As an additional verification, we tested the invariance of our measures across countries. These results are reported in Table S9 of the online supplements. Despite some latent variance and mean differences, these results supported the equivalence (configural, weak, strong, and strict invariance) of our measures across countries.

presented significant inter-individual variability (variance = .541), the small rate of unconditional (i.e., when predictors are excluded from the models) decrease seemed to be normative (i.e., shared across participants as shown by a non-statistically significant slope variance of .045), and independent from their initial levels (i.e., non-statistically significant intercept-slope correlation of -.131). Fluctuations occurred around these average trajectories (time-specific residuals = .183 to .317 across time points).

**4.2.2. Individual Characteristics and Anxiety Trajectories.** The results from the predictive models involving youth's individual characteristics (sex, age, ID level and comorbidities) are reported in the top section of Table 1. Although all models resulted in a satisfactory level of fit to the data, Model 2 resulted in a substantial improvement in model fit relative to Model 1 ( $\Delta\text{CFI}$  and  $\Delta\text{TLI} > .01$ ;  $\Delta\text{RMSEA} > .015$ ), whereas Model 3 resulted in a decrease in fit relative to Model 2. These results thus support the presence of effects limited to the intercept of the anxiety trajectories; a conclusion that was supported by an examination of the parameter estimates associated with all three models. Model 2 was thus retained for interpretation. These results revealed that boys reported lower initial levels of anxiety than girls ( $b = -.200$ ;  $s.e. = .088$ ;  $p \leq .05$ ;  $\beta = -.131$ ). Moreover, older students also reported lower levels of anxiety ( $b = -.104$ ;  $s.e. = .047$ ;  $p \leq .05$ ;  $\beta = -.139$ ) in a way that is consistent with our previous identification of declining trajectories of anxiety over time. In contrast, youth's ID levels ( $b = -.110$ ;  $s.e. = .093$ ;  $p > .05$ ;  $\beta = -.074$ ) and the presence of comorbid conditions ( $b = -.003$ ;  $s.e. = .112$ ;  $p > .05$ ;  $\beta = -.002$ ) had no effects on their levels of anxiety. Based on these conclusions, sex and age were retained as predictors of the intercept of the anxiety trajectories in all upcoming analyses.

**4.2.3. School Experiences and Anxiety Trajectories.** The results from the models focused on associations between youth's school experiences and anxiety trajectories are reported in the second section of Table 1. For predictions involving the intercepts and slopes of the predictors and youth's anxiety trajectories, although model fit linearly increased from Model 1, to Model 2, and to Model 3, thus supporting the added-value of Model 2 and 3 relative to the null model, neither of these models achieved a minimally acceptable level of fit according to the TLI. In contrast, Model 4 resulted in an excellent level of fit to the data, and in a significant increase in fit relative to Models 1 to 3 ( $\Delta\text{CFI}$  and  $\Delta\text{TLI} > .01$ ;  $\Delta\text{RMSEA} > .015$ ), suggesting statistically significant associations between the intercepts and slopes of the predictors' trajectories and the intercepts and slopes of the anxiety trajectories. The results from the retained Model 4 are reported in Table 2. These results indicate that initial levels of victimization were positively related to youth's initial levels of anxiety. Moreover, increases over time in youth's experiences of victimization were also significantly related to increases over time in their levels of anxiety. Second, youth's initial perceptions of the safety climate of their schools were negatively related to their initial levels of anxiety. Third, youth's initial perceptions of the educational climate of their schools were negatively related to their initial levels of anxiety, but positively related to increases over time in their levels of anxiety. When considered in the context of the small normative decline observed in the sample, this result indicates that higher perceptions of educational climate stunted the rate at which anxiety normatively decreased over time.

**4.2.4. Momentary Associations between Time-Specific Fluctuations on the Theoretical Predictors and Youth's Levels of Anxiety.** The results from the models designed to assess the momentary, or time-specific, associations between fluctuations in predictors and fluctuations in anxiety are reported in the last section of Table 1. Once again, the null model (Model 1) failed to achieve an acceptable level of fit to the data, whereas Model 2 and 3 both achieved an excellent level of fit to the data. However, although the model allowing for these effects to vary freely over time (Model 3) resulted in a higher level of fit to the data relative to the model in which these predictions were constrained to equality over time (Model 2), the parameter estimates did not reveal any apparent change in the strength of these predictions over time. This interpretation is consistent with the fact that a robust (Satorra & Bentler, 2001) chi-square difference test calculated between these two models was non-statistically significant ( $\Delta\chi^2 = 24.079$ ,  $df = 16$ ;  $p > .05$ ) which is noteworthy considering the known oversensitivity of this test to minor misspecifications (e.g., Marsh et al., 2005). The more parsimonious Model 2 (equal over time) was thus retained. The results from this model are reported in Table 3 and reveal that momentary increases in victimization were positively associated with momentary increases in youth's levels of anxiety. In addition, momentary increases in between-student relational climate and educational climate were related to momentary decreases in youth's levels of anxiety. Unexpectedly, momentary increases in school fairness climate and student-teacher relational climate perceptions were related to momentary increases in youth's levels of anxiety.

## 5. Discussion

This study sought to fill a gap in our understanding of anxiety development among youth with mild and moderate levels of ID, as well as to document the role of school experiences in this development. Our reliance on measures specifically developed to allow youth with mild and moderate levels of ID to report their symptoms of anxiety and school experiences in a psychometrically sound manner made it possible to consider these questions from youth's own unique perspectives, something that has only rarely been done in relation to anxiety development. Our results revealed a slight normative decrease in youth's anxiety trajectories over time and showed that boys and older youth displayed lower initial levels of anxiety than girls and younger students, whereas youth's levels of ID and the presence of comorbid conditions shared no association with these trajectories. Perhaps more importantly, our results finally showed that school experiences, including peer victimization but also a variety of other components of these experiences, shared multiple associations with youth's levels of anxiety. We discuss each of these results in turn.

### 5.1. Anxiety Trajectories among Youth with ID

Considering the scarcity of prior longitudinal studies of anxiety development conducted among samples of youth with ID and of the inconsistent nature of the results obtained in these studies, it was not possible to hypothesize which shape these trajectories would follow in our sample. In retrospect, it is interesting to note that our results, showcasing the presence of a small normative decline in anxiety in adolescence, are most similar to those obtained in studies relying on reasonably large samples of youth with ID (Einfeld et al., 2006; Foley et al., 2016; Tonge & Einfeld, 2003), rather than on smaller samples of youth primarily selected for presenting other types of developmental disorders (Gotham et al., 2015) or impairments (Botting et al., 2016). This convergence of results with those obtained in studies of reasonably large samples of youth with ID rated by their parents suggests that youth with mild and moderate levels of ID share their parents' perspective regarding the presence of a normative decline in adolescence in anxiety levels. Our results also revealed substantial variability in youth's initial levels of anxiety and found that these initial levels were independent from this normative decline, suggesting that youth with mild and moderate levels ID, irrespective of their initially high or low levels of anxiety, should experience a normative decrease of anxiety in adolescence.

### 5.2 Youth's Individual Characteristics and their Trajectories of Anxiety

Boys and older participants displayed lower initial levels of anxiety than girls and younger participants but followed a generally similar evolution over time (i.e., they all experienced the same normative decrease). The effect of age is, in and of itself, not surprising as it is consistent (in size and direction) with the normative decline observed in our sample. This effect is also consistent with meta-analytic studies of individuals with autism spectrum disorders. Thus, the levels of anxiety reported in a meta-analysis of younger samples of youth with autism spectrum disorders (with a mean age close to 10 years; Van Steensel et al., 2011) were substantially lower than those reported in a second meta-analysis focusing on older samples of persons with autism spectrum disorders ( $M_{age}$  close to 31 years; Hollocks et al., 2019). These results thus clearly highlight that, as they grow up, youth with mild and moderate levels ID seem to develop more efficient ways to handle their anxiety (Austin et al., 2018).

The sex differences observed in this study are consistent with the generally well-established higher levels of anxiety typically reported among TD girls relative to TD boys in adolescence (e.g., Vasey et al., 2014). Considering this convergence of results with research conducted among TD populations, where self-reports of anxiety are far more frequent, our results suggest that the lack of consistency observed in previous research focusing on youth with ID or other types of developmental disorders might be anchored in their sole focus on parental reports. Indeed, whereas some of those studies report similarly higher levels of anxiety among girls (Botting et al., 2016; Einfeld et al., 2006), one other study of youth with autism spectrum disorders reported higher levels among boys (Gotham et al., 2015), while others failed to detect sex differences (Foley et al., 2016; Rodas et al., 2020). Similarly, the lack of observed associations between youth levels of ID and the presence of comorbid conditions is not entirely consistent with previous research evidence stemming mainly from studies focusing on youth with specific types of developmental disorders and parental reports of anxiety (Botting et al., 2016; Einfeld et al., 2006; Foley et al., 2016; Gotham et al., 2015).

When we consider these results, some conclusions seem to be in order. First, the bulk of research evidence indicates that, when focusing on reasonably large samples of youth with ID who self-reported their symptoms of anxiety, differences related to age (i.e., decline), and sex (i.e., lower levels among

boys) mimic those typically reported among TD populations. Second, despite some consistency in developmental trends, research focusing on parental reports of anxiety among youth with ID does not seem to entirely converge with research focusing on youth's self-reports. This observation clearly highlights the need for further replication efforts, particularly in relation to the effects of ID levels and comorbid conditions, as well as for comparative research in which both types of reports are jointly considered. Furthermore, our results suggest that researchers and educators aiming to address the needs of youth with mild and moderate levels of ID should prioritize research evidence in which the voice and agency of youth with ID has been taken into consideration, as their unique perspective seems to differ from that of their primary caregivers.

### **School Experiences and Youth's Trajectories of Anxiety**

Consistent with our expectations, anchored in SDT (Ryan & Deci, 2017) and stage-environment fit theory (e.g., Eccles et al., 1993), our results support the idea that all three components (interpersonal, organizational, and instructional) of school experiences had a complementary role to play in influencing the development of anxiety trajectories among youth with ID.

**5.3.1. Interpersonal.** According to attachment theory (e.g., Bowlby, 1973), SDT (Ryan & Deci, 2017), and stage-environment fit theory (e.g., Eccles et al., 1993), we anticipated that youth's perceptions of the quality of their schools' between-student relational climate, student-teacher relational climate, and bonding climate would all be related to lower levels of anxiety. Our results indicated that none of these components of youth's school experiences were associated with their initial levels of anxiety or with the shape of their longitudinal trajectories of anxiety. Rather, our results revealed momentary effects of some of these components on time-specific fluctuations in youth's levels of anxiety. More precisely, and in agreement with previous results (e.g., Klein et al., 2018), we found that momentary increases in perceptions of the between-student relational climate were associated with momentary decreases in youth's levels of anxiety. In other words, when youth are exposed to a particularly positive between-student relational climate in any given year, their levels of anxiety appear to benefit from this exposure in the same school year. Unfortunately, these momentary effects are not strong enough to generate change in youth anxiety trajectories, although they are able to help them achieve at least a momentary reprieve from these symptoms.

In contrast, momentary increases in perceptions of the student-teacher relational climate were unexpectedly associated with time-specific increases in their levels of anxiety. As youth with ID tend to rely more heavily on adult caregivers (e.g., Craven et al., 2015), our results suggest that they may attribute this momentary increase in their perception of the student-teacher relational climate as one that does not occur randomly, but rather to compensate for their own limitations, leading them to experience additional pressure to appear worth these additional efforts on the part of their teachers. This felt pressure may explain why these momentary increases lead to matching increases in youth's levels of anxiety in the same school year. This speculative explanation would deserve more extensive investigations specifically focused on replicating and explaining this unexpected association.

Lastly, the lack of effects of youth's perceptions of their school bonding climate suggests that this component of their school experiences may simply be less important for youth with mild and moderate levels of ID than the other interpersonal components of their school experiences. Interestingly, multivariate research accounting for multiple components of youth's school experiences among samples of TD adolescents has also found that the effects of bonding climate perceptions tended to become smaller once all components of youth school experiences were considered (Morin et al., 2009 2013), consistent with the theoretical positioning of this school climate component as representing a synthesis of all other school climate perceptions (Janosz et al., 1998, 2007). Alternatively, it is also possible that bonding might be a difficult concept to grasp for youth with mild and moderate levels of ID, which would then explain why this component appears less relevant for them than among TD youth (e.g., Goldstein et al., 2015; Shochet et al., 2006).

**5.3.2. Organizational.** Contrasting with the interpersonal component of youth's school experience, all three facets of the organizational component considered in this study (i.e., peer victimization, safety climate, and fairness climate) were found to share significant associations with anxiety. First, and as expected, initial levels of victimization were related to higher initial levels of anxiety, while initial safety climate perceptions were related to lower initial levels of anxiety. Moreover, and providing further support to the importance of peer victimization for youth with ID more generally (Maïano, et al., 2016) and as a driver of internalizing disorders such as anxiety more specifically (e.g.,

Chiu et al., 2017; Doyle & Sullivan, 2017; Olivier et al., 2020; Reiter & Lapidot-Leffler, 2007; Ung et al., 2016; Whitney et al., 2019; Wright, 2017), our results showed that stable or momentary increases in victimization were also respectively associated with increasing trajectories of anxiety and with momentary increases in anxiety among youth with mild and moderate levels of ID.

When considering the balance between security and autonomy, we unexpectedly found that momentary increases in youth's perceptions of the fairness climate of their school were related to momentary increases in their levels of anxiety in the same school year, thus mimicking the results observed for teacher-students relational climate. Given the multivariate nature of our analyses, these results cannot be interpreted in disconnection from the fact that youth who were more frequently victimized within a year also experienced momentary increases in their levels of anxiety. On this basis, these unexpected associations could potentially reflect social comparison processes (e.g., Gerber et al., 2018), suggesting that when youth with mild and moderate levels of ID who experience an increase in victimization in a given year also feel that teachers are fair and supportive toward all students, including their aggressors, they might experience a momentary increase in their levels of anxiety. Fortunately, these effects do not generalize to their overarching trajectories of anxiety.

**5.3.3. Instructional.** The lack of associations between achievement and anxiety found in the present study might possibly be related to our focus on youth with mild and moderate levels of ID. Indeed, due to their unique cognitive limitations, schooling most typically focuses on mastery and effort, rather than performance and achievement, for youth with mild and moderate levels of ID (e.g., Deshler et al., 2001; Fuchs et al., 1997). In contrast, our results showed that more positive perceptions of the school educational climate were related to lower initial levels of anxiety among youth with mild and moderate levels of ID, and that momentary increases in these perceptions were themselves associated with similar decreases in their levels of anxiety during the same school year. However, and unexpectedly, higher initial perceptions of the school educational climate were also found to limit the normative rate of decrease in anxiety trajectories among youth with mild and moderate levels of ID. In other words, anxiety levels do not decrease as quickly among youth with mild and moderate levels of ID who perceived that their school values learning, mastery, and competence. We can offer two speculative explanations for this result. First, as youth with mild and moderate levels of ID get older and more advanced academically, they become increasingly confronted with their own limitations (Craven et al., 2015). In this context, attending a school that places a high level of importance on learning and achievement may progressively generate increasing levels of anxiety. Second, our measure of educational climate did not differentiate between mastery and performance goals, highlighting a focus on education that encapsulates both types of goals. Thus, as a complement to the first explanation, youth with mild and moderate levels of ID may also become progressively more aware of the focus on performance goals (Bong, 2009), leading them to experience increasing levels of anxiety about their ability to match these educational standards (Furner & Gonzalez-DeHass, 2011), a concern that is quite prevalent among youth with ID (Datta et al., 2013). Future research is needed to verify these interpretations and unpack the mechanisms underlying these associations.

Generally, our results go beyond supporting the key role of peer victimization for anxiety development of among youth with mild and moderate levels of ID, to highlight the complementary role of many components of school experiences that can be modified via interventions, including their perceptions of the school relational, educational, safety, and fairness climates.

#### **5.4 Limitations**

Some limitations must be acknowledged in relation to our results. First, this study relied on a convenience sample of youth with mild to moderate levels of ID recruited in Australia and Canada, thus limiting the generalizability of our findings. This limitation is quite important considering the conflicting findings reported in previous research regarding the role of individual characteristics as predictors of anxiety among youth with ID (Botting et al., 2016; Chester et al., 2013; Einfeld et al., 2006; Gotham et al., 2015; Hermans et al., 2013; Maïano et al., 2023; Rodas et al., 2020; Rojahn et al., 2011). Future studies should thus seek to replicate our results among new, and more diversified, samples of youth with a wider range of ID levels recruited from different countries and educational contexts. Second, despite the longitudinal nature of this study, it remains impossible to infer directionality or causality. For instance, it is possible that increases in anxiety may also be contributing to increases in peer victimization or to decreases in school climate perceptions (e.g., Hodges & Perry, 1999). Future studies may want to use a bidirectional research design to specifically investigate the reciprocal

associations between these variables, while accounting for a wider range of possible confounders. Third, whereas this is also a strength of this study, our almost total reliance (except for teachers' ratings of achievement) on self-report questionnaires also limits the generalizability of our results to students' perceptions, making it impossible to reach conclusions regarding the role played by objective school characteristics in relation to clinically measured diagnostics of anxiety. Finally, considering our unexpected findings, it would be interesting for future studies to explicitly assess some of the mechanisms potentially involved in these effects (e.g., achievement goals and goal structures, social comparisons, etc.).

## 6. Conclusion

The present study is the first to explicitly capture the unique perspectives of youth with mild and moderate levels of ID in relation to how their longitudinal trajectories of anxiety may relate to their school experiences over the course of adolescence. In this regard, our results revealed a slight normative decreasing trend in anxiety over the course of adolescence, in addition to clearly demonstrating the role of school violence as a core driver of anxiety among youth with mild and moderate levels of ID. Perhaps more importantly, they reveal that a variety of other components of youth's school experience, under the control of schools and teachers, also seem to play a role in this development. Although some of our unexpected results may be specific to the present sample, highlighting the need for replication, many of these results are consistent with previous research conducted among youth with ID and TD youth, reinforcing their potential importance. Incidentally, our results tentatively suggest that school interventions aimed at elevating youth's perspective of a safe, peer supportive, and goal-oriented learning environment will translate into lower levels of anxiety over time. By suggesting that the perspective of youth with mild and moderate levels of ID may differ from those of their significant others, our results therefore suggest that prioritizing the voice and agency of these youth could be essential for future research and intervention.

## 7. References

- Ainsworth, M.S. (1989). Attachments beyond infancy. *American Psychologist*, *44*, 709-716.
- Aldridge, J.M., & McChesney, K. (2018). The relationships between school climate and adolescent mental health and wellbeing: A systematic literature review. *International Journal of Educational Research*, *88*, 121-145.
- American Psychological Association [APA]. (2000). *Diagnostic and Statistical Manual of Mental Disorders (4th edition, text revised)*. APA.
- American Psychological Association [APA]. (2022). *Diagnostic and Statistical Manual, Fifth Edition Text Revised (DSM-V-TR)*. APA.
- Asparouhov, T., & Muthén, B. (2010). *Mplus Technical Appendix: Weighted least squares estimation with missing data*. Muthén & Muthén.
- Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling*, *16*, 397-438.
- Asparouhov, T., Muthén, B., & Morin, A.J.S. (2015). Bayesian structural equation modeling with crossloadings and residual covariances. *Journal of Management*, *41*, 1561-1577.
- Austin, K. L., Hunter, M., Gallagher, E., & Campbell, L. E. (2018). Depression and anxiety symptoms during the transition to early adulthood for people with intellectual disabilities. *Journal of Intellectual Disability Research*, *62*(5), 407-421.
- Bandelow, B., & Michaelis, S. (2015). Epidemiology of anxiety disorders in the 21st century. *Dialogues in Clinical Neuroscience*, *17*, 327-335.
- Baxter, A., Scott, K., Vos, T., & Whiteford, H. (2013). Global prevalence of anxiety disorders: A systematic review and meta-regression. *Psychological Medicine*, *43*, 897-910.
- Bear, G.G., Minke, K.M., & Manning, M.A. (2002). Self-concept of students with learning disabilities: A meta-analysis. *School Psychology Review*, *31*, 405-427.
- Beesdo-Baum, K., & Knappe, S. (2012). Developmental epidemiology of anxiety disorders. *Child and Adolescent Psychiatric Clinics*, *21*, 457-478.
- Blacher, J., Baker, B.L., & Eisenhower, A.S. (2009). Student-teacher relationship stability across early school years for children with intellectual disability or typical development. *American Journal on Intellectual and Developmental Disabilities*, *114*, 322-339.
- Bollen, K.A., & Curran, P.J. (2006). *Latent curve models*. Wiley.
- Bong, M. (2009). Age-related differences in achievement goal differentiation. *Journal of Educational*



- Psychology*, 101, 879-896.
- Botting, N., Toseeb, U., Pickles, A., Durkin, K., & Conti-Ramsden, G. (2016). Depression and anxiety change from adolescence to adulthood in individuals with and without language impairment. *PLoS One*, 11, e0156678.
- Bowlby, J. (1973). *Attachment and Loss, Volume II: Separation, Anxiety and Anger*. Hogarth Press
- Browne, M.W. (2001). An overview of analytic rotation in exploratory factor analysis. *Multivariate Behavioral Research*, 36, 111–150.
- Buckles, J., Luckasson, R., & Keefe, E. (2013). A systematic review of the prevalence of psychiatric disorders in adults with intellectual disability, 2003–2010. *Journal of Mental Health Research in Intellectual Disabilities*, 6, 181–207.
- Chen, F.F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, 14, 464–504.
- Chester, R., Chaplin, E., Tsakanikos, E., McCarthy, J., Bouras, N., & Craig, T. (2013). Gender differences in self-reported symptoms of depression and anxiety in adults with intellectual disabilities. *Advances in Mental Health and Intellectual Disabilities*, 7, 191-200.
- Cheung, G.W., & Rensvold, R.B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233-255.
- Chiu, Y.L., Kao, S., Tou, S.W., & Lin, F.G. (2017). Effect of personal characteristics, victimization types, and family-and school-related factors on psychological distress in adolescents with intellectual disabilities. *Psychiatry Research*, 248, 48-55.
- Costello, E.J., Egger, H.L., & Angold, A. (2005). The developmental epidemiology of anxiety disorders: Phenomenology, prevalence, and comorbidity. *Child and Adolescent Psychiatric Clinics of North America*, 14, 631–648.
- Costello, E.J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, 60, 837-844.
- Craven, R.G., Morin, A.J.S., Tracey, D., Parker, P.D., & Zhong, H.F. (2015). *Inclusive Education for Students with Intellectual Disabilities*. Information Age
- Datta, P. (2013). Is test anxiety a peril for students with intellectual disabilities? *Journal of Intellectual Disabilities*, 17, 122-133.
- Deci, E.L., & Ryan, R.M. (2000). The " what " and " why " of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11, 227-268.
- Deshler, D.D., Schumaker, J.B., Lenz, B.K., Bulgren, J.A., Hock, M.F., Knight, J., & Ehren, B.J. (2001). Ensuring Content-Area Learning by Secondary Students with Learning Disabilities. *Learning Disabilities Research & Practice*, 16, 96-108.
- Diallo, T.M.O., Morin, A.J.S., & Parker, P.D. (2014). Statistical power of latent growth curve models to detect quadratic growth. *Behavior Research Methods*, 46, 357–371.
- Doyle, S.T., & Sullivan, T.N. (2017). Longitudinal relations between peer victimization, emotion dysregulation, and internalizing symptoms among early adolescents. *Journal of Early Adolescence*, 37, 165-191.
- Dubé, C., Olivier, E., Morin, A.J.S., Tracey, D., Craven, R.G., & Maïano, C. (2022). Toward a comprehensive assessment of relationships with teachers and parents for youth with intellectual disabilities. *Journal of Autism and Developmental Disorders*, 52, 2670-2688.
- Eccles, J.S., Midgley, C., Buchanan, C.M., Wigfield, A., Reuman, D., & Iver, D. (1993). Development during adolescence: The impact of stage/environment fit. *American Psychologist*, 48, 90-101.
- Eccles, J.S., & Roeser, R.W. (2009). Schools, academic motivation, and stage-environment fit. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of Adolescent Psychology* (3<sup>rd</sup> ed., pp. 404–434). Wiley.
- Einfeld, S.L., Piccinin, A.M., Mackinnon, A., Hofer, S.M., Taffe, J., Gray, K.M., ... & Tonge, B.J. (2006). Psychopathology in young people with intellectual disability. *JAMA*, 296, 1981-1989.
- Einfeld, S.L., Ellis, L.A., & Emerson, E. (2011). Comorbidity of intellectual disability and mental disorder in children and adolescents: A systematic review. *Journal of Intellectual and Developmental Disability*, 36, 137–143.
- Enders, C.K. (2010). *Applied Missing Data Analysis*. Guilford.
- Finney, S.J., & DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G.R. Hancock, & R.O. Mueller (Eds.). *Structural Equation Modeling: A Second Course* (2<sup>nd</sup> edition, pp. 439-492). Information Age.

- Foley, K.R., Taffe, J., Bourke, J., Einfeld, S.L., Tonge, B.J., Trollor, J., & Leonard, H. (2016). Young people with intellectual disability transitioning to adulthood: Do behaviour trajectories differ in those with and without Down syndrome? *PloS one*, *11*, e0157667.
- Forté, M., Jahoda, A., & Dagnan, D. (2011). An anxious time? Exploring the nature of worries experienced by young people with a mild to moderate intellectual disability as they make the transition to adulthood. *British Journal of Clinical Psychology*, *50*, 398-411.
- Fuchs, L.S., Karns, K., Hamlett, C.L., Katzaroff, M., & Dutka, S. (1997). Effects of task-focused goals on low-achieving students with and without learning disabilities. *American Educational Research Journal*, *34*, 513-543.
- Furner, J.M., & Gonzalez-DeHass, A. (2011). How do students' mastery and performance goals relate to math anxiety? *Eurasia Journal of Mathematics, Science and Technology Education*, *7*, 227-242.
- Gerber, J.P., Wheeler, L., & Suls, J. (2018). A social comparison theory meta-analysis 60+ years on. *Psychological Bulletin*, *144*, 177-197.
- Goldstein, S.E., Boxer, P., & Rudolph, E. (2015). Middle school transition stress: Links with academic performance, motivation, and school experiences. *Contemporary School Psychology*, *19*, 21-29.
- Gotham, K., Brunwasser, S.M., & Lord, C.L. (2015). Depressive and anxiety symptom trajectories from school age through young adulthood in samples with autism spectrum disorder and developmental delay. *Journal of the American Academy of Child and Adolescent Psychiatry*, *54*, 369-376.
- Green, S.A., Berkovits, L.D., & Baker, B.L. (2015). Symptoms and development of anxiety in children with or without intellectual disability. *Journal of Clinical Child & Adolescent Psychology*, *44*, 137-144.
- Hale, W.W. III, Raaijmakers, Q.A.W., Muris, P., van Hoof, A., & Meeus, W.H.J. (2008). Developmental trajectories of adolescent anxiety disorder symptoms: A 5-year prospective study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *47*, 556-564.
- Hale, W.W. III, Raaijmakers, Q.A.W., Muris, P., van Hoof, A., & Meeus, W.H.J. (2009). One factor or two parallel processes? Comorbidity and development of adolescent anxiety and depressive disorders symptoms. *Journal of Child Psychology and Psychiatry*, *50*, 1218-1226.
- Halfon, N., Houtrow, A., Larson, K., & Newacheck, P.W. (2012). The changing landscape of disability in childhood. *The Future of Children*, *22*, 13-42.
- Hamadi, L., & Fletcher, H.K. (2021). Are people with an intellectual disability at increased risk of attachment difficulties? A critical review. *Journal of Intellectual Disabilities*, *25*, 114-130.
- Hermans, H., & Evenhuis, H.M. (2013). Factors associated with depression and anxiety in older adults with intellectual disabilities: results of the healthy ageing and intellectual disabilities study. *International Journal of Geriatric Psychiatry*, *28*, 691-699.
- Hodges, E.V., & Perry, D.G. (1999). Personal and interpersonal antecedents and consequences of victimization by peers. *Journal of Personality and Social Psychology*, *76*, 677-685.
- Hoge, D.R., Smit, E.K., & Hanson, S.L. (1990). School experiences predicting changes in self-esteem of sixth and seventh-grade students. *Journal of Educational Psychology*, *82*, 117-127.
- Holfeld, B., & Baitz, R. (2020). The mediating and moderating effects of social support and school climate on the association between cyber victimization and internalizing symptoms. *Journal of Youth and Adolescence*, *49*, 2214-2228.
- Hollocks, M.J., Lerh, J.W., Magiati, I., Meiser-Stedman, R., & Brugha, T.S. (2019). Anxiety and depression in adults with autism spectrum disorder: a systematic review and meta-analysis. *Psychological Medicine*, *49*, 559-572.
- Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55.
- Hunter, S.C., Boyle, J.M.E., & Warden, D. (2004). Help seeking amongst child and adolescent victims of peer-aggression and bullying: The influence of school-stage, gender, victimisation, appraisal, and emotion. *British Educational Research Journal*, *74*, 375-390.
- Janosz, M., Bouthillier, C., Bowen, F., Chouinard, R., & Desbiens, N. (2007). *Rapport de validation du questionnaire sur l'environnement socioéducatif des écoles primaires*. Université de Montréal.
- Janosz, M., Georges, P., & Parent, S. (1998). L'environnement éducatif à l'école secondaire. *Revue Canadienne de Psychoéducation*, *27*, 285-306.
- Klein, A.M., Houtkamp, E.O., Saleminck, E., Baartmans, J.M.D., Rinck, M., van der Molen, M.J. (2018). Differences between self- and peer-rated likability in relation to social anxiety and depression in

- adolescents with mild intellectual disabilities. *Research in Developmental Disabilities*, *80*, 44-51.
- Lépine, J.P. (2002). The epidemiology of anxiety disorders: prevalence and societal costs. *Journal of Clinical Psychiatry*, *63*, 4-8.
- Li, C.H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, *48*, 936-949.
- Mai, Y., Zhang, Z., & Wen, Z. (2018). Comparing exploratory structural equation modeling and existing approaches for multiple regression with latent variables. *Structural Equation Modeling*, *25*, 737-749.
- Maïano, C., Aimé, A., Salvas, M.-C., Morin, A.J.S., & Normand, C. (2016). Prevalence and correlates of bullying perpetration and victimization among school-aged youth with intellectual disabilities: A systematic review. *Research in Developmental Disabilities*, *49-50*, 181-195.
- Maïano, C., Coutu, S., Tracey, D., Bouchard, S., Lepage, G., Morin, A.J.S., & Moullec, G. (2018). Prevalence of anxiety and depressive disorders among youth with intellectual disabilities: A systematic review and meta-analysis. *Journal of Affective Disorders*, *236*, 230-242.
- Maïano, C., Morin, A.J.S., Gagnon, C., Olivier, E., Tracey, D., Craven, R.G., & Bouchard, S. (2023, In Press). Validation of an adapted version of the Glasgow Anxiety Scale for people with Intellectual Disabilities (GAS-ID). *Journal of Autism and Developmental Disorders*. Early View doi: 10.1007/s10803-021-05398-7
- Marsh, H.W. (2007). Application of confirmatory factor analysis and structural equation modeling in sport/exercise psychology. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology* (3<sup>rd</sup> edition, pp. 774-798). Wiley.
- Marsh, H.W., Hau, K.-T., & Grayson, D. (2005). Goodness of fit evaluation in structural equation modeling. In A. Maydeu-Olivares & J. McArdle (Eds.), *Contemporary Psychometrics* (pp. 275-340). Erlbaum.
- McCall-Hosenfeld, J.S., Mukherjee, S., & Lehman, E.B. (2014). The prevalence and correlates of lifetime psychiatric disorders and trauma exposures in urban and rural settings: Results from the National Comorbidity Survey Replication (NCS-R). *Plos One*, *9*, e112416.
- McDonald, R.P. (1970). Theoretical foundations of principal factor analysis, canonical factor analysis, and alpha factor analysis. *British Journal of Mathematical & Statistical Psychology*, *23*, 1-21.
- Merikangas, K.R., He, J.-P., Burstein, M., Swanson, S.A., Avenevoli, S., Cui, L., Benjet, C., Georgiades, K., & Swendsen, J. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from the National Comorbidity Survey Replication-Adolescent supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*, 980-989.
- Metha, P.D., & West, S.G. (2000). Putting the individual back into individual growth curves. *Psychological Methods*, *5*, 23-43.
- Millsap, R. (2011). *Statistical approaches to measurement invariance*. Taylor & Francis.
- Mindham, J., & Espie, C.A. (2003). Glasgow Anxiety Scale for people with an Intellectual Disability (GAS-ID): Development and psychometric properties of a new measure for use with people with mild intellectual disability. *Journal of Intellectual Disability Research*, *47*, 22-30.
- Morin, A.J.S., Arens, A.K., & Marsh, H.W. (2016). A bifactor exploratory structural equation modeling framework for the identification of distinct sources of construct-relevant psychometric multidimensionality. *Structural Equation Modeling*, *23*, 116-139.
- Morin, A.J.S., Janosz, M., & Larivée, S. (2009). The Montreal Adolescent Depression Development Project (MADDP): School life and depression following high school transition. *Psychiatry Research Journal*, *1*, 1-50.
- Morin, A.J.S., Maïano, C., Marsh, H.W., Nagengast, B., & Janosz, M. (2013). School life and adolescents' self-esteem trajectories. *Child Development*, *84*, 1967-1988.
- Morin, A.J.S., Maïano, C., Nagengast, B., Marsh, H.W., Morizot, J., & Janosz, M. (2011). Growth mixture modeling of adolescents' developmental trajectories of anxiety: The impact of untested invariance assumptions on substantive interpretations. *Structural Equation Modeling*, *18*, 613-648.
- Morin, A.J.S., Myers, N.D., & Lee, S. (2020). Modern factor analytic techniques: Bifactor models, exploratory structural equation modeling (ESEM) and bifactor-ESEM. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology* (4<sup>th</sup> edition, pp. 1044-1073). Wiley.
- Muthén, L., & Muthén, B. (2021). *Mplus User's Guide*. Muthén & Muthén.
- Olivier, E., Azarnia, P., Morin, A.J.S., Houle, S.A., Dubé, C., Tracey, D., & Maïano, C. (2020). The

- moderating role of teacher-student relationships on the association between peer victimization and depression in students with intellectual disabilities. *Research in Developmental Disabilities*, 98, 103572.
- Olivier, E., Lacombe, C., Morin, A.J.S., Houle, S.A., Gagnon, C., Tracey, D., Craven, R.G., & Maïano, C. (2022). Validation of a revised version of the Center for Epidemiologic Depression Scale for youth with intellectual disabilities (CESD-ID-R). *Journal of Autism and Developmental Disorders*, 52, 4554-4567.
- Olivier, E., Morin, A.J.S., Verma, N., Dubé, C., Gagnon, C., Tracey, D., Craven, R.G. & Maïano, C. (2021). Development and validation of a multi-informant measure of social behavior for youth with intellectual disabilities. *Research on Child & Adolescent Psychopathology*, 49, 1649-1667.
- Polanczyk, G.V., Salum, G.A., Sugaya, L.S., Caye, A., & Rohde, L.A. (2015). Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry*, 56, 345-365.
- Reiter, S., & Lapidot-Lefler, N. (2007). Bullying among special education students with intellectual disabilities: Differences in social adjustment and social skills. *Intellectual and Developmental Disabilities*, 45, 174-181.
- Rodas, N.V., Blacher, J., & Baker, B.L. (2020). Predictors of anxiety symptom trajectory in children with or without ID from early childhood to adolescence. *Journal of Mental Health Research in Intellectual Disabilities*, 13, 25-42.
- Roeser, R.W., Eccles, J.S., & Sameroff, A. (2000). School as a context of early adolescents' development: A summary of research findings. *Elementary School Journal*, 100, 443-471.
- Rohner, R.P. (2004). The parental "acceptance-rejection syndrome": universal correlates of perceived rejection. *American Psychologist*, 59, 830-840.
- Roid, G.H., & Miller, L.J. (1997). *Leiter international performance scale revised*. Stoelting.
- Rojahn, J., Rowe, E.W., Kasdan, S., Moore, L., & van Ingen, D.J. (2011). Psychometric properties of the aberrant behavior checklist, the anxiety, depression and mood scale, the assessment of dual diagnosis and the social performance survey schedule in adults with intellectual disabilities. *Research in Developmental Disabilities*, 32, 2309-2320.
- Roza, S.J., Hofstra, M.B., Van Der Ende, J., & Verhulst, F.C. (2003). Stable prediction of mood and anxiety disorders based on behavioral and emotional problems in childhood. *American Journal of Psychiatry*, 160, 2116-2121.
- Ryan, R.M., & Deci, E.L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford.
- Sainio, P.J., Eklund, K.M., Ahonen, T.P., & Kiuru, N.H. (2019). The role of learning difficulties in academic emotions and academic achievement. *Journal of Learning Disabilities*, 52, 287-298.
- Satorra, A., & Bentler, P.M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66, 507-514.
- Shochet, I.M., Dadds, M.R., Ham, D., & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: Results of a community prediction study. *Journal of Clinical Child & Adolescent Psychology*, 35, 170-179.
- Soresi, S., Nota, L., & Wehmeyer, M.L. (2011). Community involvement in promoting inclusion, participation and self-determination. *International Journal of Inclusive Education*, 15, 15-28.
- Steinberg, L., & Morris, A. (2001). Adolescent development. *Annual Review Psychology*, 52, 83-110.
- Swanson, S., & Howell, C. (1996). Test anxiety in adolescents with learning disabilities and behavior disorders. *Exceptional Children*, 62, 389-397.
- Tipton, L.A., Christensen, L., & Blacher, J. (2013). Friendship quality in adolescents with and without an intellectual disability. *Journal of Applied Research in Intellectual Disabilities*, 26, 522-532.
- Tipton-Fisler, L.A., Rodriguez, G., Zeedyk, S.M., & Blacher, J. (2018). Stability of bullying and internalizing problems among adolescents with ASD, ID, or typical development. *Research in Developmental Disability*, 80, 131-141.
- Tonge, B.J., & Einfeld, S.L. (2003). Psychopathology and intellectual disability. *International Review of Research in Mental Retardation*, 26, 61-91.
- Turk, V., Khattran, S., Kerry, S., Corney, R., & Painter, K. (2012). Reporting of health problems and pain by adults with intellectual disabilities and by their carers. *Journal of Applied Research in Intellectual Disabilities*, 25, 155-165.
- Ung, D., McBride, N., Collier, A., Selles, R., Small, B., Phares, V., & Storch, E. (2016). The

- relationship between peer victimization and the psychological characteristics of youth with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 32, 70-79.
- van Oort, F.V.A., Greaves-Lord, K., Verhulst, F.C., Ormel, J., & Huizink, A.C. (2009). The developmental course of anxiety symptoms during adolescence: The TRAILS study. *Journal of Child Psychology and Psychiatry*, 50, 1209–1217.
- Van Steensel, F.J., Bögels, S.M., & Perrin, S. (2011). Anxiety disorders in children and adolescents with autistic spectrum disorders: a meta-analysis. *Clinical Child and Family Psychology Review*, 14, 302-317.
- Vasa, R.A., Kalb, L., Mazurek, M., Kanne, S., Freedman, B., Keefer, A., Clemons, C., & Murray, D. (2013). Age-related differences in the prevalence and correlates of anxiety in youth with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 7, 1358-1369.
- Vasey, M.W., Bosmans, G., & Ollendick, T.H. (2014). The developmental psychopathology of anxiety. In *Handbook of Developmental Psychopathology* (pp. 543-560). Springer.
- Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: Associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology*, 40, 194-213.
- Weaver, C.M., Shaw, D.S., Crossan, J.L., Dishion, T.J., & Wilson, M.N. (2015). Parent–child conflict and early childhood adjustment in two-parent low-income families: Parallel developmental processes. *Child Psychiatry & Human Development*, 46, 94–107.
- Wechsler, D. (2003). *WISC-IV Technical and Interpretive Manual*. Psychological Corporation.
- Wechsler, D., Coalson, D.L., & Raiford, S.E. (2008). *WAIS-IV technical and interpretive manual*. Pearson.
- Wehmeyer, M.L. (2005). Self-determination and individuals with severe disabilities. *Research & Practice for Persons with Severe Disabilities*, 30, 113-120.
- Whitney, D.G., Shapiro, D.N., Peterson, M.D., & Warschausky, S.A. (2019). Factors associated with depression and anxiety in children with intellectual disabilities. *Journal of Intellectual Disability Research*, 63, 408-417.
- Wigfield, A., Byrnes, J.P., & Eccles, J.S. (2006). Development during early and middle adolescence. In P.A. Alexander & Winne (Eds.). *Handbook of Educational Psychology* (pp. 87-113). Erlbaum.
- Woodward, L.J., & Fergusson, D.M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1086–1093.
- Wright, M.F. (2017). Cyber victimization and depression among adolescents with intellectual disabilities and developmental disorders: The moderation of perceived social support. *Journal of Mental Health Research in Intellectual Disabilities*, 10, 126-143.
- Young, R., Dagnan, D., & Jahoda, A. (2016). Leaving school: a comparison of the worries held by adolescents with and without intellectual disabilities. *Journal of Intellectual Disability Research*, 60, 9-21.
- Young-Southward, G., Cooper, S.A., & Philo, C. (2017). Health and wellbeing during transition to adulthood for young people with intellectual disabilities: A qualitative study. *Research in Developmental Disabilities*, 70, 94-103.

**Table 1***Goodness-of-Fit Results from the Latent Curve Models with Predictors*

Models	$\chi^2$	df	CFI	TLI	RMSEA (90% CI)
<i>Youth's Personal Characteristics</i>					
Model 1: Null model	23.372*	13	.964	.958	.045 (.011; .074)
Model 2: Prediction of the Intercepts	11.891*	9	.990	.983	.029 (.000; .067)
Model 3: Prediction of the Intercepts and Slopes	9.163*	5	.985	.956	.046 (.000; .092)
<i>Theoretical Predictors</i>					
Model 1: Null model	186.480*	53	.691	.668	.079 (.066, .091)
Model 2: Intercepts predict intercepts	83.849*	45	.907	.883	.047 (.031, .062)
Model 3: Model 2 + intercepts predict slopes	71.742*	37	.918	.873	.049 (.031, .065)
Model 4: Model 3 + slopes predict slopes	34.975*	29	.986	.972	.023 (.000, .047)
<i>Time-Varying Predictors</i>					
Model 1: Null model	156.197*	51	.762	.622	.072 (.060; .085)
Model 2: Time-varying predictions equal over time	52.256*	43	.979	.961	.023 (.000, .043)
Model 3: Time-varying predictions free to vary over time	28.136*	27	.997	.992	.010 (.000, .041)

Note. \* $p < .01$ ;  $\chi^2$ : 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 2***Relations Between the Predictors and Anxiety at the Trajectory Level (Model 4)*

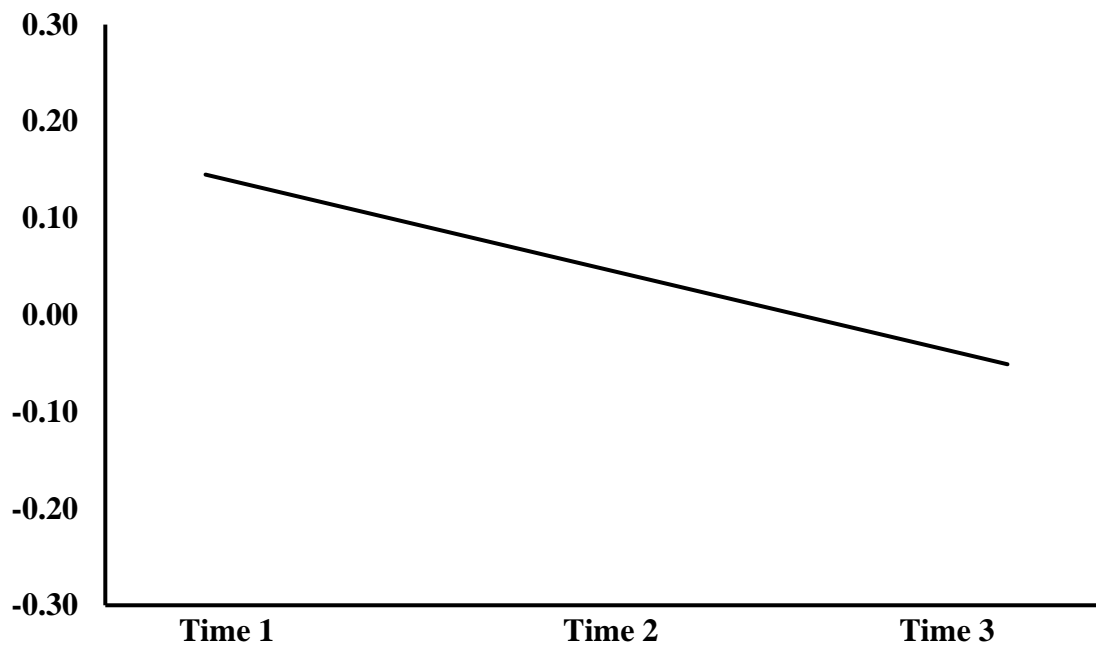
<i>Predictors (Intercepts)</i>	Intercept factor		Linear slope factor	
	b (SE)	$\beta$	b (SE)	$\beta$
Academic Achievement	-.024 (.129)	-.023	.062 (.052)	.206
Victimization	.383 (.076)**	.355	.101 (.060)	.319
Safety Climate	-.277 (.104)**	-.204	-.046 (.073)	-.115
Bonding Climate	-.070 (.106)	-.069	.057 (.062)	.192
Between-Students Relational Climate	-.094 (.153)	-.070	.095 (.141)	.240
Teacher-Student Relational Climate	.294 (.151)	.198	-.151 (.099)	-.347
Fairness Climate	.218 (.118)	.138	-.045 (.074)	-.097
Educational Climate	-.335 (.110)**	-.243	.270 (.089)**	.667
<i>Predictors (Slopes)</i>				
Academic Achievement			.017 (.103)	.024
Victimization			1.542 (.334)**	.650
Safety School Climate			-.738 (1.082)	-.087
Bonding School Climate			-.036 (.099)	-.035
Between-Students Relational Climate			-.650 (.886)	-.280
Teacher-Student Relational Climate			-.166 (.258)	-.107
Fairness Climate			-.671 (.393)	-.342
Educational Climate			-.069 (.138)	-.084

Note. \* $p < .05$ ; \*\* $p < .01$ . b = unstandardized regression coefficients;  $\beta$  = standardized regression coefficients; SE = standard errors of the coefficients.

**Table 3***Time-Invariant Associations between the Predictors and Anxiety (Model 2)*

<i>Predictors</i>	Invariant	Time 1	Time 2	Time 3
	b (SE)	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)
Academic Achievement	.010 (.098)	.010 (.095)	.010 (.102)	.011 (.102)
Victimization	.295 (.050)**	.297 (.052)**	.293 (.051)**	.288 (.049)**
Safety Climate	-.080 (.049)	-.081 (.050)	-.079 (.048)	-.077 (.047)
Bonding Climate	-.009 (.051)	-.010 (.054)	-.010 (.056)	-.009 (.052)
Between-Students Relational Climate	-.134 (.058)*	-.143 (.061)*	-.148 (.063)*	-.140 (.061)*
Teacher-Student Relational Climate	.239 (.062)**	.245 (.064)**	.263 (.066)**	.267 (.070)**
Fairness Climate	.182 (.052)**	.188 (.053)**	.193 (.055)**	.203 (.059)**
Educational Climate	-.254 (.066)**	-.275 (.072)**	-.285 (.074)**	-.295 (.078)**

Note. \* $p < .05$ ; \*\* $p < .01$ . b = unstandardized regression coefficients;  $\beta$  = standardized regression coefficients; SE = standard errors of the coefficients.



**Figure 1.** Average Anxiety Trajectories Observed in this Sample

Note. Anxiety levels have a mean of 0 and a SD of 1 over time.



## Online Supplements for

## School Experiences and Anxiety Trajectories among Youth with Intellectual Disabilities

**Table S1***Goodness-of-Fit Results from Time Specific Measurement Models*

Models	$\chi^2$	df	CFI	TLI	RMSEA (90% CI)
<i>Global Anxiety</i>					
Time 1	356.485**	249	.983	.976	.035 (.027, .043)
Time 2	382.550**	249	.970	.958	.047 (.038, .057)
Time 3	336.541**	249	.984	.977	.040 (.028, .051)
<i>Academic Achievement</i>					
Time 1	14.164**	4	.999	.997	.096 (.045, .152)
Time 2	25.785**	4	.995	.989	.194 (.127, .268)
Time 3	4.917	4	1.000	1.000	.040 (.000, .136)
<i>Victimization and School Safety Climate</i>					
Time 1	469.160**	188	.970	.967	.064 (.057, .072)
Time 2	288.267**	188	.975	.972	.047 (.036, .058)
Time 3	393.109**	188	.965	.961	.072 (.062, .082)
<i>Other Facets of the School Climate</i>					
Time 1	530.507**	246	.982	.973	.056 (.050, .063)
Time 2	455.910**	246	.984	.976	.060 (.051, .068)
Time 3	487.022**	246	.979	.968	.068 (.059, .077)

*Note.* \* $p < .01$ ;  $\chi^2$ : 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;  $\Delta$ : Change in model fit relative to the comparison model

**Table S2***Goodness-of-Fit Results from the Longitudinal Tests of Measurement Invariance across Time 1-3*

Models	$\chi^2$	df	CFI	TLI	RMSEA (90% CI)	CM	$\Delta\chi^2$	$\Delta$ df	$\Delta$ CFI	$\Delta$ TLI	$\Delta$ RMSEA
<i>Global Anxiety</i>											
1. Configural	3055.637*	2805	.982	.979	.016 (.011-.020)	—	—	—	—	—	—
2. Weak	3219.530*	2989	.983	.982	.015 (.010-.019)	1	204.875	184	+0.001	+0.003	-.001
3. Strong	3365.074*	3143	.984	.983	.014 (.009-.018)	2	154.578	154	+0.001	+0.001	-.001
4. Strict	3408.993*	3197	.984	.984	.014 (.008-.018)	3	60.891	54	.000	+0.001	.000
5. Variance-covariance	3462.562*	3217	.982	.982	.015 (.010-.018)	4	35.29	20	-.002	-.002	+0.001
6. Latent Means	3530.387*	3225	.977	.977	.016 (.012-.020)	5	35.649*	8	-.005	-.005	+0.001
<i>Academic Achievement</i>											
1. Configural	155.869*	69	.995	.992	.062 (.049, .075)	—	—	—	—	—	—
2. Weak	163.970*	77	.995	.993	.059 (.046, .071)	7	2.786	8	.000	+0.001	-.003
3. Strong	186.025*	105	.995	.995	.049 (.037, .060)	8	22.813	28	.000	+0.002	-.010
4. Strict	203.143*	115	.995	.995	.048 (.037, .059)	9	23.943*	10	.000	.000	-.001
5. Correlated Uniquenesses	206.378*	117	.995	.995	.048 (.037, .059)	10	4.277	2	.000	.000	.000
6. Variance-covariance	217.149*	119	.994	.995	.050 (.039, .061)	11	8.569	2	-.001	.000	+0.002
7. Latent Means	190.609*	121	.996	.997	.041 (.030, .053)	12	0.041	2	+0.002	+0.002	-.009
<i>Victimization and School Safety Climate</i>											
1. Configural	2124.945*	1812	.976	.975	.022 (.017, .025)	—	—	—	—	—	—
2. Weak	2160.695*	1850	.977	.975	.021 (.017, .025)	14	36.131	38	+0.001	.000	-.001
3. Strong	2308.862*	2006	.977	.978	.020 (.016, .024)	15	175.197	156	.000	+0.003	-.001
4. Strict	2366.256*	2048	.976	.977	.021 (.016, .024)	16	75.095*	42	-.001	-.001	+0.001
5. Variance-covariance	2410.616*	2054	.973	.974	.022 (.018, .025)	17	18.260*	6	-.003	-.003	+0.001
6. Latent Means	2513.431*	2058	.966	.967	.025 (.021, .028)	18	33.452*	4	-.007	-.007	+0.003
<i>Other Facets of the School Climate</i>											
1. Configural	3427.568*	2953	.985	.983	.021 (.017, .024)	—	—	—	—	—	—
2. Weak	3680.742*	3183	.985	.983	.021 (.017, .023)	20	341.339*	230	.000	.000	.000
3. Strong	3799.440*	3339	.986	.985	.019 (.016, .022)	21	113.025	156	+0.001	+0.002	-.002
4. Strict	3910.906*	3395	.984	.984	.020 (.017, .023)	22	118.206*	56	-.002	-.001	+0.001
5. Correlated Uniquenesses	3917.126*	3399	.984	.983	.020 (.017, .023)	23	13.831*	4	.000	-.001	.000
6. Variance-covariance	3942.436*	3429	.984	.984	.020 (.017, .023)	24	56.723*	30	.000	+0.001	.000
7. Latent Means	4199.781*	3549	.980	.980	.022 (.019, .025)	25	8.279	120	-.004	-.004	+0.002

Note. \* $p < .01$ ;  $\chi^2$ : 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;  $\Delta$ : Change in model fit relative to the comparison model.

**Table S3***Standardized Results from the Longitudinal Variance-Covariance Invariant Global Anxiety Model*

	Worries ( $\lambda$ )	Fears ( $\lambda$ )	PS ( $\lambda$ )	Global ( $\lambda$ )	$\delta$						
Item 1	.390**	-.088*	-.032	.622**	.452**						
Item 2	.501**	.135**	.120**	.380**	.571**						
Item 3	.551**	.038	.022	.502**	.443**						
Item 4	.599**	-.04	-.032	.581**	.300**						
Item 5	.458**	-.085**	.106**	.668**	.326**						
Item 6	.475**	-.021	.237**	.563**	.400**						
Item 7	.313**	-.041	-.076	.676**	.437**						
Item 8	.365**	-.013	-.167**	.650**	.416**						
Item 9	-.340**	-.046	-.126*	.200**	.827**						
Item 10	.421**	.034	.171**	.498**	.544**						
Item 11	.000	.525**	.012	.549**	.423**						
Item 12	.063	.441**	.077	.551**	.493**						
Item 13	.052	-.052	.373**	.659**	.418**						
Item 14	-.166**	.352**	-.107	.491**	.596**						
Item 15	-.008	.409**	.213**	.465**	.571**						
Item 16	-.069	.180**	.110*	.618**	.569**						
Item 17	-.047	-.046	-.151**	.792**	.346**						
Item 18	-.032	-.014	-.108**	.816**	.321**						
Item 19	-.075**	.074	.025	.850**	.265**						
Item 20	.024	.126	.311**	.632**	.488**						
Item 21	.134**	.038	.467**	.622**	.376**						
Item 22	.080**	.033	.46**	.656**	.351**						
Item 23	.121**	-.054	.404**	.560**	.506**						
Item 24	-.045	-.015	.234**	.720**	.425**						
Item 25	-.047	.016	.205**	.622**	.568**						
Item 26	.071	-.058	.302**	.687**	.429**						
Item 27	.064*	.084*	.336**	.733**	.339**						
$\omega$	.747	.568	.680	.954							
Latent Correlations	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Worries (T1)	—										
2. Fears (T1)	.000	—									
3. PS (T1)	.000	.000	—								
4. Global (T1)	.000	.000	.000	—							
5. Worries (T2)	.320**	-.240*	-.004	-.060	—						
6. Fears (T2)	.169*	.494**	-.141	-.012	.000	—					
7. PS (T2)	.176*	-.238	.682**	-.037	.000	.000	—				
8. Global (T2)	.046	-.054	.050	.601**	.000	.000	.000	—			
9. Worries (T3)	.323**	-.200	.116	.051	.494**	.099	.269**	.009	—		
10. Fears (T3)	.071	.502**	.104	-.008	-.149	.841**	.043	.051	.000	—	
11. PS (T3)	.054	-.012	.625**	-.293**	.139	-.005	.596**	-.106	.000	.000	—
12. Global (T3)	.066	-.021	.064	.570**	-.130	-.236*	.140	.696**	.000	.000	.000

Note. \* $p < .05$ ; \*\* $p < .01$ ; PS: Physiological Symptoms;  $\lambda$ : Factor loading;  $\delta$ : Item uniqueness;  $\omega$  = Omega coefficient of composite reliability; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S4**

*Standardized Results from the Longitudinal Variance-Covariance Invariant CFA Models for Achievement, Victimization, and School Safety Climate*

	Academic Achievement		Victimization		School Safety Climate			$\delta$
	$(\lambda)$		$(\lambda)$		$(\lambda)$			
Item 1	.905**							.181**
Item 2	.926**							.143**
Item 3	.907**							.177**
Item 4	.918**							.157**
Item 5	.968**							.062**
Item 1			.740**					.453**
Item 2			.719**					.482**
Item 3			.818**					.330**
Item 4			.804**					.354**
Item 5			.799**					.362**
Item 6			.825**					.320**
Item 7			.828**					.314**
Item 8			.808**					.347**
Item 9			.823**					.322**
Item 10			.805**					.351**
Item 11			.853**					.272**
Item 12			.785**					.384**
Item 13			.850**					.277**
Item 14			.733**					.463**
Item 15			.811**					.342**
Item 16			.866**					.250**
Item 17			.854**					.270**
Item 18					.730**			.467**
Item 19					.793**			.372**
Item 20					.687**			.528**
Item 21					.719**			.483**
$\omega$	.967		.970		.823			
Latent Correlations	1.	2.	3.	4.	5.	6.	7.	8.
1. Academic Achievement (T1)	—							
2. Academic Achievement (T2)	.695**	—						
3. Academic Achievement (T3)	.695**	.897**	—					
4. Victimization (T1)	—	—	—	—				
5. School Safety Climate (T1)	—	—	—	-.541**	—			
6. Victimization (T2)	—	—	—	.633**	-.278**	—		
7. School Safety Climate (T2)	—	—	—	.369**	-.456**	.541**	—	
8. Victimization (T3)	—	—	—	.511**	-.283**	.554**	.367**	—
9. School Safety Climate (T3)	—	—	—	.393**	-.414**	.465**	.435**	.541**

*Note.* \* $p < .05$ ; \*\* $p < .01$ ;  $\lambda$ : Factor loading;  $\delta$ : Item uniqueness;  $\omega$  = Omega coefficient of composite reliability; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S5**

*Standardized Factor Loadings and Uniquenesses from the Longitudinal Variance-Covariance Invariant Model for School Bonding, Relational, Justice, and Educational Climates*

	School Bonding ( $\lambda$ )	Between-Students Relational ( $\lambda$ )	Teacher-Student Relational ( $\lambda$ )	Justice ( $\lambda$ )	Educational ( $\lambda$ )	$\delta$
Item 1	.773**	-.035	.093*	.058	-.019	.321**
Item 2	.867**	.016	-.051	.043	.002	.243**
Item 3	.793**	.146**	-.013	.077	-.268**	.407**
Item 4	.904**	-.056*	.031	-.067**	.085*	.172**
Item 5	.036	.766**	.061	.065*	-.058	.312**
Item 6	.021	.649**	-.002	.020	.199**	.345**
Item 7	.000	.853**	-.039	.044	.035	.240**
Item 8	-.003	.553**	.190**	-.010	.168**	.343**
Item 9	.073*	.758**	.065	.045	-.015	.254**
Item 10	.126**	.174**	.537**	.035	.118**	.253**
Item 11	.096*	.061	.480**	.156**	.171**	.314**
Item 12	.126**	.077*	.520**	.067	.136**	.349**
Item 13	.014	.086**	.766**	.080**	.039	.170**
Item 14	.114**	.061*	.532**	.046	.253**	.217**
Item 15	.088**	.121**	.695**	.080**	.010	.205**
Item 16	.000	.170**	.099*	.703**	-.131*	.408**
Item 17	.117**	.028	-.041	.548**	.146*	.487**
Item 18	-.047	.151**	-.055	.687**	.018	.463**
Item 19	.078*	.134**	-.057	.620**	.077	.415**
Item 20	.018	-.170**	.025	.703**	.122*	.456**
Item 21	-.028	-.149**	.026	.806**	.002	.445**
Item 22	-.022	.219**	.025	-.046	.699**	.322**
Item 23	.080*	.257**	.034	-.091**	.644**	.286**
Item 24	-.050	.001	.026	.133**	.729**	.331**
Item 25	.089*	-.024	.061	-.020	.764**	.302**
Item 26	.051	-.080*	.029	-.009	.840**	.297**
Item 27	.032	-.070	.020	.180**	.674**	.357**
Item 28	.085*	-.020	.076	.186**	.684**	.326**
$\omega$	.907	.896	.892	.861	.919	

*Note.* \* $p < .05$ ; \*\* $p < .01$ ;  $\lambda$ : Factor loading;  $\delta$ : Item uniqueness;  $\omega$  = Omega coefficient of composite reliability; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S6**

*Latent Factor Correlations from the Longitudinal Variance-Covariance Invariant for School Bonding, Relational, Justice, and Educational Climates*

Latent Correlations	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Bonding (T1)	—													
2. Between-Students Rel. (T1)	.591**	—												
3. Teacher-Student Rel. (T1)	.566**	.674**	—											
4. Justice (T1)	.452**	.503**	.540**	—										
5. Educational (T1)	.587**	.609**	.709**	.706**	—									
6. Bonding (T2)	.586**	.438**	.350**	.302**	.332**	—								
7. Between-Students Rel. (T2)	.563**	.512**	.356**	.321**	.332**	.591**	—							
8. Teacher-Student Rel. (T2)	.556**	.475**	.472**	.325**	.343**	.566**	.674**	—						
9. Justice (T2)	.337**	.186*	.211**	.381**	.283**	.452**	.503**	.540**	—					
10. Educational (T2)	.391**	.269**	.235**	.261**	.426**	.587**	.609**	.709**	.706**	—				
11. Bonding (T3)	.531**	.396**	.381**	.153*	.369**	.733**	.571**	.539**	.363**	.463**	—			
12. Between-Students Rel. (T3)	.441**	.583**	.469**	.165*	.313**	.433**	.702**	.528**	.302**	.466**	.591**	—		
13. Teacher-Student Rel. (T3)	.464**	.508**	.436**	.222**	.439**	.528**	.530**	.651**	.327**	.479**	.566**	.674**	—	
14. Justice (T3)	.325**	.195*	.190*	.283**	.360**	.376**	.206**	.284**	.432**	.443**	.452**	.503**	.540**	—
15. Educational (T3)	.438**	.393**	.378**	.237**	.555**	.515**	.385**	.436**	.434**	.682**	.587**	.609**	.709**	.706**

*Note.* \* $p < .05$ ; \*\* $p < .01$ ; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S7***Parameter Estimates from the Predictor Latent Curve Models*

	Academic Achievement			Victimization			Safety			Bonding		
<i>Growth Parameters</i>												
	Intercept		Slope	Intercept		Slope	Intercept		Slope	Intercept		Slope
Mean	-.031(.069)		.025(.022)	.222**(.048)		-.145**(.026)	-.129**(.048)		.096**(.030)	.023(.049)		-.059*(.026)
Variance	.595**(.071)		.040**(.009)	.610**(.081)		.039(.040)	.452**(.089)		.011(.048)	.685**(.087)		.107**(.038)
<i>Standardized Correlations between Intercept and Linear slope factors</i>												
	.189(.115)			-.476**(.127)			-.298(.359)			-.248*(.123)		
<i>Standardized Residuals</i>												
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
	.259**	.063**	.011**	.255**	.299**	.394**	.456**	.424**	.461**	.237**	.253**	.016
	(.054)	(.017)	(.001)	(.075)	(.305)	(.105)	(.102)	(.049)	(.127)	(.076)	(.032)	(.077)
	Between-Students Rel.			Teacher-Student Rel.			Justice			Educational		
<i>Growth Parameters</i>												
	Intercept		Slope	Intercept		Slope	Intercept		Slope	Intercept		Slope
Mean	-.048(.047)		.036(.026)	.010(.047)		.003(.034)	.015(.048)		-.001(.035)	.002(.047)		-.030(.029)
Variance	.431**(.079)		.019(.015)	.409**(.099)		.073(.064)	.402**(.109)		.074(.069)	.295**(.097)		.084**(.016)
<i>Standardized Correlations between Intercept and Linear slope factors</i>												
	.704(.611)			.124(.433)			-.158(.324)			.886(.466)		
<i>Standardized Residuals</i>												
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
	.530**	.310**	.138**	.522**	.381**	.203	.540**	.478**	.406**	.661**	.386**	.006
	(.084)	(.045)	(.049)	(.117)	(.047)	(.128)	(.120)	(.059)	(.154)	(.108)	(.042)	(.055)

Note. \* $p < .05$ ; \*\* $p < .01$ . Standard error of the coefficients are reported in parentheses.

**Table S8**

Time Invariant Factor Scores (with a mean of 0 and a SD of 1) Correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1. Global Anxiety (T1)												
2. Worries (T1)	.082											
3. Fears (T1)	.125*	-.125*										
4. PS (T1)	.157**	-.053	-.029									
5. Academic Achievement (T1)	-.134	-.013	-.047	.092								
6. Victimization (T1)	.411**	.137*	.036	.148**	-.134							
7. Safety (T1)	-.336**	-.075	.005	-.059	.098	-.585**						
8. Bonding (T1)	-.116*	-.067	.08	.022	-.056	-.156**	.243**					
9. Between-Students Rel. (T1)	-.123*	-.119*	.083	.021	.072	-.223**	.287**	.671**				
10. Teacher-Student Rel. (T1)	-.028	-.076	.089	.128*	.022	-.166**	.246**	.622**	.775**			
11. Justice (T1)	.004	-.021	.046	.077	-.020	-.105*	.209**	.564**	.617**	.628**		
12. Educational (T1)	-.107*	.026	.042	.126*	.145	-.126*	.240**	.640**	.682**	.790**	.780**	
13. Global Anxiety (T2)	.674**	.110	-.079	.148*	.106	.270**	-.266**	-.154*	-.134*	-.019	-.040	-.089
14. Worries (T2)	-.053	.475**	-.360**	.001	.008	.036	-.045	-.106	-.098	-.03	-.074	.051
15. Fears (T2)	.014	.157*	.700**	-.148*	.102	-.024	.056	.098	.087	.084	-.012	.086
16. PS (T2)	.011	.232**	-.322**	.825**	.201*	.104	-.059	-.048	-.003	.089	-.012	.106
17. Academic Achievement (T2)	-.067	.074	-.068	.041	.797**	-.186*	.071	-.042	.116	.043	.036	.189*
18. Victimization (T2)	.390**	.196**	-.079	.088	-.126	.692**	-.376**	-.280**	-.216**	-.125	-.149*	-.162*
19. Safety (T2)	-.370**	-.171**	.086	-.039	.110	-.450**	.563**	.291**	.314**	.217**	.275**	.331**
20. Bonding (T2)	-.177**	-.234**	.069	.080	-.127	-.113	.191**	.664**	.480**	.406**	.357**	.375**
21. Between-Students Rel. (T2)	-.180**	-.189**	.101	-.029	-.193*	-.173**	.248**	.603**	.527**	.388**	.353**	.340**
22. Teacher-Student Rel. (T2)	-.126	-.149*	.047	.113	-.084	-.137*	.236**	.613**	.512**	.513**	.354**	.367**
23. Justice (T2)	-.085	-.065	.031	.188**	-.171	-.083	.196**	.382**	.198**	.242**	.439**	.323**
24. Educational (T2)	-.186**	-.09	.022	.172**	-.063	-.035	.166*	.454**	.303**	.292**	.304**	.462**
25. Global Anxiety (T3)	.601**	.115	-.065	.164*	-.019	.359**	-.355**	-.179**	-.181**	-.107	-.061	-.156*
26. Worries (T3)	.078	.471**	-.289**	.128	.08	.129	-.032	-.157*	-.156*	-.084	-.150*	-.011
27. Fears (T3)	.031	.072	.751**	.073	.092	.058	-.012	.040	.052	.059	-.054	.049
28. PS (T3)	-.285**	.042	-.111	.757**	.044	-.118	.085	.003	-.005	.066	-.008	.119
29. Academic Achievement (T3)	-.073	.123	-.078	.054	.757**	-.156	.070	-.047	.093	.021	.032	.176*
30. Victimization (T3)	.359**	.189**	-.062	.111	-.074	.585**	-.400**	-.258**	-.251**	-.168*	-.093	-.171*
31. Safety (T3)	-.367**	-.121	.114	-.082	-.005	-.463**	.516**	.320**	.309**	.164*	.179*	.258**
32. Bonding (T3)	-.243**	-.105	.09	.047	-.059	-.210**	.232**	.607**	.433**	.428**	.185**	.394**
33. Between-Students Rel. (T3)	-.187**	-.111	.062	-.007	-.018	-.183**	.236**	.496**	.624**	.520**	.213**	.351**
34. Teacher-Student Rel. (T3)	-.180*	-.088	.013	.113	.085	-.151*	.252**	.521**	.549**	.486**	.276**	.482**
35. Justice (T3)	-.126	.033	-.034	.142*	.145	-.049	.127	.370**	.246**	.235**	.372**	.448**
36. Educational (T3)	-.244**	-.029	-.032	.183*	.175	-.097	.180*	.467**	.429**	.409**	.298**	.611**

Note: \*  $p < .05$ ; \*\*  $p < .01$ ;  $\alpha$ : alpha coefficient of scale score reliability;  $\omega$ : omega coefficient of model-based composite reliability (identical across time waves due to the complete invariance of the measurement models); PS: Physiological Symptoms; T1: Time 1; T2: Time 2; T3: Time 3.



**Table S8 (Continued 1)**

	13	14	15	16	17	18	19	20	21	22	23	24
14. Worries (T2)	.058											
15. Fears (T2)	.006	-.040										
16. PS (T2)	.141*	.072	-.116									
17. Academic Achievement (T2)	.110	.051	.133	.176								
18. Victimization (T2)	.427**	.195**	-.037	.089	-.165							
19. Safety (T2)	-.402**	-.105	-.007	-.096	.148	-.638**						
20. Bonding (T2)	-.202**	-.159*	.016	.026	-.057	-.224**	.283**					
21. Between-Students Rel. (T2)	-.260**	-.092	.047	-.056	-.091	-.267**	.344**	.675**				
22. Teacher-Student Rel. (T2)	-.136*	-.099	.041	.036	-.048	-.213**	.225**	.709**	.747**			
23. Justice (T2)	-.072	.049	-.032	.070	-.130	-.140*	.241**	.513**	.555**	.585**		
24. Educational (T2)	-.166*	.006	.005	.095	-.039	-.160*	.255**	.684**	.660**	.747**	.752**	
25. Global Anxiety (T3)	.745**	-.076	-.244**	.268**	-.001	.361**	-.339**	-.204**	-.244**	-.198**	-.104	-.192**
26. Worries (T3)	.101	.631**	-.021	.354**	.162	.186**	-.138	-.161*	-.164*	-.144*	-.060	-.054
27. Fears (T3)	.058	-.232**	.903**	.019	.115	-.012	-.041	.019	.010	.006	-.027	-.002
28. PS (T3)	-.059	.157*	-.038	.766**	.060	-.100	.096	.073	.028	.131	.203**	.205**
29. Academic Achievement (T3)	.147	.081	.136	.183	.947**	-.136	.110	-.068	-.062	-.013	-.073	.001
30. Victimization (T3)	.364**	.162*	-.115	.178*	-.08	.633**	-.447**	-.289**	-.365**	-.328**	-.250**	-.288**
31. Safety (T3)	-.364**	-.209**	.157*	-.145	-.005	-.558**	.548**	.330**	.307**	.335**	.279**	.316**
32. Bonding (T3)	-.235**	-.062	.096	.079	.018	-.361**	.355**	.794**	.640**	.625**	.417**	.546**
33. Between-Students Rel. (T3)	-.228**	-.030	.065	.061	.031	-.309**	.313**	.510**	.753**	.595**	.368**	.542**
34. Teacher-Student Rel. (T3)	-.206**	.017	.041	.095	.132	-.297**	.327**	.606**	.578**	.691**	.375**	.566**
35. Justice (T3)	-.197**	.047	-.023	.146*	.169	-.217**	.265**	.415**	.252**	.330**	.516**	.520**
36. Educational (T3)	-.203**	.068	.018	.191**	.185*	-.276**	.317**	.548**	.408**	.467**	.469**	.714**

Note: \*  $p < .05$ ; \*\*  $p < .01$ ;  $\alpha$ : alpha coefficient of scale score reliability;  $\omega$ : omega coefficient of model-based composite reliability (identical across time waves due to the complete invariance of the measurement models); PS: Physiological Symptoms; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S8 (Continued 2)**

	25	26	27	28	29	30	31	32	33	34	35
26. Worries (T3)	.203**										
27. Fears (T3)	.015	-.052									
28. PS (T3)	.042	.118	.034								
29. Academic Achievement (T3)	.011	.206*	.109	.08							
30. Victimization (T3)	.534**	.224**	.004	.032	-.071						
31. Safety (T3)	-.479**	-.235**	.100	-.005	-.022	-.681**					
32. Bonding (T3)	-.253**	-.041	.057	.130	.042	-.320**	.384**				
33. Between-Students Rel. (T3)	-.215**	-.051	.031	.081	.074	-.309**	.289**	.631**			
34. Teacher-Student Rel. (T3)	-.232**	.009	.002	.167*	.191*	-.297**	.313**	.646**	.755**		
35. Justice (T3)	-.168*	.088	-.015	.163*	.226*	-.169*	.227**	.455**	.543**	.682**	
36. Educational (T3)	-.208**	.067	.018	.226**	.226*	-.263**	.328**	.617**	.663**	.808**	.823**

Note: \*  $p < .05$ ; \*\*  $p < .01$ ;  $\alpha$ : alpha coefficient of scale score reliability;  $\omega$ : omega coefficient of model-based composite reliability (identical across time waves due to the complete invariance of the measurement models); PS: Physiological Symptoms; T1: Time 1; T2: Time 2; T3: Time 3.

**Table S9***Goodness-of-Fit Results from the Longitudinal Tests of Measurement Invariance across Countries at Time 1*

Models	$\chi^2$	df	CFI	TLI	RMSEA (90% CI)	CM	$\Delta\chi^2$	$\Delta$ df	$\Delta$ CFI	$\Delta$ TLI	$\Delta$ RMSEA
<i>Global Anxiety</i>											
1. Configural	679.888*	498	.967	.954	.046 (.037, .054)	—	—	—	—	—	—
2. Weak	736.275*	590	.974	.969	.038 (.028, .046)	1	106.701*	92	+0.007	+0.015	-.008
3. Strong	842.957*	667	.968	.967	.039 (.030, .047)	2	121.400*	77	-.006	-.002	+0.001
4. Strict	866.989*	694	.969	.968	.038 (.029, .046)	3	40.562	27	+0.001	+0.001	-.001
5. Variance-covariance	834.435*	704	.977	.977	.032 (.022, .041)	4	21.061	10	+0.008	+0.009	-.006
6. Latent Means	988.926*	708	.949	.950	.048 (.041, .055)	5	45.852*	4	-.028	-.027	-.016
<i>Academic Achievement</i>											
1. Configural	30.318*	8	.998	.994	.142 (.090, .197)	—	—	—	—	—	—
2. Weak	36.078*	12	.997	.996	.120 (.076, .166)	7	6.836	4	-.001	+0.002	-.022
3. Strong	45.413	26	.998	.998	.073 (.035, .108)	8	15.507	14	+0.001	+0.002	-.047
4. Strict	50.154	31	.998	.999	.067 (.029, .100)	9	6.688	5	.000	+0.001	-.006
5. Correlated Uniquenesses	51.770	32	.998	.999	.067 (.030, .099)	10	1.944	1	.000	.000	.000
6. Variance-covariance	71.583*	33	.996	.998	.092 (.063, .121)	11	7.253*	1	-.002	-.001	+0.025
7. Latent Means	135.742*	34	.989	.994	.147 (.122, .173)	12	18.480*	1	-.007	-.004	+0.055
<i>Victimization and School Safety Climate</i>											
1. Configural	690.746*	376	.966	.962	.068 (.060, .076)	—	—	—	—	—	—
2. Weak	706.746*	395	.966	.964	.066 (.058, .074)	14	22.917	19	.000	+0.002	-.002
3. Strong	731.951*	468	.971	.974	.056 (.048, .063)	15	77.828	73	+0.005	+0.010	-.010
4. Strict	757.283*	489	.971	.975	.055 (.047, .063)	16	45.407*	21	.000	+0.001	-.001
5. Variance-covariance	659.191*	492	.982	.984	.043 (.034, .052)	17	4.491	3	+0.011	+0.009	-.012
6. Latent Means	759.543*	494	.971	.975	.054 (.047, .062)	18	20.055*	2	-.009	-.009	+0.011
<i>Other Facets of the School Climate</i>											
1. Configural	830.962*	492	.975	.962	.061 (.054, .069)	—	—	—	—	—	—
2. Weak	982.586*	607	.973	.966	.058 (.051, .065)	20	246.452*	115	-.002	+0.004	-.003
3. Strong	1005.062*	676	.976	.973	.052 (.045, .058)	21	78.848	69	+0.003	+0.007	-.006
4. Strict	1117.879*	704	.970	.968	.057 (.050, .063)	22	130.754*	28	-.006	-.005	+0.005
5. Correlated Uniquenesses	1125.249*	706	.969	.967	.057 (.051, .063)	23	11.998*	2	-.001	-.001	.000
6. Variance-covariance	1064.713*	721	.975	.974	.051 (.044, .057)	24	73.751*	15	+0.006	+0.007	-.006
7. Latent Means	1335.391*	726	.956	.954	.068 (.062, .073)	25	119.852	5	-.019	-.020	+0.017

Note. \* $p < .01$ ;  $\chi^2$ : 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;  $\Delta$ : Change in model fit relative to the comparison model.