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ORIGINAL PAPER

Beyond School Engagement: School Adaptation and Its Role in Bolstering Resilience Among Youth Who Have Been Involved with Child Welfare Services

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Abstract

Background School adaptation is a critical risk or resilience factor for at-risk youth.

Objective The overall aim was to improve our conceptualization of school adaptation as a risk or resilience factor for youth in contact with the child welfare system. We hypothesized that school adaptation includes a range of indicators that would distinguish youth into meaningful groups, that group membership is related to known risk factors, and that school adaptation groups predicts mental health functioning.

Methods Participants included 2668 youth in contact with the child welfare system following an investigation for alleged maltreatment. Youth, teachers, caregivers, and caseworkers provided relevant information. Patterns among school adaptation indicators were determined via latent profile analysis, relationships between latent profiles and child welfare risk factors were determined using multinomial logistic regression, and relationships between profiles and later mental health were explored using hierarchal linear regression.

Results Latent profile analysis supported the interpretation of four profiles of school adaptation, including a high overall adaptation group, a moderate overall adaptation with somewhat poor behavior group, a low overall adaptation with poor behavior group, and a low overall adaptation with good behavior and low emotional/cognitive engagement group. School adaptation profiles were related to some demographic variables but were largely independent of child welfare indicators. Maltreatment severity predicted profile membership overall, but differences between groups were not significant. Maltreatment severity and profile membership predicted youth mental health functioning 3 years later.

Conclusions For youth involved with child welfare services, profiles of school adaptation appear to be better predictors of mental health outcomes than type, substantiation, or severity of maltreatment, demonstrating the important protective role of school in the lives of at-risk youth.

Keywords Child welfare · School engagement · School adaptation · Mental health · Child abuse and neglect

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Approximately 685,000 children in the U.S. come into contact with the child welfare system due to concerns about child maltreatment each year (USDHHS 2013). Of the children in contact with child welfare, 78.3% were victims of neglect, 18.3% were physically abused, and 9.3% were sexually abused (USDHHS 2013). Additionally, the majority of children with substantiated cases experience multiple types of abuse over an extended period of time.

Children involved with child welfare services are at high risk of developing internalizing and externalizing problems (Kessler et al. 2010; Moylan et al. 2010). In fact, close to half (47.9%) of youth in the National Survey of Child and Adolescent Well-Being (NSCAW) experienced clinically significant symptoms of behavioral and emotional problems (Burns et al. 2004). Research has demonstrated that the impact of maltreatment is associated with impaired attachment, deficits in affect and behavioral regulation, dissociation, and impairments in cognition and self-concept (Cook et al. 2005). The negative effects of childhood maltreatment are not isolated to childhood and have demonstrated the potential to negatively impact mental health functioning well into adulthood. Youth who experience maltreatment are at increased risk of future exposure to trauma and lifelong mental health difficulties (Cook et al. 2005; Lereya et al. 2015).

The negative impact of childhood maltreatment has been demonstrated in another important domain of youth adaptation: school functioning (Maguire et al. 2015). Children who have experienced maltreatment do worse than their non-maltreated peers on a variety of school outcomes including grades (Leiter and Johnsen 1994), absenteeism rates (Hagborg et al. 2018), test scores, grade retention, and special education status (Ryan et al. 2018). Children who have experienced maltreatment have also been shown to have more school suspensions (Bell et al. 2018) and more disciplinary referrals (Kendall-Tackett and Eckenrode 1996). Clearly, maltreatment has the potential to negatively impact multiple levels of adaptation within the school context, but the full impact, mechanisms, and pathways of the relationship between maltreatment and impaired school adaptation are not fully understood.

Resilience and the Importance of School

Resilience refers to positive adaptation in the context of significant adversity (Luthar 2006). In over 40 years of studying resilience, several factors have repeatedly emerged as protective for youth exposed to adversity, including relationships with supportive adults and effective schools (Luthar et al. 2000). For example, a wealth of literature has demonstrated that parenting practices and supportive relationships with parents, are associated with increased resilience among youth (Masten 2014; Murray Nettles et al. 2000). What about youth who do not have the benefit of a supportive caregiver relationship and have experienced maltreatment perpetrated by a caregiver? For youth who do not have the benefit of a safe, supportive, and secure attachment at home, perhaps those protective effects can be conferred from the school environment.

The classroom and the school may be the optimal environments in which to support resilience among high-risk youth (Morrison and Allen 2007). In a review of studies examining resilient youth who have developed into competent adults, despite a host of risk factors, Benard (1995) argues that protective factors can be grouped into three major categories: caring and supportive relationships, positive and high expectations, and opportunities for meaningful participation. Schools have the potential to contribute to all three. A

supportive relationship may take the form of a teacher or another school staff member who expresses interest in a child's life. The classroom is a potential setting for communicating high expectations for behavior and academics and providing scaffolded supports to meet those expectations. Classrooms and schools can provide opportunities for youth to develop other skills which bolster resilience, such as problem-solving and social skills.

Gilligan (2000) argued that for youth whose home life does not provide a secure base of attachment, other avenues for achieving a secure base, such as the educational or recreational context, may be a viable alternative. He argues that consistent classroom environments and warm relationships with teachers may confer more benefit than therapeutic intervention, including a sense of stability and security. Gilligan (2000) went on to argue that a sense of belonging in school can promote positive adaptation of vulnerable youth across domains including academic performance, motivation, emotional well-being, risk-taking behavior, and response to trauma.

The role of various aspects of the school experience, ranging from behavioral competence (Kremer et al. 2016), attendance (Morrissey et al. 2014), academic achievement (Diseth et al. 2012), relationships with teachers (Murray Nettles et al. 2000; Roorda et al. 2017) and peers (Bond et al. 2007) and self-rated school engagement (Upadyaya and Salmela-Aro 2013), have been shown to be important for children in the general population. Limited research exists concerning which individual indicators are most important in the lives of youth involved with child welfare services and how those factors impact outcomes other than academic achievement.

Limitations of the School Engagement/Adaptation Literature

While the importance of school adaptation is clear, the current state of the research has several ongoing debates and leaves many unanswered questions. First, given the many aspects of school adaptation and the multiple ways in which school adaptation can be conceptualized (as a predictor, index of functioning, outcome, et cetera), much remains to be determined regarding what dimensions comprise school adaptation and how to measure them. Most importantly, previous conceptualizations of school adaptation are not comprehensive and ignore potentially meaningful indicators of school adaptation. Second, there are limited studies on what school adaptation looks like for at-risk youth and how it relates to important risk factors. Third, even more limited is the research on how school adaptation is related to youth mental health.

The literature conceptualizes student engagement as a multifaceted construct that is an important factor for predicting youth outcomes and adjustment. Fredricks et al. (2004) reviewed the literature on school engagement, including definitions, measures, precursors, and outcomes of engagement. School engagement is usually described as including three dimensions: behavioral engagement, emotional or affective engagement, and cognitive engagement (Fredricks et al. 2004; Jimerson et al. 2003). Behavioral engagement typically covers aspects of school engagement such as following or breaking of rules, demonstrating persistence or effort, asking questions, participation in class discussions, or involvement in activities like after school sports or student government. Emotional engagement typically includes attitudes and affective responses towards school, such as feeling bored, happy, sad, or anxious in the classroom, feelings towards educators and peers, and identifying with the school. The final component of school engagement, cognitive engagement, includes motivation and investment in learning as demonstrated by self-regulation, being strategic, and preferences for challenging

work. While this framework is the most common, there are many different frameworks, names, and definitions for school adaptation. Appleton et al. (2008) echo the findings and concerns noted by previous reviews that the research on school engagement has been hindered by the lack of consensus regarding what the construct is and the lack of psychometrically sound measures of the dimensions of the construct.

Another important limitation of the school engagement literature concerns the measurement of the construct. The tools that currently exist rely heavily on student reports and perceptions. Student report, while an important component of school adaptation, is one of many possible indicators that may demonstrate overall school adaptation. Of the measures reviewed by Libbey (2004), only one included teacher perceptions. Libbey's review also showed that of the over 20 studies reviewed, only one measure of student engagement had over 20 items, with most measures only utilizing 2–15 items.

We argue that the historical difficulty of defining and measuring the construct of school adaptation reflects the fact that school adaptation is a multidimensional construct, consisting of interrelated dimensions that may also make unique contributions to adaptation. School engagement, as it is described by previous investigators, does not capture the totality of school adaptation. The extant literature does not include all of the potentially meaningful dimensions of school adaptation, other aspects of school adaptation may need to be considered, and additional work is needed to discern how all the indicators of school adaptation fit together and tease apart which dimensions of school adaptation are important for specific outcomes.

A second area which warrants further investigation is what school adaptation looks like among the population of children who are most at risk, including youth investigated by child welfare services for alleged maltreatment. It is foreseeable that school adaptation may differ considerably by important child-level predictors such as race, gender, age, history of placement in out-of-home care, type of maltreatment experienced by the youth, and severity of maltreatment.

Perhaps the single largest gap in the research regarding school adaptation is its relationship to mental health. In a longitudinal study of 2022 twelve to fourteen year-old students, examining school connectedness and mental health, Shochet et al. (2006) found that not only were school connectedness and mental health symptoms correlated at both time points, but that school connectedness predicted depressive symptoms at time two. Using a diverse sample of 1025 adolescents and the three-dimensional conceptualization of student engagement, Wang and Peck (2013) identified five profiles of student engagement, including highly engaged, moderately engaged, minimally engaged, emotionally disengaged, and cognitively disengaged. These various profiles differed in their educational and mental health functioning, demonstrating the potential impact of school engagement on mental health or vice versa. Specifically, emotionally disengaged and minimally engaged teens reported higher rates of depression than those who were moderately engaged or cognitively disengaged, while the highly engaged group reported the lowest rates of depression. More research about the relationship between school adaptation and mental health is needed.

School Adaptation Among Maltreated Youth

Overall, the extant literature has revealed that school adaptation of children and adolescents in this high-risk group is largely reduced when compared to their peers who have not experienced maltreatment (Kaplan et al. 1999). For example, children involved with social services due to abuse and neglect demonstrate lower grades, test scores, and attendance when

compared to children from the general school population (Leiter and Johnsen 1994; Ryan et al. 2018). Experiences of abuse and neglect have been associated with poor academic test performance (Eckenrode et al. 1993; Ryan et al. 2018) and severe academic delays when compared to their non-abused peers, even when controlling for socio-economic status (Jonson-Reid et al. 2004; Wodarski et al. 1990).

Characteristics of the maltreatment experienced have also demonstrated importance with regard to school adaptation, though findings are mixed. In a study examining the impact of maltreatment severity on academic outcomes between adolescent siblings (to control for effects of family background and neighborhood), Slade and Wissow (2007) found that maltreatment intensity was significantly associated with lower grade point average and increased problems completing homework assignments. In a study including 490 youth in foster care, McGuire and Jackson (2018) found that frequency of maltreatment is more predictive of academic behavior than severity or type of maltreatment experienced, but no dimensions of maltreatment were associated with grades. Coohey et al. (2011) completed a three year longitudinal study involving 702 maltreated children examining dimensions of maltreatment as risk factors for academic outcomes. Regarding math scores, multivariate analyses showed that chronic maltreatment was a risk factor for poorer achievement, but severity of maltreatment was not a significant predictor. Similarly, regarding reading scores, multivariate analyses highlighted type of maltreatment and exposure to domestic violence as predictors of achievement, but placement in out of home care, chronic maltreatment, and severity of maltreatment did not reach significance. Dimensions of sexual abuse experienced by children, including duration of the abuse, exposure to other forms of victimization, and symptoms of dissociation have demonstrated negative academic, cognitive, and social functioning impacts in the longer term (Daignault and Hébert 2008). In a large study of 11,835 s grade students, Fantuzzo et al. (2011) controlled for demographics and other risk variables and found that children who had experienced neglect experienced worse academic outcomes than those who had experienced physical abuse. Other researchers have corroborated the findings that abuse and neglect are both detrimental to academic outcomes, but the impact of neglect is over and above that of abuse (Romano et al. 2015).

Youth who have experienced adverse childhood experiences also display lower rates of school engagement, but resilience in the face of childhood adversity is associated with increased school engagement (Bethell et al. 2014). With regard to dimensions of school engagement, Pears et al. (2013) found that children who had experienced maltreatment and were living in foster care had lower cognitive and affective school engagement than non-maltreated, low-income comparison groups and that affective and cognitive engagement mediated the association between maltreatment and academic competence. Research has demonstrated the importance of school engagement among this high-risk sample in that even among maltreated children, greater school engagement is related to higher levels of well-being and reduced likelihood of delinquency (Tyler et al. 2008).

Using data from NSCAW, Leonard et al. (2016) examined the main effects of self-reported school engagement on youth outcomes in a sample of children and adolescents involved with the child welfare system. School engagement, averaged across a three-year period, significantly and positively predicted later academic achievement in both reading and math, as well as negatively predicting internalizing and externalizing symptoms, even when controlling for initial levels of academic achievement or mental health symptoms, race, gender, maltreatment type that led to the investigation, number of out of home placements, and cognitive functioning. While this study was an important step to understanding the relationship between school factors and mental health for youth involved with the child welfare system, it was limited by the use of a single indicator of school adaptation.

Classroom behavior is another important indicator of school adaptation in which maltreated youth demonstrate impairment (Kerr et al. 2000). Maltreated youth are significantly more likely than their non-maltreated peers to have disciplinary problems and school suspensions (Maguire et al. 2015). Teachers report that maltreatment results in increased difficulties with inattention and disruptive behaviors in the classroom (Gamache Martin et al. 2010). In a review of the literature, increased teacher report of classroom behavioral problems is common for children that have experienced maltreatment (Romano et al. 2015).

Children and adolescents who have experienced maltreatment also exhibit impairment across a host of other indicators related to school adaptation compared to non-maltreated peers. Studies have repeatedly found that maltreated youth have poorer attendance rates than the general school population (Hagborg et al. 2018; Kiesel et al. 2016), with some research finding that the negative impact of maltreatment is worse for absenteeism than for grades (Leiter 2007), possibly in an attempt to conceal maltreatment (Kearney 2008). Maltreated youth are also less likely than non-maltreated peers to have strong relationships with their teachers (Lynch and Cicchetti 1992) and with their peers (Benedini et al. 2016; Staudt 2001). Clearly, maltreated youth are at risk for failure in the school context across a variety of dimensions, but this is an area which requires further investigation.

The extant research leaves several areas of school adaptation that need further exploration. First, we are not aware of any studies that have explored potential profiles and dimensions of school adaptation utilizing student report, teacher report, caregiver report, school records, as well as reports from other professionals, such as caseworkers, or profiles that encapsulate more than the theorized three-dimensions of school adaptation. School engagement, as described above, does not adequately address school adaptation. We argue that school engagement is one component of a child's adaptation in school, but is not as comprehensive, does not necessarily take into account the perspectives of multiple important stakeholders, and artificially combines aspects of school adaptation that may be uniquely important. While school engagement is viewed as a single construct, we approach school adaptation as encapsulating a broader picture of youth's success in school. School adaptation includes a constellation of potentially important indicators. By taking a higher-level approach to school adaptation, we hope to gain a better understanding of the experiences of youth in school, the challenges they face, the successes they experience, what that means for their overall adaptation, and how to support their optimal development. Second, the extant research has not explored profiles of student adaptation among youth who are involved with the child welfare system, potentially missing a population in which a strong connection to school is of the utmost importance. Third, there is a dearth of research exploring the association between school adaptation and youth mental health, thus ignoring an important dimension of youth wellbeing and adaptation.

The Current Study

The literature to date has mostly focused on school factors as outcomes that demonstrate youth resilience and level of risk. In contrast, very little research has explored how the connection to school impacts the known relationships between adversity and youth outcomes. This project sought to shed light on the role of schools in conferring risk or resilience for youth in contact with the child welfare system, with regard to their mental health. The overall aims of this study are to (1) improve our conceptualization of school adaptation, with particular attention to individual variation along multiple dimensions of school adaptation,

(2) examine the relationship of school adaptation to important child welfare indicators, and (3) explore the impact of school adaptation on youth mental health.

Aim 1: Identification of Profiles of School Adaptation Among Youth Involved with Child Welfare Services

The first aim of this study was to examine the school adaptation of children and adolescents in a comprehensive, holistic, and nuanced way that takes into account a variety of factors related to the school context. Previous research has largely relied on a single indicator of well-being at school, such as academic achievement as assessed by performance measures, grade point average from school records, completion of milestones like graduation, or school engagement as reported by youth. Other research has combined multiple, potentially meaningful components of school adaptation into a single measurement, or into two, three or four-dimensional models of school adaptation. By doing so, meaningful specificity regarding components of school adaptation may be lost. We hoped to "unscramble the eggs" (Oberski 2016) of school adaptation and gain back the specificity that is lost in composite variables, while maintaining the breadth of school indicators that is lost by using single indicators.

We are not aware of any research that has examined school adaptation, specifically among youth involved with child welfare services, in this comprehensive way. In this study, we utilized the constellations of indicators of school adaptation to understand the varied representations of school adaptation for youth who are involved with child welfare services. It is easy to imagine a student who is on grade level in reading and math but may not feel connected to school or may be experiencing behavioral difficulties. It is also feasible to imagine a child who loves school and feels connected to peers and teachers, but has poor attendance rates, test scores, and grades, because of outside factors beyond their control. We hoped to discover the hidden groups reflected by these variables and determine if common profiles exist among the multiple ways of measuring success and connection in the school context. We predicted that a positive profile of school adaptation, which has the potential to protect youth from some of the negative impacts of life stressors, includes aspects of teacher perception, student behavior, cognitive appraisal, demonstrable academic achievement, and feelings of belonging and self-efficacy. We predicted that profiles of school adaptation would be more complicated than simply universally high, moderate, and low adaptation, and that a range of indicators would distinguish these groups.

Aim 2: Predictors of School Adaptation Profiles Among Youth Involved with Child Welfare Services

A second aim of this study was to discern factors that predict school adaptation profiles. While extant research has explored the associations between individual indicators of school adaptation and risk factors, such as elevated absenteeism rates for children living with neglectful caregivers, there is limited understanding of the relationship between identified risk factors and the broader picture of school adaptation. We predicted that profiles of school adaptation would vary by demographic and child welfare specific differences including youth race/ethnicity, gender, age, alleged type of maltreatment experienced by the youth, substantiation of the maltreatment, and severity of maltreatment experienced. Specifically, our predictions aligned with the existing literature that poorer school adaptation would be associated with older age (Janosz et al. 2008), male gender (Appleton et al. 2008; Furrer and Skinner 2003), racial/

ethnic minority status (Johnson et al. 2001), and experience of neglect (Oh and Song 2018). While the research on dimensions of maltreatment and school outcomes are mixed, we predicted that poorer school outcomes would be associated with substantiation of maltreatment and more severe maltreatment.

Aim 3: Examining the Role of School Adaptation in Buffering the Effects of Child Welfare Indicators of Maltreatment on Mental Health Outcomes

A wealth of research has demonstrated poorer mental health outcomes of youth involved in child welfare services and the negative impacts of experiencing maltreatment on mental health functioning. The third aim of this project was to explore the role of school adaptation in the relationship between child welfare indicators of maltreatment and mental health outcomes for youth involved with child welfare services. We predicted that youth who demonstrate positive school adaptation would demonstrate more resilience in the face of substantiated maltreatment and more severe maltreatment, with regard to their mental health. We predicted that youth who have low levels of school adaptation would be at greater risk of succumbing to the effects of maltreatment and experience poorer mental health. An important purpose of this study was to understand the relative contributions to mental health made by school adaptation versus aspects of child welfare involvement. We predicted that school adaptation would independently explain youth mental health, even when taking child welfare indicators into account. We also predicted that school adaptation would buffer the impact of maltreatment on youth mental health functioning. Specifically, we hypothesized that maltreatment severity would have a more substantial impact on mental health functioning long-term in the context of suboptimal school adaptation, as these youth do not benefit from this layer of protection. We also hypothesized that for youth who experience the benefits of a strong connection to school and the resilience conferred by a more positive profile of school adaptation, the relative impact of child welfare indicators of maltreatment on mental health would be reduced.

Method

Participants

The first National Survey of Child and Adolescent Well-Being (NSCAW-I) is a longitudinal study that followed a cohort of 5501 infants, children, and adolescents who were the subjects of investigations by child welfare services during a 15-month period starting in October of 1999. Children between the ages of zero and 14 years of age, at the initial wave of data collection, were recruited from 97 counties across the United States to create a national probability sample. The sample used in the current study is described in the Missing Data Analyses and Descriptive Statistics and Preliminary Analyses sections.

Measures

Caseworker Measures

Demographics

Demographic information regarding youth age, gender, and race or ethnicity utilized derived variables from NSCAW which incorporated reports from two or more respondents including youth, caregivers, and caseworkers.

Maltreatment Classification Scale

Child welfare service caseworkers completed a modified version of the Maltreatment Classification Scale (MCS; Manly et al. 1994) which was used to assess multiple components of the alleged maltreatment experienced by the youth. The MCS is a commonly used scale in the literature and has consistently demonstrated good reliability and validity (Manly et al. 1994).

Alleged Type of Maltreatment Leading to Investigation

The MCS was used to identify forms of maltreatment allegedly experienced by youth which resulted in the investigation by child welfare services. Previous studies have reported that the MCS demonstrates interrater reliability for different maltreatment subtypes of .89 to .98 (Price and Glad 2003). For youth in which multiple forms of alleged abuse or neglect were reported, caseworkers were asked to rate which form of maltreatment was most severe. For the purposes of this study, categories of alleged abuse or neglect were collapsed into investigations involving physical abuse, sexual abuse, emotional abuse, neglect (including not providing, failing to supervise, and abandonment), or "other' (including moral or legal maltreatment, educational maltreatment, exploitation, and other unspecified forms of maltreatment).

Substantiation of Maltreatment

Derived variables from NSCAW, which compiled child welfare service caseworker reports on the outcome of the investigation, were used to distinguish alleged experiences of maltreatment that were deemed as *substantiated* or *other than substantiated* (including allegations that were *neither substantiated or indicated*, and *unfounded or ruled out*).

Severity of Maltreatment or Level of Harm to Child

Child welfare service caseworkers were asked, "Regardless of the outcome of the investigation, how would you describe the level of harm to the child? Would you say…?"

Caseworkers were asked to choose one of four responses including *none, mild, moderate,* or *severe.*

Caregiver Measures

Child Behavior Checklist

Youth mental health was measured using the Child Behavior Checklist (CBCL) from the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach and Rescorla 2001). The CBCL was normed on a U.S. nationally representative sample of 2368 youth, has demonstrated very good reliability and validity (Achenbach and Rescorla 2001), and has been used in thousands of studies. Specifically, the CBLC has demonstrated an average test-retest reliability of $r=0.88$, an average internal consistency of $r=0.8$, and an average inter-rater reliability of $r=0.73$. It has demonstrated convergent validity, discriminant validity, and predictive validity, with a sensitivity rate score of 0.92 and a specificity rate score of 0.82. This measure contains 113 items in which participants respond to how often behaviors are true for them using a Likert scale (0 = *not true,* 1 = *sometimes true,* 2 = *often true).* The CBCL was completed by available caregivers at Waves 1, 3, and 4 of data collection. The current study utilized standardized T-scores of the Total Problems Score. Cronbach's Alpha for the total problem scale between Wave 1 and 4 was .71 for the current sample. This scale was chosen as a general measure of youth mental health because it covers a wide range of mental health domains including withdrawal/depression, anxiety/depression, somatic complaints, social problems, thought problems, attention problems, rule breaking behavior, and aggressive behavior.

Teacher Measures

Social Skills Rating System

The Cooperation scale from the Social Skills Rating System (SSRS; Gresham and Elliott 1990) Teacher Form was used to assess teacher rated classroom behavior. Teachers were asked to rate the student's behavior regarding use of classroom time, completion of assignments, following of directions, ignoring of peer distractions, and other behaviors reflecting in-class behavioral functioning. The SSRS has been shown to be a psychometrically sound instrument (Benes 1995) and provides standard scores normed on a national sample of over 4000 youth. Alpha coefficients for the cooperation scale were .92 for the child version and .93 for the adolescent version within this sample.

Teacher-Rated Student Behavior Problems

Teachers were asked, "In this school year, has the student had any behavior or discipline problems at this school which resulted in the student's parents being sent a note or being asked to come in and talk with the teacher or principal?" and asked to respond *Yes, No,* or *Don't know*. If they responded *Yes*, then teachers were asked the follow up question, "Has this happened just once or more than once?" and asked to respond *Once, More than once,* or *Don't know*.

Attendance

Teachers were asked to report how many school days were missed by the student in the academic school year

Teacher Report Form

Teacher rated academic achievement was measured using components of the Teacher Report Form (TRF) from the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach and Rescorla 2001). Teacher reports of academic achievement were averaged to create a composite rating of teacher rated academic achievement. Overall, psychometric properties for this measure are considered very good (ASEBA; Achenbach and Rescorla 2001). Alpha coefficients for this variable within this sample ranged from .81 to .94, depending on the number of subjects rated by the teacher.

Youth Measures

Woodcock–Johnson Mini-Battery of Achievement

Academic achievement was measured using the Woodcock–Johnson Mini-Battery of Achievement (MBA; Woodcock et al. 1994). The MBA can be administered in 20–30 min, was completed at Waves 1, 3, and 4 of data collection, and provides standardized scores of achievement ($M = 100$, $SD = 15$) in both reading and math. The reading and math scores were averaged to create a single indicator of academic achievement. Cronbach's Alpha for the reading and math scores was .81 for the current sample. The MBA has demonstrated concurrent validity with other instruments used to measure academic achievement and has been shown to have good internal consistency and test-retest reliability (Woodcock et al. 1994).

School Engagement Questionnaire from the Drug-Free Schools and Communities Act Survey

Participants in NSCAW from 6 years of age and older completed a measure of student engagement from the *Drug-Free Schools and Communities Act Survey* (Dowd et al. 2004). This measure included 11 items assessing youth's feelings about school, perceived ability to succeed in school, and behavioral measures of engagement. Youth rated each item as *Never*, *Sometimes*, *Often*, or *Almost Always*. Items with a negative valence were reverse scored, and raw scores were converted into Z-scores to be used in subsequent analyses. Limited information is available regarding the psychometric properties of this measure, but it is commonly used to assess aspects of student reported school engagement (Bender 2012; Leonard and Gudiño 2016), and has demonstrated acceptable reliability (Tyler et al. 2008) and convergent validity with measures of academic achievement (Leonard et al. 2016). Preliminary analysis, including bivariate correlations and exploratory latent profile analyses revealed that school engagement item number 4 ("How often do you find the schoolwork too hard to understand?") and school engagement item 6 ("How often do you fail to complete or turn in your assignments?") did not correlate with other indicators as expected and did not distinguish latent profiles of school functioning. These items were conceptually redundant with other indicators and added unnecessary noise to the model, thus they

were excluded from the primary analyses. Remaining items included student reports on student–teacher relationships, peer relationships, emotional engagement (including frequency of enjoying school and hating school), behavioral engagement (including frequency of trying their best, getting sent to the office or staying after school for misbehavior, listening carefully or paying attention, and getting homework done), and cognitive engagement (including frequency of finding classes interesting). While the 9 items used were entered into the latent profile analysis separately, the alpha coefficient between these items was .73 within this sample.

Procedure

Wave 1 of data collection was completed within 2–6 months of the completion of the investigation by child welfare services. Wave 3 was completed at 18 months after the investigation, and Wave 4 was completed at 36 months after the investigation. Approval for all NSCAW procedures was obtained from the Research Triangle Institute's Institutional Review Board (IRB). The current study utilized data from interviews with youth, caseworkers, and caregivers. Consent for participation of youth was obtained from the person with the legal authority to do so, and youth participants provided assent. Caregivers and caseworkers consented for their own participation. The secondary analysis of this data, for the purposes of the current study, was approved by the University of Denver IRB.

Data Analysis

Complex Survey Design

NSCAW utilized a two-stage stratified design which intentionally over sampled for infants, sexual abuse cases, and cases receiving ongoing services after investigation. A two-stage stratified design allowed for over sampling using first stage strata and second stage domains. Sampling weights were used to yield national estimates for the population of children involved with child welfare services. Analyses were conducted using SPSS Complex Samples, Version 22 (IBM 2013), and MPlus (Version 6; Muthén and Muthén 2010) to account for the complex survey design of NSCAW.

Preliminary Analyses

First, descriptive statistics, including ranges, means, and standard deviations, were calculated for all control and outcome variables. Next, bivariate correlations (see Table 1) and analyses of variance (ANOVAs) were completed to assess potential relations between variables to be included in the latent profile analysis. Missing data analyses were conducted to determine if specific variables predicted overrepresentation of missing data.

Aim 1: Identification of Profiles of School Adaptation Among Youth Involved with Child Welfare Services

Latent profile analysis was used to categorize youth into profiles of school adaptation. This analysis included indicators at Wave 1, including student-rated emotional engagement,

Table 1 Bivariate correlations of school adaptation indicators

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. S—Enjoy school	–												
2. S—Hate school	−.46**	–											
3. S – Try your best on work	.21**	−.13**	–										
4. S—Find classes interesting	.30**	−.21**	.14**	–									
5. S—Sent to office	−.14**	.18**	−.18**	−.12**	–								
6. S—Get along w/teachers	.32**	−.23**	.28**	.27**	−.28**	–							
7. S—Pay attention	.25**	−.17**	.37**	.22**	−.27**	.34**	–						
8. S—Complete homework	.24**	−.15**	.33**	.19**	−.23**	.29**	.34**	–					
9. S—Get along w/other students	.20**	−.13**	.19**	.19**	−.16**	.28**	.23**	.20**	–				
10. S—Woodcock Johnson scores	.00	−.04	.11**	.01	−.11**	.11**	.13**	.13**	.13**	–			
11. T—Academic performance	.11**	−.13**	.19**	.04	−.16**	.17**	.21**	.25**	.08**	.52**	–		
12. T—SSRS classroom behavior	.17**	−.12**	.18**	.07*	−.26**	.21**	.19**	.26**	.15**	.24**	.51**	–	
13. T—Contact parents behavior	−.16**	.09**	−.08**	−.07*	.32**	−.23**	−.15**	−.11**	−.09**	−.17**	−.23**	−.46**	–
14. T—Days absent	−.16**	.18**	−.07*	−.06	.09*	−.08*	.01	−.07*	−.03	−.08*	−.19**	−.14**	.17**

N ranges from 795 to 2490, depending on available data. S indicates student rated and completed variables. T indicates teacher rated variables. ** < 0.01, * < 0.05

behavioral engagement, cognitive engagement, peer relationships, and student–teacher relationships; academic achievement as measured by performance assessments; and teacher-rated academic competence, classroom behavior, frequency of parent contact regarding student behavior problems, and attendance. All variables were converted to Z-scores ($M = 0$, $SD = 1$) before being entered into the latent profile analysis. Good model fit was determined by lower values on the Akaike Information Criterion (AIC; Akaike 1987), Bayesian Information Criterion (BIC; Schwartz 1978), and Sample Size Adjusted Bayesian Information Criterion (SABIC; Sclove 1987), as well as improvement of the models over the previous model as indicated by a statistically significant Lo–Mendell–Rubin Likelihood Ratio Test (LMR-LRT; Lo et al. 2001).

Aim 2: Predictors of School Adaptation Profiles Among Youth Involved with Child Welfare Services

We predicted that known risk factors for poor mental health and academic outcomes (such as alleged type of maltreatment, substation of maltreatment, caseworker rated severity of maltreatment, race or ethnicity, gender, and age) at Wave 1 would be related to poorer initial school adaptation. This hypothesis was evaluated using multinomial logistic regression analysis.

Aim 3: Examining the Role of School Adaptation in Buffering the Effects of Child Welfare Indicators of Maltreatment on Mental Health Outcomes

We predicted that latent profiles of school adaptation would significantly predict later mental health symptomology and moderate the relation between child welfare indicators of maltreatment and mental health. A hierarchical regression analysis was conducted to test for main effects of school adaptation profiles on mental health at Wave 4, after controlling for mental health at Wave 1. To test for moderation effects, interaction terms of school adaptation profiles and maltreatment severity were generated and used to predict mental health symptomology. Step 1 of the model included mental health symptomology at Wave 1, race or ethnicity, substantiation of maltreatment, alleged type of maltreatment experienced, and caseworker rated severity of maltreatment. The White racial group and the Neglect alleged type of maltreatment group were used as reference groups, given that these were the largest groups in the sample. School adaptation profile membership was added in Step 2 of the model, and interaction terms of school adaptation profile membership dummy codes with caseworker rated severity of maltreatment were added in Step 3 of the model.

Results

Missing Data Analyses

The sample size included in each analysis varied by aim. Of the 5501 youth in NSCAW, 2668 youth had at least partial data for the school adaptation latent profile analysis in Aim 1. Of the 2833 youth excluded from Aim 1, 2571 (90.8%) were excluded due to being too young. Only 262 youth (4.8% of the total sample) were excluded due to missing data. Of these 2668 youth included in the latent profile analysis, 90.7% (n = 2421) had data for 7 or more of the 14 variables included in the analysis. Of these 2668 youth,

2425 had data needed for the multinomial logistic regression in Aim 2, and 1987 youth had all data needed for the regression analyses in Aim 3. Of the sample included in the latent profile analysis, only 243 youth (9.1%) were excluded from Aim 2 due to missing data. Of the sample included in the latent profile analysis, 681 youth (25.5%) were excluded from Aim 3 due to missing data, likely due in large part to retention rates at Wave 4.

Given the larger proportion of excluded youth for missing data for Aim 3, missing data analyses were completed comparing the 681 youth excluded from aim 3 for missing data and the other 1987 included in all 3 aims of data analysis. T-tests revealed that youth with missing data were older ($M = 10.15$, $SD = 3.01$ vs. $M = 9.89$, $SD = 2.84$, $p = .001$) and were rated as experiencing less severe maltreatment by caseworkers ($M = 2.35$, $SD = .97$ vs. $M = 2.39$, $SD = 1.03$, $p = .023$). Significant differences in rates of exclusion were found by race ($\chi^2 = 34.56$, $p < .001$). Data were missing at a significantly higher rate for the "other" racial group compared to the overall sample (35.4% vs. 24.9%, $p < .001$) and at a significantly lower rate for the white racial group compared to the overall sample (22.1% vs. 24.9%, $p = .005$). There were no significant differences between those included in all three aims versus those excluded from aim 3 with regards to gender, school adaptation profile membership, or alleged type of maltreatment experienced.

Descriptive Statistics and Preliminary Analyses

Overall, this sample was diverse in terms of age (min. = 4, max. = 16, $M = 9.96$, $SE = .06$), gender (52.8% female, 47.2% male), and race or ethnicity (45.7% White, 29.6% Black, 16.5% Hispanic, and 7.9% other). The sample also varied in terms of alleged type of maltreatment that led to the investigation by child welfare services (25.7% physical, 18.0% sexual, 7.7% emotional, 41.8% neglect, and 6.8% other), substantiation of maltreatment (60.2% substantiated, 39.8% other than substantiated), and the caseworker reported severity of maltreatment experienced by the youth (24.2% none, 29.0% mild, 31.1% moderate, and 15.7% severe). This sample also varied widely with regards to all indicators of school adaptation. Of note, this sample had missed an average of 10.51 days ($SD = 13.97$) of school during the academic year, demonstrating a considerable amount of missed school and had mean WJ scores about one half standard deviation below the population mean, as well as considerable variability ($M = 93.15$, $SD = 20.22$). On average, teachers rated this sample as "Somewhat below grade" to "At grade level" with regards to academic functioning. Regarding mental health, average caregiver ratings of combined internalizing and externalizing symptomology was somewhat elevated compared to population samples, with 27.62% of the sample falling in the "at-risk" range for mental health problems and 22.99% falling in the clinically significant range at Wave 1, as well as 26.10% of the sample falling in the "at-risk" range for mental health problems and 18.16% falling in the clinically significant range at Wave 4.

As expected, there were many significant correlations between indicators of school adaptation ranging from .05 to .50 ($p < .05$). Bivariate correlations for indicators of school adaptation are displayed in Table 1. Given that most bivariate correlations between the 14 indicators of school adaptation ranged from weak to moderate, and the indicators were conceptually distinct and meaningful, the decision was made to include each of the 14 indicators in the latent profile analysis as separate variables, and not combine or average indicators.

Aim 1: Identification of Profiles of School Adaptation Among Youth Involved with Child Welfare Services

Determining Profiles

Fourteen indicators of school adaptation (as displayed in Table 1) at Wave 1 were included in the latent profile models, including nine items from the youth self-report school engagement questionnaire, teacher rated academic performance, combined math and reading Woodcock-Johnson academic achievement scores, teacher rated on-task classroom behaviors from the SSRS, teacher rated frequency of behavioral difficulties resulting in contact with parents, and teacher rated attendance. Models consisting of one through ten profiles were estimated as displayed in Table 2. The four-profile solution was supported by all three information criterion indices (AIC, BIC, and SABIC) as better fitting the data than models with fewer profiles. Entropy, or the quality of classification, was also higher for the four-profile model than for models with fewer profiles. Some statistics, including AIC, BIC, SABIC, and entropy, potentially supported the interpretation of up to nine profiles, but the best log-likelihood value was not replicated for models with more profiles, even when using very high starting values, suggesting a local maxima and poor fit of these models for the data. These models with additional profiles also yielded very small profile sizes. The four-profile model ($LogL = -36{,}100.07$, $AIC = 72{,}346.13$, $BIC = 72{,}776.04$, $SABIC = 72{,}544.09$, $LMR\text{-}LRT = 1396.25$, $p = 0.66$, Entropy $= 0.83$) was determined to be the most conceptually meaningful and statistically sound of the options.

Description of the Profiles

Standardized estimated within-profile means for these four profiles and significant differences between profiles are displayed in Table 3. A graph of the standardized within-profile means for each variable is displayed in Fig. 1. Table 4 displays within profile means and percentages for demographic, child welfare, and mental health variables. Profiles are interpreted by profile size from largest to smallest. Profile 4, the largest of the profiles, representing 50.1% of the total sample, demonstrated significantly better scores on 12 indicators of school adaptation compared to all three other profiles. Profiles 1 and 4 were not significantly different regarding frequency of being sent to the office, as the frequency was low for both groups, and Profile 2 had significantly more absences than Profile 4. Given the positive adaptation across indicators, Profile 4 will be referred to as the "high overall adaptation group."

Profile 2, which was the second largest of the profiles (22.9% of total sample) demonstrated moderate levels of school adaptation across most indicators. Specifically, Profile 2 demonstrated significantly better adaptation than Profiles 1 and 3 with regards to getting along with other students, getting along with teachers, finding classes interesting, trying their best on schoolwork, paying attention, completing homework, and lower rates of hating school. Profile 2 also reported significantly higher rates of enjoying school compared to Profile 1 and significantly lower rates of student reported being sent to the office regarding behavior compared to Profile 3. Interestingly, there were several areas in which Profile 2 demonstrated significantly worse school adaptation than Profile 1, including worse teacher rated classroom behavior, higher rates of teacher reported frequency of contacting parents regarding behavior problems compared to Profile 1, and higher rates of student reported

Table 2 Fit indices and entropies for latent profile analysis models

Number of Profiles	LogL	Best LogL replicated	Number of Parameters	AIC	BIC	SABIC	LMR-LRT (p)	Entropy
1 Profile	−39,439.059	Yes	28	78,934.119	79,099.013	79,010.048	–	–
2 Profiles	−37,769.407	Yes	43	75,624.813	75,878.044	75,741.420	3311.323 (0.0487)	0.780
3 Profiles	−37,211.070	Yes	58	74,538.140	74,879.707	74,695.424	1107.315 (0.5720)	0.699
4 Profiles	−36,100.066	Yes	73	72,346.132	72,776.036	72,544.092	1396.246 (0.6636)	0.833
5 Profiles	−35,787.113	No	88	71,750.226	72,268.466	71,988.863	430.039 (0.5380)	0.849
6 Profiles	−35,102.542	No	103	70,411.085	71,017.661	70,690.398	1072.539 (0.7119)	0.838
7 Profiles	−34,836.727	No	118	69,909.454	70,604.366	70,229.444	527.913 (0.5921)	0.796
8 Profiles	−34,383.188	Yes	133	69,032.377	69,815.625	69,393.043	744.982 (0.7128)	0.795
9 Profiles	−34,259.974	No	148	68,815.948	69,687.533	69,217.292	242.150 (0.7717)	0.789
10 Profiles	−34,321.939	No	163	68,969.877	69,929.798	69,411.897	−647.479 (0.6016)	0.788

LogL Log likelihood value; *AIC* Akaike information criterion; *BIC* Bayesian information criterion; *SABIC* Sample-size adjusted Bayesian information criterion; *LMR-LRT* Adjusted Lo-Mendell-Rubin likelihood ratio test. A statistical significant LMR LRT (i.e., $p < .05$) indicates that the k profile model fits the data statistically better than does the $k-1$ profile model

Table 3 Within profile Z-score means and significant differences between profiles by variable

Variable	Profile 1 M (SE)	Profile 2 M (SE)	Profile 3 M (SE)	Profile 4 M (SE)	Significant differences
1. T—Academic performance	−0.20 (.18)	−0.36 (.09)	−0.20 (.15)	0.28 (.08)	1<4***, 2<4***, 3<4***
2. S—Woodcock Johnson	−0.03 (.11)	−0.07 (.07)	−0.17 (.13)	0.20 (.08)	1<4***, 2<4***, 3<4***
3. T—Days absent	0.09 (.13)	−0.03 (.10)	0.08 (.12)	0.11 (.07)	2>4***
4. S—Gets along w/other students	−0.28 (.13)	−0.13 (.07)	−0.46 (.12)	0.33 (.06)	1<2***, 1<4***, 2>3**, 2<4***, 3<4***
5. S—Gets along w/teachers	−0.50 (.16)	−0.20 (.10)	−0.81 (.15)	0.44 (.05)	1<2***, 1<4***, 2>3***, 2<4***, 3<4***
6. S—Enjoy school	−0.88 (.15)	−0.24 (.08)	−0.51 (.15)	0.48 (.08)	1<2***, 1<3***, 1<4***, 2<4***, 3<4***
7. S—Hate school	−0.55 (.19)	−0.27 (.09)	−0.44 (.17)	0.47 (.05)	1>2***, 1>3**, 1>4***, 2<3*, 2>4***, 3>4***
8. S—Find classes interesting	−0.64 (.11)	−0.06 (.09)	−0.48 (.13)	0.40 (.09)	1<2***, 1<3***, 1<4***, 2>3*, 2<4***, 3<4***
9. S—Try your best on work	−0.46 (.16)	−0.13 (.08)	−0.28 (.15)	0.35 (.06)	1<2***, 1<4***, 2>3***, 2<4***, 3<4***
10. S—Pay attention	−0.47 (.15)	−0.31 (.08)	−0.75 (.19)	0.41 (.08)	1<2**, 1>3*, 1<4***, 2>3***, 2<4***, 3<4***
11. S—Complete homework	−0.35 (.15)	−0.21 (.09)	−0.58 (.14)	0.42 (.05)	1<2***, 1<4***, 2>3***, 2<4***, 3<4***
12. T—SSRS classroom behavior	−0.00 (.17)	−0.50 (.09)	−0.32 (.19)	0.36 (.08)	1>2*, 1<4***, 2<4***, 3<4***
13. T—Contact parents re behavior	0.01 (.18)	−0.65 (.09)	−0.53 (.18)	0.31 (.09)	1>2***, 1>3***, 1<4***, 2<4***, 3<4***
14. S—Sent to office	0.60 (.00)	−0.68 (.00)	−2.45 (.08)	0.60 (.00)	1<2***, 1<3***, 2<3***, 2>4***, 3>4***

* < .05, ** < .01, *** < .001. S indicates student rated and completed variables. T indicates teacher rated variables

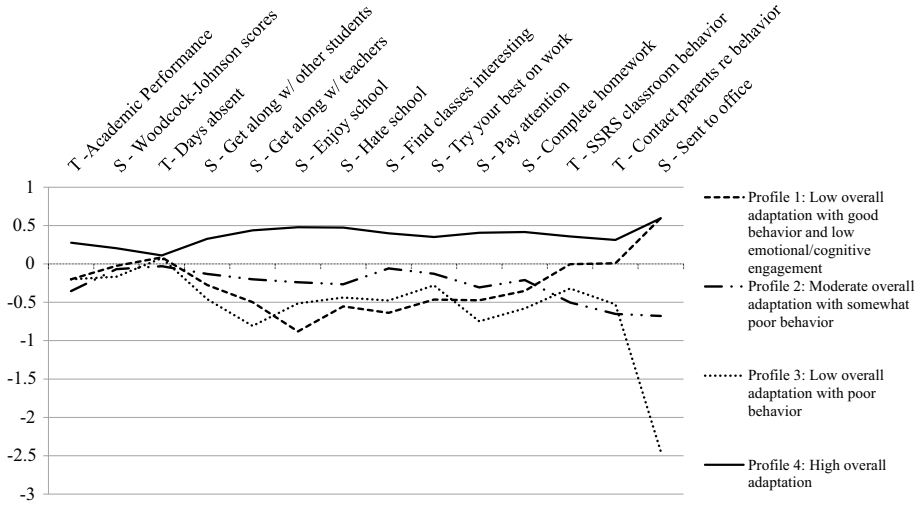

Fig. 1 Within school adaptation profile mean Z-scores for indicators of school adaptation

being sent to the office regarding behavior problems. Profile 2 will therefore be referred to as the "moderate overall adaptation with somewhat poor behavior group."

With regards to the smallest two profiles of school adaptation, Profile 1 (17.8% of the sample) and Profile 3 (9.2% of the sample) differed in some significant ways. As illustrated in Fig. 1, Profiles 1 and 3 had lower levels of school adaptation than Profiles 2 and 4 on many indicators, but separated from each other in some important ways. Profile 1 outperformed Profile 3 with regards to paying attention, teacher reported frequency of contacting parents regarding behavior problems, and student reported rates of being sent to the office for behavior problems. At the same time, Profile 3 outperformed Profile 1 with regards to enjoying school, finding classes interesting, and lower rates of hating school, though these indicators were not as high as the moderate overall adaptation with somewhat poor behavior group or the high overall adaptation group as described above (except that the difference between Profiles 2 and 3 was not statistically significantly different with regards to enjoying school). Profile 3 will therefore be referred to as the "low overall adaptation with poor behavior group" and Profile 1 will be referred to as the "low overall adaptation with good behavior and low emotional and cognitive engagement group."

Aim 2: Predictors of School Adaptation Profiles Among Youth Involved with Child Welfare Services

Fit statistics indicate that the multinomial logistic regression model fit the data well. The Pearson χ^2 value of the multinomial logistic regression was 3681.861 ($df = 3771$, $p = .848$) and the Deviance χ^2 value was 3362.291 ($df = 3771$, $p = 1.000$). Non-significance of these tests suggests that the model fits the data well (Petrucci, 2009). Additionally, the final log likelihood value was 4261.854 ($\chi^2 = 203.188$, $df = 36$, $p < .001$) suggesting that the variables in this model significantly improve the model over the intercept alone.

Results indicate that alleged abuse type experienced, substantiation of maltreatment, and child race or ethnicity did not significantly predict school adaptation profile membership overall. Caseworker rated maltreatment severity ($\chi^2 = 7.889$, $p = .048$), child age

Table 4 Within profile means and percentages for demographic, child welfare, and mental health variables

Variable	Overall M (SD)	Profile 1 M (SD)	Profile 2 M (SD)	Profile 3 M (SD)	Profile 4 M (SD)
Age	9.96 (2.88)	10.27 (2.89)	10.36 (2.92)	10.73 (2.89)	9.52 (2.80)
Maltreatment severity	2.38 (1.02)	2.47 (1.00)	2.31 (0.99)	2.32 (1.02)	2.40 (1.03)
Wave 1 mental health T-score	59.36 (12.42)	60.40 (12.19)	61.57 (12.03)	64.12 (11.64)	57.12 (12.35)
	Overall %	Profile 1%	Profile 2%	Profile 3%	Profile 4%
Gender					
Female	52.8	54.6	39.5	39.0	60.8
Male	47.2	45.4	60.5	61.0	39.2
Race					
White	45.7	43.2	44.4	43.1	47.5
Black	29.6	32.1	33.9	32.1	26.4
Hispanic	16.5	16.7	14.9	15.4	17.3
Other	7.9	7.6	6.4	9.3	8.5
Alleged type of abuse					
Physical	23.6	21.1	25.9	28.5	22.5
Sexual	16.5	14.1	14.6	15.9	18.2
Emotional	7.0	4.9	6.4	8.1	7.9
Neglect	38.3	40.3	39.2	36.2	37.6
Other	6.3	8.2	5.4	5.3	6.1
Substantiation of maltreatment					
Substantiated	60.2	62.9	57.9	64.2	59.6
Other Than Substantiated	39.8	37.1	42.1	35.8	40.4

($\chi^2 = 67.841$, $p < .001$) and child gender ($\chi^2 = 97.541$, $p < .001$) significantly predicted profile membership. Compared to the high overall adaptation group ($\bar{x} = 9.52$), all other profiles of school adaptation were significantly older (Profile 1: $\bar{x} = 10.27$, $B = .094$, $p < .001$; Profile 2: $\bar{x} = 10.36$, $B = .117$, $p < .001$; Profile 3: $\bar{x} = 10.73$, $B = .162$, $p < .001$) and significantly more likely to include males than females (Profile 1: male = 52.0%, $B = -.365$, $p = .002$; Profile 2: male = 60.5%, $B = -.904$, $p < .001$; Profile 3: male = 61.0%, $B = -1.067$, $p < .001$). Caseworker reported severity of maltreatment did significantly predict profile membership overall. Pairwise comparisons revealed there was a marginally significant difference between level of caseworker reported severity of maltreatment between the low overall adaptation with poor behavior group ($\bar{x} = 2.32$) and the high overall adaptation group ($\bar{x} = 2.40$, $B = -.153$, $p = .077$).

Aim 3: Examining the Role of School Adaptation in Buffering the Effects of Child Welfare Indicators of Maltreatment on Mental Health Outcomes

Table 5 displays the unstandardized beta-coefficients (B), standardized beta-coefficients (β), and t values for the model predicting mental health outcomes at wave 4. Values in Table 5 come from Step 2 of the model, except for the values for the interaction terms,

Table 5 Hierarchal regressions predicting mental health outcomes

2nd Step	B (SE)	β	*t*
W1 mental health	0.55 (0.20)	0.53	27.62***
Race/ethnicity (reference is white (n = 949))			
Black ($n = 591$)	−.49 (.56)	−.02	−.87
Hispanic ($n = 327$)	−1.04 (.69)	−.03	−1.52
Other ($n = 137$)	−.23 (.97)	−.01	−.23
Abuse type (reference is neglect (n = 839))			
Physical ($n = 512$)	−.12 (.59)	−.004	−.20
Sexual ($n = 355$)	−.56 (.68)	−.02	−.82
Emotional ($n = 151$)	−1.19 (.94)	−.03	−1.27
Other ($n = 131$)	.38 (.99)	.01	.38
Substantiation of maltreatment	−.02 (.56)	−.001	−.03
Severity of maltreatment	.68 (.28)	.05	2.38*
Profile Membership (reference is profile 4 (n = 1025)			
Profile 1 ($n = 352$)	1.14 (.66)	.03	1.72†
Profile 2 ($n = 443$)	1.79 (.61)	.06	2.93**
Profile 3 ($n = 185$)	2.84 (.86)	.07	3.31**
3rd Step			
Profile 1 X Severity of maltreatment	.43 (.65)	.03	.51
Profile 2 X Severity of maltreatment	.67 (.60)	.06	1.12
Profile 3 X Severity of maltreatment	.73 (.83)	.04	.88

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. $N = 1987$. All values come from step 2 of the model, except values for the interaction terms come, which from step 3 of the model. Model step 1 summary statistics: $R^2 = .300$, $F(10, 2378) = 101.81$, $p < .001$. Model step 2 summary statistics: $R^2 = .314$, $F(13, 1973) = 69.337$, $p < .001$, $\Delta R^2 = .014$, F change = 13.42, $p < .001$. Model step 3 summary statistics: $R^2 = .314$, $F(16, 1970) = 56.413$, $p < .001$, $\Delta R^2 < .001$, F change < .001, $p = 1.00$

which come from Step 3 of the model. Mental health symptomology at Wave 1 and caseworker reported severity of maltreatment significantly predicted mental health symptomology at Wave 4. Race or ethnicity, substantiation of abuse or neglect, and alleged type of maltreatment did not significantly predict mental health symptomology at Wave 4 when controlling for other relevant covariates. As predicted, school adaptation profile membership marginally to significantly predicted mental health symptomology at Wave 4. Compared to the high overall adaptation group, membership in the low overall adaptation with good behavior and low emotional and cognitive engagement group was associated with a 1.14 increase in T-score on the total mental health problems index of the CBCL, membership in the moderate overall adaptation with somewhat poor behavior group was associated with a 1.79 increase in T-score, and membership in the low overall adaptation with poor behavior group was associated with a 2.84 increase in T-score. Not surprisingly, youth behavior in the classroom may be an important dimensions of school adaptation that differentiates profiles on this index of emotional and behavioral symptom severity. Including school adaptation profile membership in the model predicting mental health at Wave 4 did significantly increase the variance accounted for by the model ($\Delta R^2 = .014$, $\Delta F = 13.42$, $p < .001$). The interactions of school adaptation profile membership dummy codes and caseworker reported severity of maltreatment did not significantly predict mental health symptomology at Wave 4. Including the interaction terms in the model predicting mental health at Wave 4 did not significantly increase the variance accounted for by the model ($\Delta R^2 < .001$, $\Delta F < .001$, $p = 1.00$).

Discussion

The goals of this study were to examine the school adaptation of youth in contact with the child welfare system in a holistic and student-centered way, as well as the relations of school adaptation with relevant risk factors and mental health outcomes. We hypothesized that school adaptation would include a range of related but separate indicators that would distinguish youth into meaningful groups, that membership in these groups would be related to known risk factors in this population, and that school adaptation groups would predict later mental health functioning. Support for hypotheses was mixed.

Aim 1: Identification of Profiles of School Adaptation Among Youth Involved with Child Welfare Services

Aim 1 examined the school adaptation of youth involved with child welfare services by incorporating student and teacher reports of a variety of indicators, simultaneously. Consistent with our hypotheses, latent profile analysis revealed four separate profiles of school adaptation within this sample, which were more nuanced than simply high and low adaptation groups, and had significant differences across a range of indicators. This approach allowed us to identify the "high overall adaptation group," representing 50.1% of the sample. This group enjoyed better school adaptation than the other three groups on almost all indicators of school adaptation. The second largest school adaptation profile found, which we described as the "moderate overall adaptation with somewhat poor behavior group" represented nearly a quarter of our sample. This group demonstrated a significant downshift on all indicators of school adaptation when compared to the high

overall adaptation group, but did fare better than either of the low adaptation groups with regard to their relational, emotional, and cognitive engagement, but exhibited poor school behavior.

The low overall adaptation group with good behavior and low emotional and cognitive engagement, representing an additional 17.8% of the overall sample, experienced the worst emotional and cognitive engagement with school, but demonstrated better behavioral engagement. Simply put, this is a group who experienced poor school adaptation overall, does not feel an emotional connection or interest in school, but is not disruptive in the classroom and is not getting into trouble. It is easy to imagine that these youth may be the students who are struggling in school, but "fly under the radar," because they do not present as behavioral challenges for teachers. It is also interesting that this group, despite a lack of behavioral problems, demonstrated academic competence similar to that of the two groups who did demonstrate behavioral problems. Clearly, behaving well is not enough to perform well academically or function within the school context, and other factors, including relationships, emotional engagement, and cognitive engagement, may be just as important determinants of success in the school context. Lastly, we identified a small group (9.2% of the sample) of individuals with low overall school adaptation across most indicators, but with significantly greater behavioral problems than the other groups. Clearly, this is a group that is struggling with all aspects of school adaptation.

Contributing to a more comprehensive understanding of the school adaptation among youth in this unique population was a primary aim. Results support the contention that using single indicators as proxies for school adaptation, or averaging indicators into a single variable or few dimensions, do not sufficiently represent the relation between youth and school. Not only did all 14 indicators of school adaptation have surprisingly low correlations, but all of these indicators helped separate out latent groups. Additionally, some of the most commonly used indicators of school adaptation, such as attendance, standardized achievement scores, and teacher rated academic performance, demonstrated the least variability between profiles and provided the least information regarding where individuals best fit, further demonstrating that proxies may not adequately approximate the broader construct of school adaptation. This study demonstrated that in a group in which only about half of youth experience optimal school adaptation, such as those involved with child welfare services, it is necessary to incorporate the perspectives of a range of stakeholders and consider the multiple components of how youth interact with school.

Aim 2: Predictors of School Adaptation Profiles Among Youth Involved with Child Welfare Services

We also sought understand the relations between these profiles of school adaptation, demographic variables, and risk factors associated with involvement with the child welfare system. Not surprisingly, we found that girls were more likely than boys to be in the highest overall adaptation group. Also consistent with our predictions, we found that older youth were less likely than younger youth to be in the high overall adaptation group. Interestingly, we found that race or ethnicity did not significantly predict school adaptation profile membership in multivariate analyses. While racial differences have been found in school engagement in past research when examining the general student population (Johnson et al. 2001; Konold et al. 2017), perhaps these differences are less salient among a sample comprised solely of youth involved with child welfare services and experiencing high levels of adversity.

Regarding child welfare indicators, we found that alleged type of abuse investigated and substantiation of maltreatment did not significantly predict school adaptation profile membership. This lack of results regarding child welfare variables, while not consistent with our hypotheses, could indicate that these subjective and limited measures of maltreatment type, severity, and substantiation are not detecting meaningful variation in youth experience or that they do not adequately measure the experience of children that have been maltreated. It is also possible that all youth in the child welfare service involved population have passed a threshold of risk and that these additional factors related to the experience of maltreatment do not explain additional meaningful variance in outcomes such as school adaptation. Overall, child welfare indicators were not critical determinants of school adaptation profiles in the present study.

Aim 3: Examining the Role of School Adaptation in Buffering the Effects of Child Welfare Indicators of Maltreatment on Mental Health Outcomes

We also examined potential relations between school adaptation profiles, child welfare indicators of maltreatment and mental health outcomes. A secondary goal of this aim was to evaluate possible interactions of maltreatment severity and school adaptation. Race or ethnicity, substantiation of maltreatment, and alleged type of maltreatment experienced did not significantly predict mental health outcomes. Mental health symptomology at Wave 1, higher ratings of maltreatment severity, and school adaptation profile membership significantly predicted later mental health problems in a mostly intuitive manner, with one unexpected finding. Not surprisingly, the high overall adaptation group experienced the lowest levels of mental health symptomology at Wave 4, the low overall adaptation with poor behavior group experienced the greatest mental health symptomology at Wave 4. The low overall adaptation with good behavior and low emotional and cognitive engagement group had the second lowest ratings of mental health symptomology at Wave 4, and the moderate overall adaptation with somewhat poor behavior group had the second highest. It is important to note that follow up analyses revealed that differences in mental health functioning between these two groups did not reach statistical significance.

Lastly, we hypothesized that school adaptation would buffer the impact of maltreatment severity on mental health functioning long-term. This study failed to find significant interactions of profile membership and caseworker reported severity of maltreatment on youth mental health functioning. There are several possible explanations for this unexpected finding. First, it may be the case that examining outcomes 3 years later made it impossible to detect buffering effects, as mental health had improved in the sample overall. Perhaps moderation effects would have been detectable while examining more proximal mental health outcomes. Additionally, the lack of significant interactions may be attributable to the fact that this sample did not include a non-child welfare system involved control group and that most of the sample, even those rated as experiencing no maltreatment, had passed an unknown threshold of risk simply by being involved with child welfare services. We expect that including youth who most accurately represent the "no maltreatment" end of the spectrum (those that have no involvement with child welfare services), buffering effects of school adaptation on maltreatment severity may be found that were not in the present study.

Strengths, Limitations, and Future Directions

The current study benefited from a number of strengths. First, this study utilized a large, longitudinal, and nationally representative sample of children who were involved with child welfare services regarding alleged maltreatment. This study also incorporated reports from youth, their caregivers, child welfare agency caseworkers, and teachers. It is also one of the first studies to examine profiles of school adaptation in this specific population.

This study also had several important limitations. This study relied on caregiver reports to measure youth mental health functioning. This is less than ideal, considering that some of these caregivers were foster parents who may have not known the children very long, and some of these caregivers were alleged perpetrators of abuse and neglect. Conversely, youth report was utilized for 10 of the 14 indicators of school adaptation. This limitation is acceptable, as we were interested in understanding these aspects of school adaptation from the youth's perspective.

Additionally, several of the measures utilized in this study do not have well-established psychometric properties. For example, the teacher report on youth behavioral difficulties at school is a limited series of two questions that ask teachers if the student's parents have been contacted regarding behavioral problems at school and if this has happened once or more than once. This measure of behavioral difficulties does not have established norms or psychometric properties and does not provide information about the nature of behavioral difficulties or specifics about the frequency of these problems. Additionally, the caseworker report on the Maltreatment Classification Scale (Manly et al. 1994), while a well-established measure, was adapted for the current study to include only a few items to assess the maltreatment experiences of youth. Perhaps reliance on a global measure of maltreatment type and severity, and the artificial categorization into a single maltreatment category indicated as the most severe, influenced the lack of findings regarding interactions of maltreatment and school adaptation profile and the impact on mental health outcomes. The school engagement questions from the Drug-Free Schools and Communities Act Survey (Dowd et al. 2004) has limited information available regarding psychometric properties and factor structure. While the brief nature of many of these measures was appropriate given the range of topics covered in the NSCAW interviews, future work focused on school adaptation specifically would benefit from more comprehensive and well-validated measures of the many identified components of school adaptation.

The findings and limitations of the current study point the way towards a range of directions for future research. As mentioned above, future studies should incorporate multiple respondents on multiple indicators of school adaptation, utilize comprehensive and psychometrically sound measures, and replicate findings with other samples. Additionally, future studies should compare profiles of school adaptation among youth involved with child welfare services to those in the general population in order to understand how these profiles are similar or discrepant. Given the high rates of school instability among at-risk youth, it would also be important to explore how school instability impacts school adaptation with this nuanced and comprehensive view. Subsequent work may explore if school adaptation profiles predict other important outcomes, such as cognitive functioning, educational attainment, employment, or life satisfaction. Additionally, the gained understanding of school adaptation profiles and their impact on youth mental health may inform intervention in the future.

Clearly, schools are important in the lives of youth involved with the child welfare system, and success in this context can lead to better mental health outcomes. Successful

school adaptation is not made or broken solely by experiences of adversity. It is important to note that successful school adaptation is also not as simple as performing well on standardized achievement tests. The findings of this study demonstrate the significant role of other aspects of school adaptation, including emotional, relational, cognitive, and behavioral connection to school.

The current studies highlighted the importance of behavioral functioning with regard to overall school adaptation, but behavioral health is generally regarded as a low priority compared to test scores and other more traditional indicators of success at school. In a special issue of interventions targeting student motivation and engagement, Wigfield and Wentzel (2007) raise the concern that too many school-based programs in the years following the No Child Left Behind (2003) legislation focused on the cognitive skills and academic performance of students, without due attention to the motivation and engagement of students. They discuss practices and interventions that are focused on aspects of youth adaptation at school, including motivation, positive social-emotional climates in schools, and social skills, that not only lead to social, emotional, and behavioral benefits, but also contribute to increased academic performance. Our findings support a broad conceptualization of school adaptation and potentially support corresponding interventions that go beyond academics and schoolwork to bolster the behavioral, social, and emotional components of school adaptation.

The last several decades have seen a rise in evidence-based interventions that target numerous aspects of school adaptation (Rathvon 2008). Some promising interventions that move beyond academic intervention include programs that target student social interactions (e.g., Positive Peer Reporting; Morrison and Jones 2007), self-monitoring of behavior (e.g., Three Steps to Self-Managed Behavior; Rathvon 2008), and even interventions focused on improving aspects of the school environment outside the classroom, such as the playground (e.g., Loop the Loop: A Schoolwide Intervention to Reduce Problem Behavior on the Playground; Rathvon 2008). These innovative programs address aspects of school adaptation that are often excluded from conceptualizations of school success but nonetheless play a role in youth school adaptation and mental health. Future research should endeavor to identify the ideal leverage points for improving school adaptation overall, then apply evidence-based interventions strategically to improve not only the academic competence of youth, but their overall experience and connection to school, and therefore impact distal and crucial outcomes.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Consent to Participate Consent for participation of youth was obtained from the person with the legal authority to do so, and youth participants provided assent. Caregivers and caseworkers consented for their own participation.

Ethics Approval The secondary analysis of this data, for the purposes of the current study, was approved by the University of Denver IRB.

Research Involving Human Participants and/or Animals The secondary analysis of this data, for the purposes of the current study, was approved by the University of Denver IRB.

Informed Consent Procedures for obtaining informed consent from participants and their legal guardians was approved by the Research Triangle Institutes's Institutional Review Board.

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