

Risk and Resilience in the Internalizing Outcomes of Children in Out-of-Home Care

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Abstract

Internalizing problems are prevalent in childhood and adolescence in both community and out-of-home populations. Internalizing symptoms are frequently associated with problems in other areas of functioning as well. For children in out-of-home care, who face additional adversities such as maltreatment and witnessing traumatic events, internalizing problems have shown increased prevalence while less frequently addressed in research. The current studies used longitudinal data collected across 7 years from a sample of 1,765 children, 5 to 14 years old, in out-of-home care in Maryland, USA. Data consisted mainly of Child and Adolescent Needs and Strengths (CANS) assessments, as well as demographic information (age, sex, and race/ethnicity) and out-of-home placement type. In Study 1 we examined the trajectories of anxiety and depression across age and time in care separately and evaluated a comprehensive model of resilience for each outcome using hierarchical linear modeling. This exploratory model included both indicators of internal resilience (i.e. cognitive, emotional, spiritual, physical, behavioural) and environmental risk and resilience factors (i.e. family, acculturation, community, placement, school functioning, social functioning) related to internalizing problems in children and adolescents. Results showed anxiety was fairly stable over time in care and age, with few significant predictors aside from already well-known risk factors. Depression results showed a slight increase across age and decrease across time in care with several more significant predictors than the anxiety model. While both models showed overlap in predictors, they also included predictors unique to each outcome. In Study 2 we examined the reciprocal relationships across time between anxiety, depression, and significant risk and protective factors from Study 1. Using time lagged hierarchical linear models we found few significant relationships related to

anxiety, and largely unidirectional relationships between depression and relevant factors over time. Two factors, traumatic stress and placement in residential treatment care, displayed reciprocal relationships with depression over time. However, our results largely did not support the direct resilience feedback mechanisms proposed between variables for either outcome, but revealed other possible mechanisms at work (i.e. dual cascades developmental model) to explain maladaptation towards depression in particular, but also anxiety. Findings are discussed in terms of theoretical implications, future research directions, and applied implications for prevention/intervention programs for internalizing problems for children in out-of-home care.

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Risk and Resilience in the Internalizing Outcomes of Children in Out-of-Home Care

General Introduction

The purpose of this dissertation is to better understand the internalizing problems of children in out-of-home care. The first goal is to model the longitudinal anxiety and depression symptoms for children in out-of-home care, and examine environmental and internal factors that influence these outcomes in order to gain insight into the factors that build resilience in this population. The second goal is to gain a deeper understanding of the relationships between internalizing problems and the internal and environmental factors related to these problems by examining the reciprocal nature of these relationships over time. These goals will be evaluated within the context of an exploratory resilience model.

Child Welfare

In the mid 1990's Canada and the United States were considered protection-oriented countries that focused on abuse, legal rights, and involuntary out-of-home placements, rather than family service-oriented where the focus is on family dysfunction, therapeutic interventions, and partnerships between families and the welfare system. However, in the last decade, the North American child welfare systems have begun to shift towards a family service-oriented approach and de-institutionalization (Courtney, Flynn, & Beaupré, 2013).

In 2007, approximately 67, 000 (1%) children in Canada were in out-of-home care (Courtney et al., 2013). This rate is comparable to the 2007 rate in the United States, which was 491,000 (approximately 0.5%) children (U.S. Department of Helth and Human Services, 2009). In North America, the majority of out-of-home care is provided by foster homes (75% in the United States and 66% in Canada), while a smaller percentage of children in

out-of-home care are placed in institutional (9% in the United States, 4% in Canada) or group home settings (6% in the United States, 14% in Canada) (Courtney et al., 2013; U.S. Department of Health and Human Services, 2013).

The majority of children who enter out-of-home care do so for reasons of neglect and abuse (Courtney et al., 2013). This abuse and/or neglect can contribute to the development of serious emotional, behavioural, cognitive, and/or physical problems (Burns et al., 2004; DuRoss, Fallon, & Black, 2010; Pears & Fisher, 2005) and, in all likelihood, dangerous behaviours (Chor, McClelland, Weiner, Jordan, & Lyons, 2012).

Internalizing Problems

In the general U.S. population, periodic prevalence rates for depression in children 3 to 17 years old range between 3.0% - 8.1% (Centers for Disease Control and Prevention [CDC], 2013; Fuhrmann, Equit, Schmidt, & von Gontard, 2013); and periodic rates for anxiety disorders among children 3 to 19 years old range between 2.6% to 16.6% (Beesdo, Knappe, & Pine, 2009; CDC, 2013), depending on age. These rates are similar to those reported in Canadian populations (Beesdo et al., 2009; Breton et al., 1999).

For children placed in out-of-home care, rates for emotional disorders appear to be much higher than those in the general population. Rates of emotional disorders have been found to be between 27% and 58% for this young population (Lyons, Libman-Mintzer, Kisiel, & Shallcross, 1998; McMillen et al., 2005; Whitted, Delavega, & Lennon-Dearing, 2013). In a sample of 333 children and adolescents 5 to 21 years old in residential care with the Illinois Department of Child and Family Services, Lyons et al. (1998) found 54.5% of children met criteria for an emotional disturbance (including internalizing problems) as rated by child welfare case workers and staff on the Child Severity of Psychiatric Illnesses.

Ratings on this measure are analogous to DSM-IV diagnostic criteria. Similarly, McMillen et al. (2005) examined the prevalence of psychiatric disorders in a sample of 373 17-year-olds in out-of-home care in the United States, using the Diagnostic Interview Schedule for DSM-IV. They found that 27% of adolescents met criteria for major depression. And in a sample of 670 children 3 to 11 years old in out-of-home care across the United States, Whitted et al. (2013) found 58% of children were in the borderline or abnormal range on emotional symptoms. Emotional symptoms were assessed using the parent version of the Strengths and Difficulties Questionnaire at the time of entry into care. These rates are much higher than the 3 to 17% found in the general population as described above.

However, other studies have found rates closer to those reported in the general population. Garland et al. (2001) found periodic prevalence rates for anxiety disorders to be 8.6%, and depression to be 4.7% among children 6 to 18 years old from the U.S. child welfare system whose placements were designated “under court jurisdiction,” indicating out-of-home placements. Depression and anxiety disorder status was determined using parent and child DISC-IV interviews. The variability among out-of-home internalizing prevalence rates may be due in part to methodological factors such as participant age, respondent type (i.e. child, parent, clinician), and the diagnostic instruments and methods used (Wittchen & Jacobi, 2005). However, overall these rates appear to be much higher than those found in children in the general population. These rates are not surprising; as mentioned previously, children are often placed in out-of-home care by reason of abuse and/or neglect, which can contribute to serious behavioural and/or emotional problems.

The effects of internalizing problems on other areas of functioning. The internalizing problems experienced by children in out-of-home care can have effects far

beyond the symptoms of these disorders themselves. For adolescents in residential substance abuse treatment, having elevated depression at intake predicts poorer outcomes for substance abuse treatment, even after controlling for other risk factors (Subramaniam, Stitzer, Clemmey, Kolodner, & Fishman, 2007). The Kansas Intensive Permanency Project found that children with serious emotional disturbances had increased barriers to placement permanency (U.S. Department of Health and Human Services. Children's Bureau, 2014). According to this report, children in out-of-home care had received many assessments but rarely received appropriate services, in part due to difficulties attending regular appointments as a result of unstable residency. This sometimes resulted in even greater placement instability and repeated psychiatric hospitalizations.

For children in out-of-home care, symptoms of anxiety, depression and general mental health problems have been associated with lower quality of life (Damnjanovic, Lacic, Stevanovic, & Jovanovic, 2011). Further, it appears that being in out-of-home care is associated with adult mental health problems. Research involving adults who had previously been in out-of-home care reveals that having been in residential and/or foster care as children and adolescents placed them at increased risk of depression as adults compared to individuals who had never been placed in out-of-home care (Dregan & Gulliford, 2012; Herman, Susser, & Struening, 1994). They further found the highest likelihood of depression to be in those who had been in residential care. Since children in out-of-home placements seem to experience more internalizing problems than other children, and these problems affect other areas of functioning as well, understanding the changes in internalizing problems over time for this population is important in order to improve current and future well being for these children.

Trajectories of internalizing problems. In the general population, the developmental trajectories for the majority of children indicate anxiety symptoms are fairly low and stable over time, while a minority experience high, stable anxiety symptoms (Broeren, Muris, Diamantopoulou, & Baker, 2013). These trajectories were determined from a community sample of 224 children, 4 to 11 years old. Research on the developmental trajectories for childhood depressive symptoms in the general population indicates these patterns are slightly more complex than those for anxiety. In a community sample of 3,902 children aged 9 to 14, Fernandez, Castelao, & Kröner-Herwig (2013), found that the majority of children (63%) experience low but increasing depression over time, while some (28%) experience moderate and only slightly increasing depression. A small number (8%) experience high initial depression that decreases over time, and 1% experience very high and stable levels of depression. These trajectories may present differently for children in out-of-home care.

In a sample of 2,302 children in the U.S. child welfare system (7 to 14 years old), growth curve analysis indicated that depression symptom scores on the Children's Depression Inventory (CDI) decreased over time (Orton, 2008). This pattern is in contrast to what is seen in the general population where depression levels typically increase over time. Similarly, in a sample of 404 older youth (17 to 19 years old) exiting the US foster care system, depression scores on a self-report measure of depression (the Depression – Arkansas Scale) remained fairly stable over time, with a slight decrease across the two years youth were assessed (Munson & McMillen, 2010). This overall trajectory is similar to that found by Orton (2008) above. Class analysis further revealed three trajectories for

depression symptoms over time for this sample: low and stable (78%), increasing depression (6%), and decreasing depression (15%).

Fewer studies have examined anxiety symptoms over time in out-of-home care populations. In a sample of 38 female adolescents (13 to 18 years old) in residential treatment, Augenbraun (2004) found a significant decrease in the number of internalizing problems (i.e. depression, anxiety, eating disorders, hospitalizations, somatic complaints, and suicide) that girls had from the first three months of treatment to the last three months. Lyons, Terry, Martinovich, Peterson, and Bouska (2001) conducted longitudinal analyses on case reviews of 285 adolescents (12 to 17 years old) in several residential treatment facilities in the United States. They used the Acuity of Psychiatric Illness - Child and Adolescent Version to evaluate adolescents in four domains: high-risk behaviours, psychiatric symptoms, functioning, and system support (e.g. parental support, safety). This 20-item measure uses anchored rating on a 0 to 3 scale. They found that during the first two years of residential treatment depression scores decreased while anxiety scores increased. They also found that adolescents diagnosed with emotional disorders at intake were more likely to show improvement in overall functioning during residential treatment.

It appears that, unlike in the general population, depression scores for children in the United States child welfare system tend to decrease over time. There is little research examining developmental trajectories of anxiety for children and adolescents who have been placed in out-of-home care settings. The limited research to date provides some evidence that anxiety symptoms may decrease during time in care. However, other research suggests anxiety may actually increase during time in care, a finding that may have important implications on the future mental wellbeing of these individuals. The

reason that trajectories might differ in out-of-home care and community samples may be related to certain environmental and internal factors pertinent to children in out-of-home care.

Risk and Protective Factors for Internalizing Problems in Children in Out-of-Home Care

Previous research has examined various risk and protective factors related to internalizing problems for children involved with the child welfare system. These studies vary greatly in design, outcome measures, risk/protective factors studied, and significant findings. However, there are several themes that can be garnered from this diverse research.

The majority of risk and resilience research in the internalizing symptoms of children in out-of-home care thus far has focused mainly on depression (Munson & McMillen, 2010; Orton, 2008; Stoner, Leon, & Fuller, 2015) or internalizing problems in general (Bell, Romano, & Flynn, 2013; McWey, Cui, & Pazdera, 2010; Tonmyr, Williams, Hovdestad, & Draca, 2011). Only two studies have examined anxiety outcomes alone (Heneghan et al., 2013; Legault, Anawati, & Flynn, 2006). All of the longitudinal studies examined either depression or combined internalizing symptom outcomes (McWey et al., 2010; Munson & McMillen, 2010; Orton, 2008; Stoner et al., 2015). The two anxiety-specific studies were cross-sectional, indicating an overall lack of research on symptoms of anxiety in child welfare populations, particularly longitudinally.

Certain risk and protective factors are frequently found to be related to internalizing problems. These factors include: type and severity of maltreatment (Bell et al., 2013; Heneghan et al., 2013; McWey, Cui, et al., 2010; Munson & McMillen, 2010; Orton, 2008;

Tonmyr et al., 2011), gender (Heneghan et al., 2013; Munson & McMillen, 2010; Orton, 2008; Tonmyr et al., 2011), race/ethnicity (Heneghan et al., 2013; Munson & McMillen, 2010; Orton, 2008; Tonmyr et al., 2011), age (McWey, Cui, et al., 2010; Stoner et al., 2015; Tonmyr et al., 2011), living situation/placement type (Munson & McMillen, 2010), substance use (Munson & McMillen, 2010; Tonmyr et al., 2011), and parent mental health (Heneghan et al., 2013; Munson & McMillen, 2010; Tonmyr et al., 2011). Some studies have revealed additional factors, such as behaviour problems (Munson & McMillen, 2010; Stoner et al., 2015), chronic illness (Heneghan et al., 2013), traumatic stress (Stoner et al., 2015), family functioning/parenting style (Bell et al., 2013; Legault et al., 2006; Stoner et al., 2015), school functioning (Stoner et al., 2015), and frequent residency changes (Tonmyr et al., 2011). However, there are discrepancies between these studies where even the more frequent factors are found non-significant (i.e gender, race, age, placement type, maltreatment type, parent mental health) (Bell et al., 2013; Heneghan et al., 2013; Legault et al., 2006; McWey, Cui, et al., 2010). It appears that there is little consistency between which factors are included in analyses, and further discrepancy between which factors are found to be significantly related to internalizing outcomes.

These studies have also focused primarily on risk factors, particularly the effects of maltreatment type and severity. Only three studies examined protective factors, and within those, findings on protective effects were mixed (Bell et al., 2013; Legault et al., 2006; Stoner et al., 2015). None of the models were fully comprehensive, incorporating all risk and protective factors into a single model. Although Stoner et al. (2015) included every item of a multi-faceted child functioning tool to examine depression outcomes, the analysis was exploratory and including items likely unrelated to the outcome of interest as no

theoretical model was used. Further, their analysis method was quite novel (i.e. optimal data analysis) and only identified the strongest predictors as relevant (Stoner et al., 2015).

From the above discussion, it appears that little research has focused on symptoms of anxiety alone, particularly longitudinally. Further, it is not clear which risk and protective factors are the most important considerations for the internalizing outcomes of children in out-of-home care. Protective factors have been particularly under-studied in this area. In order to properly examine the relevant risk and protective factors related to internalizing outcomes, a comprehensive theoretical model is needed.

Models of Risk and Resilience

Early models of stress and vulnerability, such as the diathesis-stress model, suggests some individuals have a vulnerability that makes them more susceptible to the negative symptoms associated with stress (Zuckerman, 1999). In this model, it is believed that each person has a vulnerability threshold for various mental health problems, and where some individuals will have a pathological episode provoked by minor stress or hassles, a non-vulnerable person would require a catastrophic event for the same psychological reaction. Adaptations to this model have lead to more complex models, such as the differential susceptibility approach which suggests that those individuals who might be most vulnerable to stress are the same individuals who benefit the most from environmental support and enrichment (Belsky & Pluess, 2009). In other words, there are individual differences in developmental plasticity and environmental susceptibility, where some individuals will be more affected by environmental influences, both positive and negative, than others.

In recent years, a more positive approach to developmental outcomes research has taken favour. A strengths/resilience based perspective on child welfare emphasizes a child's assets, capabilities, positive attributes, and adaptability to new situations (Helton & Smith, 2004). This approach offers a more comprehensive perspective on developmental outcomes by including an individual's personal characteristics, environment and family lives, and social functioning, rather than focusing solely on risk factors in an attempt to predict and explain differences in outcomes across individuals.

Defining resilience. Variations in the definitions of resilience exist within the field of developmental research. However, the two components that are consistent across definitions are that (1) significant risk/adversity must be present and (2) individuals are functioning "okay" despite this adversity (Masten & Powell, 2003).

Children who are placed in out-of-home care certainly meet the first requirement for resilience; they have faced a significant amount of risk and adversity in their lives. As mentioned previously, the majority of children in out-of-home care have experienced various forms of abuse and/or neglect (Courtney et al., 2013), placing them at risk for developing serious social, emotional, behavioural, cognitive, and/or physical health problems (Cicchetti & Banny, 2014; De Bellis et al., 2001; DuRoss et al., 2010).

In order to address the second component of resilience, the currently proposed research is interested in the internalizing outcomes of children in out-of-home care. Here, "functioning okay" can be defined as a lack of, or reduction in, anxiety and depression symptoms over time.

The resilience model proposed by Kumpfer (1999) provides a comprehensive overview of the major components involved in the resilience process. Kumpfer (1999)

proposes that individuals have various internal characteristics of resilience (i.e. cognitive, emotional, spiritual, physical, and behavioural) that interact with environmental risk and protective factors when an individual is faced with stress and will either result in resilience or maladaptation. This model consists of six major predictors of resilience: four domains of influence and two transactional points. The first domain is the presence of a stressor/challenge, which activates the resilience process. The second domain is the external environmental context, which is comprised of the environmental risk and protective factors (i.e. family, neighbourhood, school, and peers) that can impact socialization and either buffer or exacerbate the effect of a stressor. The third domain includes the internal characteristics of the individual: cognitive, emotional, spiritual, physical, and behavioural aspects, which may also buffer the effects of a stressor and interact with the environment to produce adaptive or maladaptive outcomes. The fourth domain is the positive outcome/successful adaptation in a specific area, which can later support adaptation in other areas. The two transactional points, the interaction between the person and environment and the resilience process itself as it is learned over time by exposure to stress, are the final components in Kumpfer's model which may influence and individual's resilience against adversity.

Proposed model. Kumpfer's model was selected because it provides a comprehensive template for resilience research, including key areas of functioning both internally and in the environment. In addition, the transactional points operationalize the complex relationships between internal and environmental factors, and how the resilience process can be reinforced over time. With relatively little research done to date on

internalizing resilience in out-of-home populations, Kumpfer's model provides a detailed framework for initial exploration in this area.

Figure 1 displays a modified version of the resilience model proposed by Kumpfer (1999). While the main structure of the model was retained, Kumpfer (1999) suggests components should be added, modified, or removed based on the outcome(s) of interest. As such, the components of our model have been selected from previously identified risk and protective factors for internalizing problems in children in both out-of-home care and community samples as well as developmental resilience research in general, while working within the constraints of the data that is currently available on a sizeable number of children in out-of-home care in the United States (i.e. data from Child and Adolescent Needs and Strengths assessments).

As cited previously, the majority of children in out-of-home care have experienced various forms of abuse and/or neglect (Courtney et al., 2013), which may act as an initial stressor in the resilience process (see Figure 1). Further, the act of being placed in out-of-home care in itself may be perceived as a stressful experience for these children and further contribute as an initial stressor in the resilience model (Goodyer, 2014).

The environmental risk and protective factors in the current study include three unmodified areas from Kumpfer's proposed model (family, community, and school functioning), two modified areas (acculturation and social functioning), and one additional area relevant to the population of interest (out-of-home placement, including placement type and adjustment in placement). These factors will be discussed in detail in Study 1.

The internal resilience components in Figure 1 include all five of Kumpfer's proposed areas of internal resilience: cognitive, emotional, spiritual, physical, and

behavioural. However, the components within each of these factors have been selected to reflect areas previously associated with internalizing outcomes and resilience research more generally. These internal factors will also be discussed in detail in Study 1.

Unlike Kumpfer's model, our model also includes three demographic factors: age, gender, and race. While these factors are generally stable over time, there is an abundance of research indicating age, gender, and racial differences in anxiety and depression disorders for children and adolescents in the general population, as well as those in out-of-home care. It is therefore important to account for these factors when examining other predictors for the internalizing symptoms of children and adolescents over time. In our model, they are included alongside the internal resilience items as they are individual characteristics that may influence internalizing outcomes for this population.

As mentioned earlier, the outcomes of interest in the current proposal, as displayed in Figure 1, are symptoms of anxiety and depression. Factors associated with lower levels of anxiety and depression can be considered protective factors, while factors associated with increased anxiety or depression are identified as risk factors in the process of resilience during children's time in out-of-home care.

Finally, the two transactional points described by Kumpfer (1999) and depicted in Figure 1 cannot be tested directly. However, the person-environment interaction will be explored in Study 1 by including all factors into a single longitudinal model. The other transactional point, the reintegration/feedback process of resilience, will be examined through the analysis of environmental and internal factors and the reciprocal nature of their relationship to internalizing symptoms as described in Study 2.

Study 1: A Comprehensive Model for Anxiety and Depression Outcomes in Children in Out-of-Home Care

The resilience model proposed by Kumpfer (1999) presents two transaction points: the person-environment interaction and the feedback process of resilience. In Study 1 we focus on the person-environment interaction within the context of a comprehensive model for the internalizing outcomes for children in out-of-home care. The studies presented previously on the risk and protective factors for internalizing problems in children in out-of-home care have explored several aspects of risk and resilience in internalizing outcomes. However, these studies all have various limitations in their approach to this topic.

First, many of the studies used cross-sectional data. While cross-sectional data is often rich in the amount of information collected from participants and less burdensome on researcher and participant's time, these types of studies are limited regarding the developmental conclusions that can be drawn from study results. Longitudinal data is particularly important in developmental studies in order to take into account the changes that might occur over time within children. For example, in their study, Stoner et al. (2015) found that the best predictors in the improvement of depression symptoms were change scores in adjustment to trauma, family functioning, sexually abusive behaviour, and school functioning, rather than these predictor's values at the first measurement. These findings suggest a dynamic nature to resilience in depression. Longitudinal data is needed in order to take into account developmental changes over time that may interact with internalizing symptoms differently than treating these predictors as static, time-invariant traits within children.

Within the longitudinal studies, the majority focused on symptoms of depression (Munson & McMillen, 2010; Orton, 2008; Stoner et al., 2015), with one looking at internalizing more broadly (McWey, Cui, et al., 2010). Anxiety symptoms in children in out-of-home care over time are largely under studied, and the frequent practice of combining anxiety and depression symptoms into a single outcome does not address the potentially unique predictors for each outcome. In examining these outcomes separately, Heneghan et al. (2013) found unique predictors for anxiety and depression in their cross-sectional models. In fact, their models showed no overlapping predictors between outcomes. This is surprising since research in community samples shows internalizing problems often have common predictors (Dooley, Fitzgerald, & Giollabhui, 2015). While children in out-of-home care may present with different predictors from community samples, evaluating separate models for anxiety and depression may provide greater insight into factors most relevant to each outcome specifically and factors that predict internalizing more generally.

Finally, these longitudinal studies have focused predominantly on risk factors related to internalizing outcomes. Within these studies, the most frequently examined risk factors were maltreatment experiences, placement type, gender, age, race, and parent mental health (McWey, Cui, et al., 2010; Munson & McMillen, 2010; Orton, 2008; Stoner et al., 2015). While efforts are made to address traumatic stress and parent mental health, the majority of these factors are not within the control of these children to change (i.e. trauma experiences themselves and factors like placement type, age, gender, and race). It is important to determine factors that can be more readily addressed through community and child welfare program planning in order to improve the lives of children in out-of-home care.

Only three studies examined protective factors for internalizing problems (Bell et al., 2013; Legault et al., 2006; Stoner et al., 2015), and only one examined these factors longitudinally (Stoner et al., 2015). These studies were also subject to various limitations. Bell et al. (2013) focused mainly on protective factors. While they did include age at removal and number of placements, they did not include other risk factors such as maltreatment experiences and traumatic stress. Legault et al. (2006) did include a measure of cumulative risk, however, they did not observe any effect for cumulative risk on anxiety. While it is possible that risk factors become less important when taking protective factors into account, it is equally possible that cumulative risk does not account for the unique contribution of the individual risk factors as they relate to anxiety symptoms. The presence of some risk factors may be more influential than others; this effect is lost when using a cumulative measure of risk. Finally, while Stoner et al. (2015) examined depression over time and included all available child functioning measures, their analysis was exploratory and not based on a theoretical model for risk and resilience. By including all possible items, the effects of true risk and protective factors may have been diluted amongst irrelevant factors. A more comprehensive, theory based, model including both risk and protective factors in separate models for anxiety and depression may provide a more complete understanding of these outcomes in children in out-of-home care. Our findings may also offer areas within children's functioning and environments that are more responsive to change in terms of program planning and interventions offered to children in out-of-home care.

The resilience framework outlined by Kumpfer (1999) was used to help select, organize, and define the internal and environmental risk and protective factors which may

be associated with changes in depression and anxiety for children in out-of-home care (see Figure 1). While factors were selected based on previous research, and organized within a theoretical framework, the novelty of this comprehensive model makes this study somewhat exploratory in nature. In addition, the model was limited by the data that is already being collected and available for research from children in out-of-home care in the United States (i.e. Child and Adolescent Needs and Strengths assessments). The proposed model will be evaluated in the current study, with the relevant risk and protective factors discussed in detail below.

Environmental Factors

Risk factors are those that predict greater negative or undesirable outcomes, while protective factors are those that are correlated to better outcomes in the presence of adverse conditions (Masten & Powell, 2003). While risk and protective factors are often presented separately in research, they will be presented together here; organized into six main areas within the environmental factors domain presented in Figure 1. Risk and protective factors can be thought of as opposite poles on a continuum. For example, a child who does not participate in extracurricular activities may be at greater risk of depression, while another child heavily involved in extra curricular activities may be protected against the depressive outcomes they might face as a result of being placed in out-of-home care. Further, in regression analyses risk and protective factors are all treated as predictor variables regardless of how they are theoretically classified.

Kumfer (1999) originally proposed five main areas of environmental risk: family, culture, community, school, and peers, but notes that these factors will vary depending on the field of study. These factors are meant to represent the potential areas that could

contribute to a high-risk environment. Kumpfer (1999) describes resilient youth as those that are able to find micro-niches of support within these environments. In order to identify the environmental risks and supportive/protective areas for internalizing outcomes we modified Kumpfer's environmental domains to include: family, acculturation (instead of culture), community, placement (added to reflect population of interest), school functioning, and social functioning (modified from peers). These domains are comprised of one or more sub-factors, and will be discussed in detail below.

Family. For our outcomes of interest, two main aspects of family will be investigated. First, family functioning in general can provide a risk or protective effect towards internalizing problems in children. Second, many children in out-of-home care have experienced abuse/neglect/or other traumatic experiences while under the care of their biological families (Courtney et al., 2013) and should be taken into consideration for fostering a high-risk environment which could contribute to increased internalizing problems. While the influence of foster families is important to the emotional well-being of children in foster care (Bell et al., 2013), not all children in this sample were in foster placements. In order to examine factors relevant to all children in out-of-home care, the current study focuses on family functioning as it relates to biological family or family as defined by the child.

Family functioning. Over the years, various aspects of family have been linked to internalizing symptoms for children and adolescents in out-of-home care. Stoner et al. (2015) found that improvement in family functioning (i.e. child gets along well with family members) was the second best predictor for improvement in depression symptoms in a sample of 228 children and adolescents 4 to 20 years old in United States foster care.

Similarly, Bell et al. (2013) found that parenting characteristics (i.e. ineffective parenting and positive parenting) accounted for 1.4% of additional variation in children's emotional problem outcomes (as measured by five items on the SDQ) in a sample of 531 children aged 5 to 9, residing in out-of-home care in Canada. However, parenting behaviours and outcomes were assessed using self-report measures from children's foster caregivers, not from their biological parents. Finally, in a sample of 145 adolescents 11 to 17 years old in a residential facility for maltreated youth in the United States, Kaur and Kearney (2013) found that less family cohesion (as measured on a 90 item self-report inventory) was a significant predictor of self-reported depression symptoms (on the CDI) and post traumatic stress disorder (PTSD) symptoms. While the relationship between children and out-of-home caregivers may be an important factor in internalizing symptoms for these children (Guibord, Bell, Romano, & Rouillard, 2011; Legault et al., 2006), the current study will focus on the relationship between children and their biological or adoptive families and relatives. The relationships between children and their out-of-home caregivers are difficult to measure, particularly in longitudinal samples, as relationships are often temporary due to staff turnover and children's placement changes.

Although children in out-of-home care may not have daily contact with parents or other family members, there is some evidence that visitation with family has an effect on symptoms of depression. In a sample of 362 children aged 7 to 15 residing in out-of-home care with Child Protective Services across the United States, McWey, Acock, and Porter (2010) found a marginally significant ($p < .10$) effect for frequency of contact with mother on depression scores, where more frequent contact was associated with lower depression scores in these children. However, after taking into account the effect of gender, where

females had higher depression scores than males, maternal contact no longer had an effect on depression. From these findings it appears that contact alone is not necessarily an important factor in the depression levels of children in out-of-home care. It appears a strong, supportive relationship with family and the parenting behaviours of out-of-home caregivers may be more important than frequent contact with biological parents.

The only study that examined anxiety scores and aspects of family combined anxiety and depression symptoms into a single measure of emotional problems (Bell et al., 2013). This study also measured parenting behaviours of out-of-home caregivers, rather than the relationship children had with their biological family. However, research in community samples suggests family functioning may be equally relevant to anxiety, as is seen in depression. In a community sample of 6,085 Irish adolescents, Dooley et al. (2015) found greater family cohesion predicted both lower anxiety and depression scores. They also found that perceived criticism from parents predicted greater anxiety and depression. There do not appear to be any studies examining anxiety outcomes alone for children or adolescents in out-of-home care, however the above review suggests family functioning may have an effect on both anxiety and depression levels for these children.

Trauma/maltreatment. The trauma and maltreatment items are included within the family domain because the majority of maltreated children and youth have been victimized by an adult family member. In a nationally representative sample of 2,030 2 to 17 year olds, Finkelhor, Ormond, Turner, and Hamby (2005) found that 77% of maltreatment cases (physical, sexual, and psychological abuse, neglect, and family abduction) were perpetrated by a member of the family and 90% of cases were perpetrated by an adult.

The number and type of maltreatment and other traumas children experience may impact how these children experience internalizing problems and mental health more generally. The effects of trauma/maltreatment on internalizing problems in child welfare populations may be the most frequently studied relationships in this area (Heneghan et al., 2013; Kennedy, Bybee, Sullivan, & Greeson, 2009; McMillen et al., 2005; Munson & McMillen, 2010; Orton, 2008; Rosenberg et al., 2014; Tonmyr et al., 2011). Despite the large amount of research in this area, there is little consensus across studies between which types of maltreatment/trauma are related to increased anxiety and depression.

Tonmyr et al. (2011) found elevated anxiety and/or depression in children who experienced emotional maltreatment, sexual abuse, and neglect. However, they did not observe any effects for physical abuse or exposure to family violence. And Heneghan et al. (2013) found that adolescents whose primary maltreatment was classified as physical or sexual abuse reported significantly more depression (on the CDI) and suicidality compared to children who experienced neglect or other forms of maltreatment. Further, their results did not indicate any maltreatment type to be related to anxiety. While sexual abuse was a significant predictor in both studies, results regarding physical abuse and neglect were discrepant.

Other studies have examined the cumulative effects of different forms of maltreatment on child psychiatric disorders, but they did not include anxiety among the disorders investigated (McMillen et al., 2005; Rosenberg et al., 2014). Further, trajectory research has found that certain types of maltreatment, and cumulative maltreatment, are associated with different trajectories over time for symptoms of depression (Munson & McMillen, 2010; Orton, 2008).

Few longitudinal studies have examined maltreatment in relation to anxiety symptoms other than traumatic stress. However, Kennedy, Bybee, Sullivan, and Greeson (2009) examined anxiety symptoms over time in 100 children (8 -12 years old) who had witnessed intimate partner violence, community violence, and school violence. These researchers found that intimate partner violence and child anxiety symptoms were correlated ($r = .22$ to $.28$ across time points) and that both decreased over time. This relationship was moderated by family social support, where increased support was associated with reduced anxiety even when children continued to report high rates of witnessing violence. These results suggest that the association between maltreatment and anxiety/internalizing as observed by Tonmyr et al. (2011) also holds over time, similar to the trajectory research in depression.

Overall, the above studies show a great deal of variability in the types of maltreatment/trauma associated with depression and anxiety in child welfare samples. The diverse findings may be, in part, due to the diverse methods used as these studies varied greatly in their samples (i.e. child welfare involved, out-of-home, or at-risk), the way maltreatment/trauma was classified, and how internalizing symptoms were measured. However, the findings still provide evidence that trauma/maltreatment should be included as environmental factors when examining anxiety and depression in children in out-of home care.

Acculturation. While racial differences are commonly taken into account in psychological research, a similar concept that is less often examined are the effects of an individual's culture or acculturation experiences. Kumpfer (1999) includes culture as part of the environmental risk and protective factors that can contribute to a high-risk or

supportive environment. While culture may be an important component to the environment of a community-based population, for children in out-of-home care, acculturation may be a more specific and relevant aspect as it pertains to the way an individual integrates their own culture with the dominant culture in society (Yeh, 2003). This may be of particular importance when researching the internalizing problems of children in out-of-home care as acculturation difficulties can arise, not just in the community/school environment as most acculturative stress, but in a child's out-of-home placement as well.

In non-child welfare samples several aspects of acculturation have been linked to anxiety and depression symptoms, as well as other mental health problems (Sam, 2000; Yeh, 2003). In child welfare samples, there is less consistency regarding a link between acculturation and internalizing problems. Anderson and Linares (2012) examined cultural dissimilarity and depression, among other adjustment indicators, in a sample of 106 ethnic minority children (aged 7 to 15) in foster care in the United States. They found that the amount of cultural dissimilarity between foster parents and foster children (i.e. ethnicity, country of birth, and spoken language) predicted children's depression scores on the CDI. However, Kaur and Kearney (2013) did not find ethnic identity (i.e. positive ethnic attitudes and sense of belonging, ethnic identity achievement, ethnic behaviour and practices, and other group orientation) to be related to depression scores on the CDI. Their sample of 145 adolescents 11 to 17 years old was selected from a residential facility for maltreated youth in the United States. Anderson and Linares (2012) and Kaur and Kearney (2013) differ in several ways. One study population was comprised of foster children while the other was comprised of children in residential care. Further they each examined a

distinctive aspect of acculturation, which makes it difficult to compare their results. Neither study examined anxiety symptoms as they relate to acculturation. To date, few studies have examined the role of acculturation in the internalizing problems for children in out-of-home care. However, there is preliminary evidence that difficulty adapting to a new culture via foster placement may have a negative effect on depression and anxiety symptoms for these children.

Community. Kumpfer (1999) includes community as one of the general environmental risk and protective factors that can contribute to a high-risk or supportive environment. *Community involvement* can be described as the degree to which an individual is involved in the cultural/social aspects of the community in which they live. In the general population community involvement has been associated with decreases of internalizing symptoms in children. Caughy, Nettles, and O'Campo (2008) found that a negative social climate (characterized by poor neighbourhood conditions, drug and gang presence, and fear of victimization) was associated with greater internalizing problems in a community sample of 405 children entering the first grade in a major U.S. city. They also found that potential for community involvement (i.e. willingness of community members to assist and intervene on behalf of the child) had a moderating effect on internalizing problems, where impoverished neighbourhoods had less of a negative effect on internalizing problems if community involvement was high.

In at-risk and child-welfare samples, the relationship between community and internalizing problems may be complex. Rosenberg et al. (2014) found the resilience subscale of involvement moderated the relationship between self-reported trauma and depression, where increased involvement in extracurricular and community activities

lessened the effect of trauma on depression, in 350 Juvenile Justice involved adolescents. Also, in a sample of 93 emerging adults (18 to 25 years old) transitioning out of the child welfare system, Goldstein, Faulkner, and Wekerle (2013) found self-reported resilience, defined as stress-coping ability, to be positively correlated to self reported religious ($r = .27$, $p < .05$) and community involvement ($r = .23$, $p < .05$), and negatively correlated to self-reported depression scores ($r = -.33$, $p < .01$). While the relationship between depression and community involvement was not examined directly, this study provides additional support of a possible link between community involvement and depression via resilience in older youth exiting the child welfare system. Similarly, Quisenberry and Folts (2013) found that positive development (i.e. self reported belongingness, mastery, independence, and generosity) was correlated to self-reported community involvement/connectedness ($r = .49$, $p < .01$) for 42 youth aged 13 to 18 in residential care. None of the above studies examined the relationship between community involvement and anxiety in child-welfare samples. However, if results are similar to those few studies that have examined depression in relation to community involvement, we might expect community to be associated with lower anxiety levels along with depression.

Placement. Although not included among Kumpfer's (1999) originally proposed environmental factors, placement is an important part of the environment for children in out-of-home care. In comparison to children in foster care settings, children in residential placements appear to have greater mental health problems (including anxiety and depression), behaviour problems, and lower quality of life (Baker, Kurland, Curtis, Alexander, & Papa-Lentini, 2007; Damnjanovic et al., 2011; Keller, Salazar, & Courtney, 2010). It appears that placement type is related to the trajectories of self-reported

depression symptoms as well. In 404 youth 17 to 19 years old exiting the US child welfare system, Munson and McMillen (2010) found that the class trajectory where symptoms started high and decreased over time was largely comprised of youth exiting the child welfare system from residential type settings, while the class with low but increasing depression over time was comprised of more youth living independently. It appears that placement type is related to internalizing outcomes and mental health in general, as well as the depression trajectories of children in out-of-home care.

However, other research indicates placement type has no bearing on anxiety and depression for children in out-of-home care. Heneghan et al. (2013) did not find placement type to significantly predict anxiety or depression scores in a sample of 815 adolescents. However, the lack of findings may have been due to the sample being largely comprised of children investigated for maltreatment but remaining in their homes (83% of the sample). They did find that those who had experienced out-of-home placements were 2.3 times more likely to report a mental health problem when examining all 5 outcomes (i.e. anxiety, depression, suicidality, substance use, and ADHD) collectively, suggesting a change in living situation is associated with increased internalizing and mental health problems.

Other placement-related factors have also been associated with aspects of child mental health. Some studies have found placement instability, or frequent placement changes, to be related to mental health problems for children in out-of-home care (Fawley-King & Snowden, 2012; Koh, Rolock, Cross, & Eblen-Manning, 2014). However, when looking specifically at internalizing problems, there is less support for a connection to placement change. Bell et al. (2013) did not find an effect for age at first placement or number of placements on emotional problems in a sample of 531 children in out-of-home

care in Canada. The lack of findings here may have been due to the cross-sectional research design. The studies above that found a connection between placement changes and mental health used longitudinal data.

Thus far, no studies exist examining anxiety symptoms alone in relation to placement changes. However, the above studies lead us to expect a relationship between placement type/number of placements, and internalizing problems and should be taken into account when evaluating environmental risk.

School Functioning. Kumpfer (1999) includes school as one of the general environmental risk and protective factors that can contribute to a high-risk or supportive environment, and school functioning may be an important protective factor for children in out-of-home care. Compared to the general population, children in out-of-home care appear to have greater difficulty in school. In a sample of 193 children (7 to 15 years old) in out-of-home care in Britain, Rees (2013) found that approximately 67% of children had lower reading and spelling scores than national British norms, based on their cognitive functioning and age. This difficulty may be due, in part, to removal from the home since children may not be placed in the same school zone causing disruptions to school attendance and learning. And for children in out-of-home care, school functioning is related to positive overall development (Quisenberry & Foltz, 2013).

There is evidence that school functioning is related to mental health and internalizing symptoms for children in out-of-home care. As mentioned above, Stoner et al. (2015) found improvements in school functioning on the CANS to be the fourth and final significant predictor of improvement in depression symptoms in a sample of 228 children and adolescents (4 to 20 years old) in foster care in the United States. Similarly, using an

earlier version of the CANS, Lyons et al. (2000) found that school/vocational strength was negatively correlated to psychological symptoms ($r = -.24, p < .01$) in 450 children and adolescents (5 to 19 years old) in residential care in the United States. While evidence supports a connection between general mental health, depression, and school functioning in out-of-home samples, there is a lack of studies regarding anxiety symptoms and school performance for children in out-of-home care. However, research from community samples suggests there may be a link between school performance and anxiety. In a sample of 478 children, 8 to 16 years old in Italy, Mazzone et al. (2007) found significantly more children had poorer grades in the anxious group compared to their non-anxious counterparts. Based on these results, the connection between school functioning and anxiety in children in out-of-home care warrants further exploration.

Social Functioning. The final environmental factor in our model is social functioning. Kumpfer (1999) includes peers as one of the environmental risk and protective factors that can contribute to a high-risk or supportive environment. However, for children in-out-of-home care, social functioning more generally (including both peers and adults) may be a more relevant factor since these children have to maintain both peer and adult relationships (e.g. foster families, social workers) when removed from their homes.

There is a fair amount of evidence that poor social functioning is related to anxiety and depression disorders in the general population (La Greca & Harrison, 2005; Settapani & Kendall, 2013). For children in out-of-home care, understanding how social functioning might impact future internalizing symptoms and response to treatment is particularly important as many children in contact with child welfare have difficulty forming and

maintaining healthy social relationships (Bolger, Patterson, & Kupersmidt, 1998). Further, for children in residential care, positive development is related to peer resilience (Quisenberry & Foltz, 2013).

However, there is relatively little research examining the impact of social functioning and friendships on internalizing symptoms for children in out-of-home care. Legault et al. (2006) found that adolescents perceived relationships with friends predicted anxiety levels in a sample of 220 adolescents in out-of-home care in Ontario, Canada. In their regression model of factors predicting self-reported anxiety scores, the addition of the child's perceived relationship with friends explained an additional 17% of the variance in anxiety scores. However, Bell et al. (2013) did not find an effect of pro-social behaviour on the emotional problems of 531 children in out-of-home care in Canada. It is possible that the difference in findings is due in part to the age difference between study samples, where Bell et al. (2013) examined a sample of children 5 to 9 years old while Legault et al. (2006) examined a sample of 14 to 17 year olds. It is possible social relationships are more important for older youth in out-of-home care than younger children. Regardless, overall it appears that social functioning and peer relationships provide a protective effect against anxiety and depression symptoms in children and adolescents in general, and possibly in out-of-home samples as well. Therefore, social functioning should be included as a possible environmental risk/protective factor when examining these outcomes in children in out-of-home care in order to consider all aspects of the environment.

Internal Factors

Kumpfer (1999) describes internal resilience as the cognitive, emotional, spiritual, physical, and behavioural strengths needed to be successful on various tasks within the

environment. While Kumpfer focuses mainly on protective factors, our internal factors include both risk and protective factors as internalizing problems are related to various internal strengths and deficits. Without examining the role of internal risks, the role of internal protective factors may be over-estimated. As with the environmental factors, the internal sub-factors included here have been selected based on their relation to internalizing problems in both community and out-of-home research. The five main areas of internal risk/resilience (cognitive, emotional, spiritual, physical, and behavioural), and how they relate to the internalizing outcomes of children in out-of-home care, will be outlined below.

Cognitive. Kumpfer (1999) describes cognitive competencies to include abilities that help a person achieve their goals, such as intelligence, moral reasoning and creativity. Similar to intelligence and creativity, the ability to identify and enjoy various talents/interests may have a protective effect for internalizing outcomes. And while Kumpfer (1999) includes optimism under the spirituality domain, it is included here as a cognitive strength.

Talents/interest. There is some evidence that children and adolescents fare better in out-of-home care when they have specific talents or skills in such areas as arts, theater, athletics, or music. Gillian (1999) presents a series of case studies of children in out-of-home care who found personal talents/interests with the help of child welfare workers and caregivers. These interests included areas such as dance, school choir, visual arts, caring for domestic animals, and sports. Caregivers and welfare workers credited these interests to improvements in various areas of their functioning, such as self-esteem, academic performance, emotional well-being, social skills, and employment. While the activities

themselves provided benefits to the children, it was also presumed that the connections with peers and adults who were not a part of the social welfare community appeared to benefit these children by providing them with sources of support and strength they could carry with them after they left the child welfare system.

The small amount of quantitative research that exists in this area does not support the qualitative case examples above. Using an earlier version of the CANS, Lyons, Uziel-Miller, Reyes, and Sokol (2000), mentioned earlier, found that extra-curricular strengths (i.e. talents, hobbies, and sports) was one of the few child strengths that was not associated with mental health symptoms, risk behaviours, or functioning in a sample of 450 children and adolescents 5 to 19 years old in residential care in the United States. Although there is little investigation into the effects of talents, interests, and hobbies on the internalizing outcomes for children in out-of-home care, the observations from Gillian (1999) suggest there may be an unexplored protective effect for these types of activities in out-of-home care populations.

Optimism. In community samples, optimism has been associated with lower depression and anxiety. In a community sample of 172 children aged 9 to 14 in Ontario, Keyfitz, Lumley, Hennig, and Dozios (2013) found that self-reported positive schema (a construct which includes optimism) was moderately negatively correlated to lower self-reported depression scores ($r = -.64$) and weakly negatively correlated to lower self-reported anxiety scores ($r = -.20$). They also found that positive schema accounted for an additional 28% of variance in depression scores after controlling for sex and negative schema. And it accounted for an additional 2% of variance in anxiety scores after controlling for sex and negative schema. Similarly, in a longitudinal community sample of

4,036 children from grades 6 to 8 from two economically disadvantaged counties in the United States, researchers found that for every one unit increase in future optimism, there was a 2% decrease in self-reported internalizing scores on the YSR (Smokowski et al., 2014). Similar results are also seen in adolescent samples. Dooley et al. (2015) found that optimism predicted both lower self-reported anxiety and depression in a sample of 6,030 adolescents 12 to 18 years old. There is sufficient evidence here to indicate a link between optimism and both anxiety and depression in community samples.

However, little research exists on the relationship between optimism and internalizing problems for children in out-of-home care. In the study by Bell et al. (2013), the internal assets subscale from the Developmental Assets Scale was negatively correlated to emotional problem outcomes ($r = -.22$). The internal assets subscale included an item to measure future optimism (Scales, 1999). However, despite a significant correlation between measures, internal assets did not predict emotional problem outcomes in this sample. While these findings provide mixed support for a relationship between optimism and internalizing outcomes for children in out-of-home care, research in community samples suggest there may be a protective effect not yet explored for out-of-home populations.

Emotional. The emotional factors identified by Kumpfer (1999) include those associated with resilient functioning, such as happiness (vs. depression), emotional regulation, self-esteem, and humour. In our model, the inclusion of both anxiety and depression in relation to one another is important, as internalizing problems are frequently comorbid. In addition, the ability to manage traumatic events is an important factor for children in out-of-home care since they have likely experienced significant adversity.

Co-occurring anxiety/depression. When examining anxiety and depression outcomes individually, it is important to take into account the common comorbidity between these two internalizing problems. In a review of community based research, Axelson and Birmaher (2001) found that for depressed youth, approximately 25 to 50% have comorbid anxiety, and for anxious children and adolescents approximately 10 to 20 % have comorbid depression.

In out-of-home samples comorbidity rates between depression and anxiety may be even higher than those seen in community samples. In a sample of 92 female adolescents in residential treatment in The Netherlands, Leenarts et al. (2013) found a Pearson's correlation rate of .8 between self-reported depression and anxiety. This study examined the effects of trauma and posttraumatic stress disorder on several mental health and behaviour problems, as will be discussed in the section below. Similarly, Meltzer et al. (2002) examined mental health problems in a sample of 1,039 children 5 to 17 in out-of-home care in England. The data collected was based on interviews with caregivers, teachers, and the children themselves. They found that any anxiety and any depressive episode frequently co-occurred with an odds ratio of 55.08, indicating children are about 55 times more likely to have both anxiety and depression than either disorder alone. Considering the rates above, it is important to include each disorder as a predictor when modeling the outcomes of the other, in order to control for this observed comorbidity.

Traumatic stress. Traumatic stress is often measured by evaluating symptoms of posttraumatic stress disorder (PTSD). Children in out-of-home care often experience traumatic events prior to being placed in care. The rates of PTSD in this population appear to be higher than in that of the general population. In a sample of 732 older adolescents (17

to 18 years old) exiting the child welfare system in the United States, Keller, Salazar and Courtney (2010) found that 15% of adolescents met diagnostic criteria for PTSD, while rates of approximately 5% were found in a community sample of 904 adolescents 13 to 18 years old in the United States (R. C. Kessler et al., 2012). Further, PTSD is correlated to depression and other forms of anxiety in children in out-of-home care settings. Depending on the study, the correlation rates between PTSD and depression range from .56 to .72 (Leenarts et al., 2013; Rosenberg et al., 2014). The correlation between PTSD and other forms of anxiety appears to be a bit lower ($r = .29$) than the rates for depression (Leenarts et al., 2013). However, this relationship has been less studied.

These relationships appear to be more than just correlation, as Stoner et al. (2015) found that an improvement in adjustment to trauma (on the CANS) was the best predictor for improvement in symptoms of depression over time for 228 children and adolescents (aged 4 to 20) in the U.S. foster care system, compared to all other indicators of functioning included in their analyses. Other longitudinal research also shows a connection between traumatic stress and internalizing problems for children in out-of-home care over time. In a piecewise growth analysis, Valdez, Bailey, Santuzzi, and Lilly (2014) found depression tended to decrease across the first year, and increase across the second. Further, increased PTSD and emotional dysregulation predicted higher initial depression levels as well as steeper decreasing depression in the first year, while increased PTSD also predicted increasing depression in the second year. However, other longitudinal research shows a different relationship of traumatic stress to internalizing symptoms more generally. In a sample of 155 children in-out-of home care in the United States, age 11 to 15, Rayburn, McWey, and Cui (2016) found that traumatic stress and internalizing both decreased

across the three year study, and decreases in traumatic stress were significantly associated with decreases in internalizing symptoms. One major difference in these studies is that Valdez et al. (2014) only measured PTSD and emotional dysregulation at the beginning of the study, while Rayburn et al. (2016) treated both traumatic stress and internalizing symptoms as time-varying. From these findings, it appears that traumatic stress should be considered as a time-variable construct in relation to depression and internalizing symptoms over time for children in out-of-home care.

Spiritual. The spiritual domain described by Kumpfer (1999) includes a diverse set of characteristics thought to be involved in spirituality and motivation, such as existential meaning, spirituality, perseverance, and optimism. As mentioned, optimism is included in our cognitive domain, as we will focus on a more direct sense of spirituality in the current domain.

Spirituality/religiousness has shown a relationship to internalizing problems in community samples. In a meta-analysis of 147 studies (N = 98,975), Smith, McCullough, and Poll (2003) found a small negative relationship between depression and religiousness ($r = -.096$), indicating greater religiousness was associated with lower depression. A smaller, but still significant effect ($r = -.067$) was seen when examining the 10 adolescent-specific studies alone (N = 6,029). Similarly, Schottenbauer, Spernak, and Hellstorm (2007) found that parent-reported internalizing behaviours were negatively correlated to family attendance at religious/spiritual programs ($r = -.05$) and parent prayer/meditation ($r = -.07$), in a community sample of 7,515 grade three children (approximately 8 to 9 years old) from across the United States. Further, in a hierarchical regression, the authors found family religious attendance predicted internalizing behaviours beyond parenting style and

parent prayer/mediation. These results suggest that, in children, the association between religiousness and internalizing problems may have more to do with the social aspect of attending religious functions than simply holding religious beliefs.

Similar findings have been seen in out-of-home care samples as well. Makanui (2012) examined spirituality and mental health in a sample of 159 youth aged 8 to 21 in foster and residential care in the Midwestern United States. They did not find a significant correlation between self-reported spiritual beliefs/practices and self-reported internalizing scores (on the Behaviour Assessment System for Children). However, there was a significant negative correlation between "relationship with others" - defined as a moral/spiritual influence on interacting with others (e.g. trusting others, being nice, apologizing, forgiveness) - and internalizing scores ($r = -.26, p < .01$). These results are similar to those from Schottenbauer et al. (2007) in that they suggest the social aspect of religion/spirituality is what affects internalizing symptoms, rather than the holding of religious beliefs on their own. Other research provides some evidence that spiritual beliefs, and not just the social aspects of spirituality, may be linked to internalizing problems in children in out-of-home care. Lyons et al. (2000) found that moral/spiritual strength was negatively correlated with psychological symptoms in a sample of 450 children and adolescents 5 to 19 years old in residential care in the United States. Using an early version of the CANS, moral/spiritual strength was defined as having developed morals, expressing religious beliefs, attending religious services, and participating in youth groups. This moral/spiritual strength was mildly negatively correlated to psychological symptoms, which include internalizing problems ($r = -.27, p < .01$). As this definition of spirituality includes both the spiritual/faith aspect as well as the social component to religion, and the

psychological symptoms examined are not exclusively related to internalizing problems, it is not entirely clear how religion/spirituality might affect the internalizing outcomes of children in out-of-home care. However, this study does provide preliminary evidence for an inverse relationship between spirituality and internalizing problems.

Physical. Kumpfer (1999) relates several areas of physical well-being to resilient functioning, such as good health, health maintenance (i.e. exercise and diet), and physical skill development. In our model, we include physical health and recreation as factors in the physical domain because these two aspects of children's' physical well-being have been linked to internalizing problems for children and adolescents in out-of-home care as well as community samples.

Recreation. Participation in extra curricular and leisure activities has shown to be a protective factor against depression for children in out-of-home care. Guibord et al. (2011) found that self-reported participation in extracurricular activities was a protective factor against depression for 122 adolescents aged 12 to 15 in out-of-home care in Ontario. Using logistic regression they found that for every one-unit increase in extracurricular activities there was a 56% decreased chance of experiencing depression or substance use. Results from Rosenberg et al. (2014) also provide some evidence that extracurricular activities have a protective effect against depression. In a sample of 350 Juvenile Justice involved youth, 11 to 17 years old, who were incarcerated, living in residential treatment facilities, or appearing before family court, researchers found that self-reported involvement moderated the relationship between trauma and depression, where increased involvement in extracurricular and community activities lessened the effect of trauma on depression.

Being involved in recreational activities appears to provide some protective effects against depression for adolescents in out-of-home care or those that have experienced trauma.

The limited research examining the relationship of extra curricular activities to symptoms of anxiety in out-of-home care is mixed regarding any protective effect. There is however, evidence from adolescents in residential treatment that suggest exercise can reduce symptoms of PTSD, depression, and anxiety. Newman and Motta (2007) examined treatment outcomes in a small sample of 11 female adolescents aged 14 to 17 diagnosed with PTSD from a residential treatment center in the United States. Girls that participated in moderate intensity group exercise for 40 minutes, 3 times a week for 8 weeks showed significant reductions in self-reported PTSD, depression, and anxiety symptoms from pre- to post intervention. These results provide some preliminary evidence that participation in organized group exercise may improve internalizing symptoms for children in out-of-home care. However, using an earlier version of the CANS, Lyons et al. (2000) did not find a significant correlation between extracurricular strengths and psychological symptoms (which include internalizing problems) in a sample of 450 children and adolescents 5 to 19 years old in residential care in the United States. It is not yet clear whether extracurricular and recreational activities are an important protective factor for both anxiety and depression in children in out-of-home care. However, the studies presented above suggest anxiety and depression may decrease with increased recreational activity. Additional research using anxiety and depression as discrete outcomes is needed in order to better understand when and how recreational activities might affect internalizing symptoms for children and adolescents in out-of-home care.

Health. Physical and developmental disabilities have been linked to increased depression for children in contact with the child welfare system. In a study of 675 youth aged 11 to 17 whose families had been investigated for maltreatment by the United States child welfare system (where children remained with their families), researchers examined depression scores between youth with and without physical and neurodevelopmental disabilities (Berg, Shiu, Msall, & Acharya, 2015). They found that youth with disabilities (n = 247) were more than twice as likely to report clinical levels of depression (on the CDI) compared to non-disabled peers (n = 428). Further, after controlling for other factors, the odds of reporting clinical levels of depression were nearly four times higher for the youth with disabilities (OR = 3.97). The researchers also found that, for youth with disabilities, the level of victimization the youth experienced affected depression scores, where increased victimization predicted greater levels of depression. Although these youth were not in out-of-home care, many of them had experienced victimization. We might similarly expect that having a disability would put children in out-of-home care at greater risk of depression.

Medical illnesses have also shown to be risk factors for internalizing problems for children in out-of-home care. In a sample of 188 children (11 to 16) in out-of-home care in the United States, children with a chronic health condition (e.g. asthma, diabetes, sickle cell anemia; n = 50) had greater self-reported and parent-reported internalizing problems (on the YSR and CBCL respectively) compared to children without a chronic health condition (Woods, Farineau, & McWey, 2013). Similarly, Nelson et al. (2012) found that internalizing scores were associated with having a physical health problem in a sample of 606 youth 8 to 18 years old from a residential treatment center in the United States. Physical health

conditions included those conditions outlined in the International Classification of Disease-10 (excluding obesity, allergies, and acne due to high prevalence rates) and internalizing symptoms were evaluated using the internalizing subscale of the CBCL parent and child versions. From logistic regression, internalizing symptoms predicted physical health problems where the odds of having a health problem were 1.3 times greater if the youth had an internalizing problem. Subsequent analyses revealed that anxiety was the only CBCL internalizing subscale that significantly predicted having a physical health problem (OR = 1.41). Unlike in Woods et al. (2013), the affective problems (i.e. internalizing problems) subscale did not significantly predict physical health conditions. However, taken together, these two studies provide evidence that physical health problems may affect both anxiety and depression levels for children in out-of-home care.

Behavioural. The behavioural factors outlined by Kumpfer (1999) include characteristics that involve actions rather than just thoughts, such as social skills, communication skills, talents, and capacity for intimacy. In our model, we include social skills under the social functioning environmental domain, and talents within the cognitive domain. The behavioural domain in Figure 1 includes externalizing problems and substance abuse problems. Although both are considered risk rather than protective factors, these two factors have shown association to internalizing problems in the general population as well as children in out-of-home care.

Externalizing problems. Internalizing and externalizing problems are frequently comorbid in children in out-of-home care. Comorbidity rates have been found between 10% to 63% depending on the out-of-home samples and diagnostic criteria used (McMillen et al., 2005; Williams & Harper, 1979). Similarly, correlation rates between .57 to .71 for

internalizing and externalizing symptoms have been seen in adolescent foster care samples (McWey, Cui, et al., 2010). Since comorbidity rates of internalizing and externalizing problems are fairly high among children and adolescents in out-of-home care, it is important to understand how externalizing disorders might affect the symptom trajectories for depression and anxiety over time for these children. Munson and McMillen (2010) found that youth with a history of disruptive behaviour disorder were overrepresented in the increasing and decreasing depression classes, compared to the never depressed class trajectory in 404 adolescents in the US foster care system. They modeled self-reported depression across two years and found that 75% of youth in the decreasing depression class and 72% of youth in the increasing depression class had histories of disruptive behaviour disorder, compared to 38% in the never depressed class. However, this study included externalizing problems as a time stable factor and did not assess behaviour problems at each time point. Therefore, we do not know whether children in the increasing and decreasing depression trajectories continued to exhibit behaviour problems across the two assessment years. While no studies have investigated the relationship between anxiety and externalizing problems longitudinally for children in out-of-home care, community based research provides some evidence that externalizing problems predict future anxiety problems. In a sample of 1,580 Dutch children 4 to 16 years old, Roza, Hofstra, van der Ende, and Verhulst (2003) examined the 14 year adult outcomes of mood and anxiety disorders based on childhood behavioural and emotional problems. Childhood problems were assessed using the Child Behaviour Checklist and adult diagnostic status was determined using the Composite International Diagnostic Interview. Researchers found that the childhood externalizing scale was a significant

predictor of adult anxiety disorders and externalizing also predicted anxiety disorder onset independent of childhood internalizing scores. The same pattern was not seen for adult mood disorders; only the anxious/depressed subscale of the CBCL predicted adult mood disorders. Taken together, these studies provide support for the effect of externalizing problems on future anxiety and depression symptoms for children in the general population as well as those in out-of-home care.

Substance use. Substance use and internalizing problems often co-occur in out-of-home adolescent samples. For example, Rosenberg et al. (2014) used a web based self-reporting tool to evaluate symptoms of trauma, depression, substance use, and resilience in a sample of 350 Juvenile Justice involved adolescents (11 to 17 years old). They found that comorbidity among PTSD, depression, and substance use was high, where 49% of the sample was identified as having two or more disorders, and 26% of adolescents were identified as having all three disorders.

There is evidence that depression levels can affect substance use outcomes for children and adolescents. In a sample of 40 adolescents aged 15 to 19 in a secure residential treatment program for substance abuse and co-occurring depression in the United States, Boger et al. (2014) found that self-reported depression and anhedonia decreased during the course of treatment. However, self-reported symptoms of anxiety did not. While these researchers did not find anxiety changed with substance abuse treatment, research in children with anxiety disorders shows that successful treatment of anxiety can affect future substance use. In a sample of 86 adolescents 15 to 22 years old who had previously completed cognitive behaviour therapy for an anxiety disorder when they were between the ages of 9 and 13, researchers found that post-treatment anxiety diagnostic

status was predictive of substance use related symptoms (Kendall, Safford, Flannery-Schroeder, & Webb, 2004). While having an anxiety diagnosis at post-treatment did not predict a diagnosis of substance use disorder, those adolescents that still had a primary anxiety disorder diagnosis at post-treatment (or at long term follow-up approximately 7 years later) had reported more drinking days per month, were more likely to use marijuana, were more likely to have negative physical, psychological, and social difficulties resulting from drug use, and to have used larger amounts of drugs compared to adolescents whose anxiety disorder was no longer a primary diagnosis after treatment or at follow-up. There is also research indicating depression similarly affects successful outcomes in the treatment of substance abuse problems. Subramaniam et al. (2007) found that increased symptoms of depression can negatively affect successful treatment of substance abuse problems for adolescents receiving residential treatment. There is also evidence that levels of substance abuse may affect the trajectories of depression symptoms over time. Munson and McMillen (2010) found that substance use at 17 was related to being in their increasing depression class trajectory, compared to the other two classes (decreasing, low/stable). From the above studies, it appears that substance use and internalizing problems have a complex, bidirectional relationship for adolescents in out-of-home care. Substance use is therefore an important factor to take into consideration when examining the internalizing symptoms of children and adolescents in out-of-home care over time.

Demographics

Although not included in Kumpfer's (1999) model, they do acknowledge gender differences in developmental resilience. In addition, race/ethnicity and age effects are often observed when examining internalizing problems over time. Therefore, these demographic

factors should be included when examining internalizing symptoms in children and adolescents in out-of-home care.

Gender. As in the general population, research in out-of-home samples show that being female puts children and adolescents at greater risk for internalizing problems. This is observed in many of the studies referenced above. Orton (2008) found gender differences in the growth trajectories of children's self-reported depression symptom scores among 2,302 children whose families had been investigated by the United States child welfare system for maltreatment (aged 7 to 14). They found that at approximately age 8 girls begin to have consistently higher depression scores than boys. However, these children were not necessarily in out-of-home care. Munson and McMillen (2010) found different trajectories in a sample of older adolescents in out-of-home care. In a sample of 404 17-year-olds in out-of-home care from the United States child welfare system, they found that the class of youth who displayed decreasing depression trajectories was predominantly female (74%), while male adolescents were more likely to be in the increasing depression trajectory class (80% male). Guibord et al. (2011) found that adolescent females were almost six times more likely to report depression than males, in a sample of 122 younger adolescents 12 to 15 years old in out-of-home care in Ontario. Tonmyr et al. (2011) also found females displayed greater internalizing problems than males in a sample of 4,381 children whose families had been investigated by child welfare in Canada. Valdez et al. (2014) found that females had a higher depression intercept and greater decrease in depression across the first year of their two-year study of adolescents in foster care in the United States. However, these differences disappeared after the addition of other study covariates (i.e. PTSD and emotion dysregulation). Other studies

reviewed above did not observe gender differences in internalizing trajectories/outcomes for children in at-risk and out of home samples (Kennedy et al., 2009; Legault et al., 2006; McWey, Cui, et al., 2010; Rayburn et al., 2016), particularly when anxiety was the outcome of interest (Kennedy et al., 2009; Legault et al., 2006).

In general, females in out-of-home care appear to be at greater risk of internalizing problems. However, findings from growth curve analyses are less clear regarding gender differences in the course of internalizing problems over time. In particular, it appears studies examining depression more often observe gender differences than studies examining anxiety. In either case, gender differences should be taken into account when examining the internalizing outcomes of children in out-of-home care.

Race/ethnicity. Racial differences have been reported in the depression and anxiety outcomes of children and adolescents in contact with the child welfare system. Several studies reviewed above observed racial and ethnic differences. Heneghan et al. (2013) investigated mental health problems in a sample of 815 adolescents (12 to 17) whose families were investigated for maltreatment by the United States child welfare system. These children were not necessarily in out-of-home care placements and those in residential/group care were excluded from analyses due to small sample size. In this sample, researchers found African-American teens were significantly less likely to report anxiety symptoms compared to Caucasian, Hispanic, and “other” ethnicities. Similar findings were seen in Tonmyr et al. (2011) where being Caucasian was associated with greater anxiety and/or depression compared to all other ethnicities in a sample of 4,381 children whose families had been investigated by the child welfare system. However, similar to Heneghan et al. (2013) these children were not necessarily in out-of home care.

Racial differences have also been found in the growth trajectories of depression symptoms over time for children in out-of-home care. Orton (2008) found racial differences in the growth trajectories of children's self-reported depression symptom scores among 2,302 children 7 to 14 years old, whose families had been investigated by the United States child welfare system for maltreatment. Although they did not find any overall differences in the racial distributions across class membership, they did find race by gender interactions. African American and Asian girls displayed significantly decreasing depression scores in both the physical and sexual abuse classes. In boys, decreasing depression scores were seen in the physical abuse class for Caucasian boys, in all maltreatment classes for African American boys, and in the sexual abuse, physical abuse, and neglect/other classes for Asian boys. Results from this study suggest racial differences in the internalizing outcomes of children in contact with the child welfare system. While the results regarding racial differences vary slightly from study to study it is important to consider race/ethnicity when examining the internalizing problems of children in out-of-home care in order to control for possible differences.

Age. There is some evidence that age may serve as a protective factor against mental health problems for children in out-of-home care. Several studies reviewed above also found effects for age. Tonmyr et al. (2011) found that increased age was associated with increased depression and /or anxiety in a cross-sectional sample of 4,381 children whose families had been investigated by child welfare. Similarly, Bell et al. found increased age was related to greater emotional problems in a sample of 531 children (5 to 9 years old) in out-of-home care in Canada. However, they did not observe an effect for age at first placement on emotional problems. Orton (2008), discussed above, found gender

differences only after age 8, where females began to have increased depression compared to males. Other studies show a protective effect for age. Stoner et al. (2015) found children's age at first assessment was related to later decreases in depression. Similarly, McWey et al. (2010) found increased age predicted lower internalizing scores for a sample of 106 adolescents across three years in foster care in the United States.

Age as it relates to removal from the home and time in care also appears to be related to internalizing symptoms for these children. In a sample of 193 children 7 to 15 years old, Rees (2013) found that children who met criteria for positive exception (performing at or above expected levels) tended to be older (91 months vs. 84 months) and their time in out-of-home care was shorter (40 vs 43 months). Although these differences were not statistically significant they suggest that youth who enter out-of-home care later in life and have shorter stays in care display improved overall functioning. Other research suggests adolescents remaining in care display more resilient outcomes. In a sample of 264 17-year-olds in out-of-home care in the United States, Shpiegel (2012) found that youth who left foster care prior to age 19 were less resilient to mental health problems (including anxiety and depression). These results indicate that adolescents who remain in care voluntarily after the age of 18 show more resilient mental health functioning. From these findings it appears that youth who enter out-of-home care later in life and choose to remain in care may exhibit improved outcomes in internalizing problems. Similar findings might be expected when examining anxiety and depression outcomes individually in children in out-of-home care.

Methods

The current study used archival data collected across several years from the Maryland Department of Human Services.

Measures

Child and Adolescent Needs and Strengths (CANS; Lyons, 2009a). The CANS was created as a tool for use within the conceptual framework of Transformational Collaborative Outcomes Management (Lyons & Weiner, 2009; Praed Foundation, 2016). This management approach to human services is intended to involve all the members of a behavioural health care system in order to facilitate communication between these individuals and to better serve clients' needs (Lyons, 2009b). The goal is to keep health care resources focused on a shared vision: the needs of the client and their family. The CANS is designed to inform on the needs and strengths of children and adolescents in contact with child welfare and other human services (Lyons, 2009a).

The version of the CANS used by the Maryland Department of Human Services is comprised of 94 items to assess children on several domains: trauma experiences, trauma stress, functioning, strengths, acculturation, behavioural/emotional needs, risk behaviours, and caregiver needs and strengths. There are also six modules to complete contingent on CANS substance abuse, sexual aggression, runaway, fire setting, contact with the juvenile justice system, and medical/physical needs. These modules were not used in the current study. A copy of the full Maryland CANS can be found in Appendix A. Items are scored on a four-point scale which are meant to inform clients' care using "actionable" levels as follows:

- 0 No evidence, no need for action
- 1 Watching/waiting/prevention

- 2 Action is needed
- 3 Immediate or intensive action needed

A unique feature of the CANS is that it also collects information on a child's strengths (e.g. interests/talents, interpersonal, optimism, spirituality). The concept of strengths is to identify, develop, and use a child's assets in care planning in order to assist them through difficult periods in their life (Lyons, 2009a). Strength items are rated on a similar scale as needs items as follows:

- 0 Centerpiece strength
- 1 Useful strength
- 2 Identified strength
- 3 No strengths identified

Reliability/validity. The CANS requires formal certification to become a rater, leading to notable inter-rater reliability. The CANS has shown inter-rater reliability rates through case-reviews around 0.85 and prospective inter-rater reliability around 0.90 (Lyons, 2004). Individual CANS items have shown reliabilities between .55 and .98. Specific to our study, a mental health version of the CANS with a combined depression/anxiety item showed that the intraclass correlation ranged from .65 to .75, indicating moderate to good inter-rater reliability for this combined item (R. L. Anderson, Lyons, Giles, Price, & Estle, 2003).

The CANS construct validity is shown through correlation with other well-known measures of functioning (i.e. the Child and Adolescent Functional Assessment Survey [CAFAS]; $r = .63, p < .001$). Further, CANS domains have shown correlations between .54 and .73 with their corresponding CAFAS subscales (Lyons, Weiner, & Buddin Lyons, 2004).

To date, no peer-reviewed studies examine the construct validity of individual CANS items. While research is lacking on the construct validity of individual items, face validity can be assumed from its widespread use and acceptance in diverse child serving systems, such as child welfare, mental health services, and juvenile justice systems (Lyons, 2009a). The CANS has also shown effectiveness as a decision support tool. Chor, McClelland, Weiner, Jordan, and Lyons (2012) found that an eligibility algorithm developed using the CANS was concordant with a multidisciplinary team in children's placement in residential treatment 83% of the time. Further, children in the concordant group showed significantly greater improvement on the CANS during treatment compared to the children placed in residential treatment with discordant placements based on the CANS algorithm and team decision. This included greater improvement in the behavioural/emotional needs domain (which includes depression and anxiety ratings) over the discordant group. This study also provides evidence that the CANS shows sensitivity to change over time, as changes in CANS ratings were observed during their time in residential treatment (Chor et al., 2012). Similarly, Stoner et al. (2015) used the depression item on the CANS to model factors associated with decreases in depression over time for 228 children in foster care. This study had a comparatively smaller sample than the current study (N = 1,765); therefore, we should expect to be able to detect changes in CANS depression and anxiety ratings over time in our sample as well. Studies in other areas have successfully used single items from the CANS as both predictor (Cordell, Snowden, & Hosier, 2016; Dunleavy & Leon, 2011; Epstein, Bobo, Cull, & Gatlin, 2011) and outcome variables (Dunleavy & Leon, 2011).

Scoring. Information from the CANS can be used at the single item level, as mentioned above, single item reliabilities range from moderate to excellent. Alternatively,

items can be averaged and multiplied by 10 to create dimensions with a 30 point scale where 0 represents a child with 0 ratings on all dimension items and 30 reflects a child with all 3's on those items (Lyons, 2009a). This method is useful for dimension level analyses. Dimension level reliabilities range from .68 to .85 (R. L. Anderson et al., 2003), and because the CANS can be used at a single item level, new dimensions can also be created using the same calculation method as for the standard dimensions, with a similar dimension structure (Lyons, 2009a). This allows researchers to examine the CANS in multiple ways based on their research needs. This method was used in the current study in order to operationalize the environmental and internal factors outlined in our model. However, composite scores were not multiplied by ten as outlined above. Since we used single items as predictors and outcomes along side composite scores, taking the average of composite items without multiplying by 10 would keep them on the same 0 to 3 scale as other predictors and the outcome variables. Cronbach's alphas were calculated for composite scores to evaluate the internal consistency of each factor because certain items were combined in ways that have not been used in previous studies. In addition, the standardization of composite scores was investigated to ensure proper scaling of all measures. However, because CANS items are all on the same 4-point scale, standardized and unstandardized composites were perfectly correlated, therefore the unstandardized composites were used.

While CANS domains are treated as a continuous outcome in research, when using a single item it should be dichotomized or treated as ordinal. While CANS items are often dichotomized (Lyons, 2009a), which can improve reliability of individual items, Agresti (2007) does not recommend reducing ordinal data into binary as it can cause a loss of

efficiency by creating larger standard errors. This is particularly true when observations are not evenly spread between categories. This is the case for both the anxiety and depression ratings in our sample. Therefore, we treat anxiety and depression as ordinal data in this study using a cumulative logit model.

Although other measures of depression and anxiety, such as the CDI, SDQ, CBCL, and YSR, have been widely used in similar longitudinal studies, these measures contain a greater number of items that put an increased burden of time on caseworkers, children, and/or families to complete. The CANS child emotional and behavioural needs items are designed to distinguish between clinically relevant change (Lyons et al., 2004) and have shown clinical relevancy as a decision support tool for children in out-of-home care (Chor et al., 2012). CANS data is also more readily available than the above-mentioned measures, providing a rich source of longitudinal data from all children in out-of-home care across many states within the United States of America. Rather than relying on self-report data from measures like the CDI and SDQ, the CANS ratings are completed using multiple sources of available information (i.e. children, families, clinicians, teachers, child welfare workers, etc.). Although the CBCL, YSR, and teacher report form are often used together in a single study in order to incorporate multiple sources of information, the CANS incorporates this multiple informant method into each individual item without the burden of each informant completing a questionnaire, as it is a consensus based measurement tool (Obeid & Lyons, 2011). The CANS was selected for the current study in order to examine changes in anxiety and depression over time in a large representative sample of children in out-of-home care in the United States. The benefits listed above outweigh the limitations of using single items as outcome.

The CANS items that were used in the current study as indicators of the environmental and internal resilience factors outlined in our model (see Figure 1) are as follows:

Family functioning. Family functioning was operationalized using two items from the CANS. The item “family” from the child strengths domain refers to the quality of the relationship the child has with members of the family (i.e. strong, loving, supportive relationship with at least one family member). Here, family is defined by the child and can include any relatives and significant others with whom the child is still in contact. The second item is “family” from the life functioning domain. Again, the structure of family is defined by the child but should be focused on biological or adoptive parents and their significant others; foster parents are only considered if they have made a significant commitment to the child. This item refers to how well the child gets along with family. These two items were averaged for a family functioning composite score with a range from 0 to 3. The Cronbach’s alpha for this composite is only .553, which may indicate poor relatedness between items. However, because this composite is constructed of only two items, the low Cronbach’s alpha may also be a reflection of the small number of items included (Tavakol & Dennick, 2011).

Trauma/maltreatment. Trauma and maltreatment experiences were measured using the items from the trauma experiences domain from the CANS. This domain includes 12 items reflecting potentially traumatic experiences children may have experienced as follows: physical abuse, sexual abuse, emotional abuse, neglect, medical trauma, family violence, community violence, school violence, natural disaster, war affected, terrorism affected, and witness to crime. Although trauma/maltreatment ratings are available for all

assessment points in our data, and children may experience continued maltreatment after removal from their homes (Benedict, Zuravin, Brandt, & Abbey, 1994), we treat trauma/maltreatment as a time-stable variable in our models for several reasons. First, we are interested in trauma and maltreatment as it relates to family, rather than foster families and other placements. Also, we can presume children are typically removed from the environments in which they are experiencing trauma and maltreatment, and while ratings may improve on these items over time, the history of trauma/maltreatment remains. By selecting the first rating on each trauma/maltreatment item, we capture the history and severity of trauma experienced in the home. In addition, we included traumatic stress as a time-varying predictor as these symptoms are likely to fluctuate throughout care to a greater degree than maltreatment experiences themselves. Further, any continued trauma/maltreatment may be partially accounted for in the time-varying traumatic stress predictor. Finally, the models presented above are complex and including numerous time-varying predictors reduces power. By including maltreatment at level-2 (time-stable) and traumatic stress at level-1 (time-varying) we will retain greater power while still accounting for changes over time. For further model parsimony, several trauma/maltreatment items were not included as individual predictors. Community violence, natural disaster, war affected, terrorism affected, and witness to crime all displayed rather small mean (0.29, 0.03, 0.01, 0.01, and 0.26 respectively). In addition, these items relate more to experiences outside of the home, where the focus of maltreatment/trauma in this study is primarily in relation to family. The removed items were still accounted for in the cumulative total trauma/maltreatment score. Physical abuse, sexual abuse, emotional abuse, neglect, medical trauma, family violence, and school

violence were included as single items. In addition, we include a cumulative score reflecting total trauma/maltreatment from all items, which can range from 0 to 36 (maximum rating of 3 on all 12 items).

Acculturation. The environmental risk/protective factor of acculturation consists of the items from the CANS acculturation domain. This domain includes five items: language, identity, ritual, cultural stress, and gender/sexual identity. The “language” item evaluates how well the child and family members are able to communicate in English, or whether translation is required in order to communicate with the family and child. The “identity” item refers to how connected the child is to his or her own culture and others who share this culture. The “ritual” item describes the child’s/family’s ability to practice their own cultural rituals, such as holidays, prayer, diet, etc. “Cultural stress” refers to the level of comfort or discomfort a child experiences as a result of perceived friction between their own cultural identity and the predominant culture in which they reside (i.e. experiences with racism). Finally, “gender/sexual identity” refers to the child’s sense of support and connectedness surrounding their sexual/gender identity (e.g. transgender, gay/lesbian, heterosexual, bisexual). These items are averaged for a composite score to reflect overall acculturation, with a range of 0 to 3. However, the gender/sexual identity item is not included in our measure of acculturation since it relates to a slightly different definition of acculturation from that described in our introduction. In addition, excluding this item slightly improved the Cronbach’s alpha from .668 to .674.

Community. The concept of community involvement is defined using a single item, “community life” from the CANS child strengths domain. This item refers to the degree to

which the child is involved in the community in which they live (e.g. member of a community group like the Scouts, knows neighbours well).

Placement. Placement characteristics consist predominantly of the demographic variables listed below. In addition, the CANS item “living situation” in the life functioning domain is included. This item is a subjective measure of how well children are functioning in their current placement and how well caregivers feel they are able to deal with day-to-day challenges that arise.

School functioning. The school functioning factor consists of one CANS item from the child strengths domain, “educational setting”, and three CANS items from the life functioning domain: school behaviour, school achievement, and school attendance. The CANS item “educational setting” reflects the strength of the school/preschool system in terms of meeting the needs of the individual child (e.g. child has an individual education plan as required, school communicates well with caretakers). “School behaviour” describes any behaviour problems in school or school-like settings (e.g. disruptive behaviour in class). The “school achievement” item describes the child’s academic achievement/functioning (i.e. child performing at or above expected levels or below expected levels). Finally, “school attendance” refers to any truancy, history of school absences, or if the child is not enrolled in school. These four items are averaged for a composite score that ranges from 0 to 3. The Cronbach’s alpha for this factor is .761, which meets the minimum standard generally accepted for internal consistency.

Social functioning. The social functioning factor is composed of six CANS items: four items from the child strengths domain (interpersonal skills – peer, interpersonal skills – adult, relationship permanence, and natural supports) and two items from the life

functioning domain (social functioning - peer and social functioning – adult). The “social functioning” items describe how the child interacts with others, both same age peers and adults, and how well they are able to form and maintain relationships. The “interpersonal skills” strength items refer to the child’s interpersonal skills, with both same age peers and non-caregiver adults (e.g. they have close friends and healthy relationships, they are friendly). The “relationship permanence” strength refers to the stability of relationships in the child’s life. These relationships would likely include family members but can also include others (e.g. friends and community members). Finally, the “natural supports” strength item refers to unpaid helpers in the child’s environment; people who provide social support to children and their family. These items are averaged for a social functioning composite score that ranges from 0 to 3. The Cronbach’s alpha for this factor is .838, indicating acceptable internal consistency.

Talents/interests. The talents/interests factor consists of one CANS item from the child strengths domain, “talents/interests.” This item captures any talent, creative/artistic skill, or hobby a child has and the degree they benefit from this (includes art, theater, music, athletics etc.).

Traumatic stress. The emotional factor traumatic stress is comprised of 7 CANS items which make up the CANS domain “symptoms resulting from exposure to trauma” and include: adjustment to trauma, traumatic grief/separation, re-experiencing, avoidance, numbing, dissociation, and affective and/or physiological dysregulation. The majority of these items are analogous with DSM-IV symptoms of PTSD. The “adjustment to trauma” item captures PTSD and other DSM-IV diagnoses resulting from trauma. The “traumatic grief/separation” item measures the level of grief the child is experiencing as the result of

loss or separation from significant caregiver(s), siblings, or others. “Re-experiencing” captures intrusive memories/reminders of traumatic event, nightmares, flashbacks, and reliving the event(s). The “avoidance” item refers to the child avoiding stimuli associated with the traumatic event (i.e. people, places or events) and the severity of the avoidance. The “numbing” item refers to numbing that was not present before the trauma, such as restricted range of affect, inability to experience intense emotions, disinterest in activities, or feeling detached from others. “Dissociation” captures the child’s dissociative symptoms such as daydreaming, spacing or blacking out, forgetfulness, or changes in personality associated with the traumatic experience(s). Finally, “affective and/or physiological dysregulation” refers to difficulty modulating or expressing emotions and energy states, such as outbursts, and can include difficulty regulating body functions such as sleeping, eating, and elimination. It can also include over-reactivity or under-reactivity to touch and sound or physical/somatic complaints. Items are averaged into a composite score, which ranges from 0 to 3. The Cronbach’s alpha for this factor is .885, indicating acceptable internal consistency.

Optimism. The CANS child strength item “optimism” reflects the child’s sense of him/her self in the future and positive future orientation (e.g. having an optimistic outlook, positive about future, or difficulty seeing anything positive in ones life or about ones self; pessimistic).

Spiritual. The “spiritual/religious” item from the CANS child strengths domain captures the child and family’s involvement in spiritual or religious beliefs and activities (e.g. strong moral and spiritual strengths, finds comfort in religious beliefs during difficult times).

Recreation. The CANS “recreational” item from the life functioning domain refers to the child’s access to, interest in, and use of leisure activities that support healthy development and enjoyment.

Health. The concept of health is represented by the CANS life functioning item “medical/physical.” This item assesses the child’s health regarding medical and physical problems, acute and chronic illnesses, life threatening illnesses, and the degree of medical intervention/treatment required. This item includes problems such as hearing or visual impairments, weight, asthma, etc. Mental health problems are not included here.

Externalizing. The externalizing factor is composed of three CANS items from the child behavioural/emotional needs domain: attention deficit/impulse control, oppositional behaviour, and conduct/antisocial behaviour. The “attention deficit/impulse control” item reflects problems with attention, concentration, and task completion, loss of control, impulsive behaviour, and may include symptoms of ADHD and impulse control disorder from the DSM-IV. The “oppositional behaviour” item measures how the child relates to authority. This is different from the conduct item; the emphasis is on non-compliance not inflicting damage. This item relates to the DSM-IV symptoms of oppositional defiant disorder. The “conduct/antisocial behaviour” item characterizes antisocial behaviour like shoplifting, lying, aggression etc. This item includes symptoms of the DSM-IV diagnosis of conduct disorder. These three items are averaged for a composite score, with a range of 0 to 3. The Cronbach’s alpha for this factor is .801, indicating acceptable internal consistency.

Substance use. The item “substance abuse” from the CANS child behavioural/emotional needs domain captures information on use of alcohol, illegal drugs, misuse of prescription drugs, and inhalants and how they might affect other areas of

functioning (e.g. intoxication, school performance, dependence/addiction). This item is consistent with DSM-IV symptoms of substance abuse disorders.

Depression. Depression symptoms are reflected by the CANS child behavioural/emotional needs domain item “depression/mood disorder.” This item refers to symptoms of DSM-IV depressive disorders such as major depression, dysthymia, bipolar disorder, and mood disorder not otherwise specified. Symptoms may include irritable or depressed mood, social withdrawal, sleep disturbance, loss or increase in appetite, and loss of motivation. This item is used as the outcome of interest in the depression model and as a predictor variable in the anxiety model.

Anxiety. Anxiety symptoms are characterized by the CANS child behavioural/emotional needs domain item “anxiety.” This item captures the child’s level of fearfulness, worrying, and other characteristics of anxiety. This includes symptoms of phobia and other DSM-IV anxiety disorders and the amount of interference this causes in daily functioning. This item is used as the outcome of interest in the anxiety model and as a predictor variable in the depression model.

CANS initial assessments are completed within 60 days for all children 5 years and older entering out-of-home placements with the Maryland Department of Human Services. Assessments are also completed whenever children are assessed for a higher level of care (e.g. going from regular foster care to intermediate care, treatment foster care, group care, or residential treatment), assessed for a step down in care, have a change in permanency plan, prior to signing adoption or guardianship agreements, and every 180 days as part of the case reconsideration process (regardless of placement, in order to inform case planning and service delivery).

Demographic information. Demographic information and information on child placements was also obtained from the Maryland Department of Human Services.

The demographic information used in the current study includes: placement type, gender, age, and race/ethnicity, and time in out-of-home care.

Placement type. Placement type categories used by the Maryland Department of Human Services include 33 different categories. Since many placement types had low frequencies, and placement type must be dummy coded for analyses (requiring many variables, which would reduce degrees of freedom), these categories were collapsed into 7 main placement types: kinship care (including trial visits home), foster care (including restricted), treatment foster care, group home/residential (henceforth referred to as residential), residential treatment, institution, and other (including independent living, emergency group/foster care, unknown whereabouts, etc.). Placement type categories were dummy coded into six variables with foster care as the reference category for analysis.

Gender. The Maryland Department of Human Services records gender as either “male or female.” Gender was coded as 0 = female and 1 = male for analysis.

Age. Date of birth, age at entry into out-of-home care, and date at the time of each CANS assessment was provided by the Maryland Department of Human Services. Exact age at the time of each assessment is calculated from the difference between each child’s birth date and date of each assessment. Age at entry into care is included in analyses as well as children’s ages at the time of each CANS assessment. Age and age at entry to care are measured in years.

Race. Information on a child’s primary race is recorded by the Maryland Department of Human Services using the following categories: African American, Caucasian,

American Indian, Asian, Native Hawaiian/Pacific Islander, or unable to determine. The latter four categories displayed low frequencies compared to the first two; therefore they were combined into a single category “other/unknown.” The ethnicity classification of Hispanic origin is recorded in a separate variable by the Maryland Department of Human Services. The classification described above regarding race and ethnic origin follows the United States Census Bureau’s structure (United States Census Bureau, 2017). Race was dummy coded into two variables (Caucasian and other/unknown), with African American as the reference category. Hispanic origin was dummy coded into two variables (Hispanic and Unknown), with non-Hispanic origin as the reference category for analysis.

Time in out-of-home care. Time in care at the time of each assessment was calculated as the difference between exact age at each assessment (calculation described above) and age at entry to care (provided by Maryland Department of Human Services). Time in out-of-home care is represented in months.

Participants

The data for this study was collected from children and adolescents who entered out-of-home care in the state of Maryland, U.S.A. between May 2010 and April 2017. The full dataset includes information on 1,765 children and adolescents who entered out-of-home care between the ages of 5 and 14 years old.

In the general population, the age of onset for anxiety disorders is typically in early childhood, at approximately age 6, and mood disorders typically present in early adolescence, at approximately age 13 (Merikangas et al., 2010). As such, the current study includes only children who entered out-of-home care between the ages of 5 and 14 years in order to best capture the emergence of internalizing problems at this critical stage.

The number of CANS assessments for each child ranged from 3 to 18, with a mean of 4.5 assessments (SD = 1.8). The analyses proposed below allow for uneven assessment time points and number of assessments. However, data from children with only 1 or 2 assessment points were not requested from Maryland Department of Human Services as hierarchical modeling techniques work best with 3 or more time points. While hierarchical linear modeling allows for as few as 1 observation for some participants/groups, a minimum of 3 observations is required to detect non-linear growth.

Including a large range of ages and following them across several years can be problematic in that many developmental changes occur during this time, creating a large amount of variance/error. However, many studies examining children and adolescents in out-of-home care successfully include a wide range of ages in large sample studies, sometimes from infancy to age 19 when children exit the care of the child welfare system (Fawley-King & Snowden, 2012; Koh et al., 2014; Lyons et al., 2000; McWey, Cui, et al., 2010; Stoner et al., 2015). In addition, including age in all analyses will control for the effects of age/development in our models.

Analysis of Data

Study 1 focuses on the growth trajectories of children's anxiety and depression levels and factors that influence these outcomes in order to describe the growth trajectories of these symptoms in children across time in out-of-home care and identify factors that foster resilience towards internalizing problems throughout care.

While there are many definitions for resilience in the research, two common components are that the individual must be doing okay, and that there was significant adversity to overcome (Masten & Powell, 2003). In longitudinal data, resilience can be

defined as a positive ending in a distribution of outcomes in samples of high-risk children (Egeland, Carlson, & Sroufe, 1993). Some research on resilience focuses on how children remain resilient, and define resilient children as those without symptoms. However, because children in out-of-home care are at greater risk of internalizing problems, we focus on resilience as a reduction in or maintenance of lower internalizing symptoms over time. While risk and protective factors are typically discussed in terms of contributing to decreased or increased symptoms, the scoring scheme of the CANS puts all factors in terms of higher ratings indicating greater dysfunction. As such, risk and protective factors are treated similarly in our analyses and we will examine these factors in terms of their relationship to anxiety and depression rating in general. This will allow us to evaluate the process of building resilience or increased maladaptation, rather than simply identifying a subsample of children who remain resilient over time and the environmental and internal factors associated with this subsample. Within the context of the “actionable” CANS rating described above, clinically significant/serious anxiety and depression were defined as a 2 or 3 CANS rating.

Research question. What is the course of internalizing problems for children and adolescents in out-of-home care?

Hypothesis 1. Anxiety and depression symptoms will display decreasing growth trajectories across time for children in out-of-home care.

Hypothesis 2. The odds of having a serious depression or anxiety rating will change based on selected environmental and internal factors.

Analysis. In order to evaluate the first hypothesis, the growth trajectories of anxiety and depression items from the CANS were modeled individually using hierarchical linear

models (HLM; Raudenbush & Bryk, 2002). By using HLM to model growth trajectories, multiple observations (i.e. repeated-measures) are treated as nested within each individual (p. 161). This allows for the number and timing of assessment time points to vary across individuals. This type of analysis is ideal for the current data as children receive CANS evaluations upon entry and exit from out-of-home care and as needed while they are in care, resulting in children receiving CANS assessments at varying time points; and children who are in care for shorter periods have fewer assessments. Separate analyses will be run for the growth models of anxiety and depression.

In HLM it is important to properly assess the shape of the growth trajectory in order for the HLM software to accurately estimate model parameters. As a preliminary step, mean depression and anxiety scores were plotted across age and time-in-care in order to assess the overall shape of the trajectories. In Figure 2 (a) and (b) there appears to be a slight quadratic trend in depression and anxiety ratings across age. Figure 3 (a) and (b) also shows a possible quadratic trend in outcomes across time in care. While there appears to be a large amount of variability in scores beyond approximately 115 months in care, this is likely due to the frequency of children in care dropping from around 100 in any given age category HLM to around 15. At approximately 160 months in care this frequency drops to around 1 to 5 children in any category, creating the appearance of greater variance in scores. The possible quadratic trends across age and time in care were modeled following the procedure outlined by Raudenbush and Bryk (2002), described below.

HLM can accommodate ordinal outcomes using a cumulative probability model. In our study, each outcome has four rating options. For $M = 4$, the cumulative probability equations are:

$$P[R_{ti} \leq 0 | \pi_i] = \varphi^*_{0ti} = \varphi_{0ti}$$

$$P[R_{ti} \leq 1 | \pi_i] = \varphi^*_{1ti} = \varphi_{0ti} + \varphi_{1ti}$$

$$P[R_{ti} \leq 2 | \pi_i] = \varphi^*_{2ti} = \varphi_{0ti} + \varphi_{1ti} + \varphi_{2ti}$$

$$P[R_{ti} \leq 3 | \pi_i] = \varphi^*_{3ti} = \varphi_{0ti} + \varphi_{1ti} + \varphi_{2ti} + \varphi_{3ti} = 1$$

where R_{ti} is the rating at each time (t) for each child (i). Note that $P[R_{ti} \leq 3 | \pi_i]$ is redundant since cumulative probabilities will always sum to one. Therefore, only $M - 1$ cumulative probabilities are needed.

In a two level HLM analysis, level-1 contains the variation within individual trajectories (Raudenbush & Bryk, 2002, p. 162). It consists of the dependent variable(s) (DV) and time-varying independent variables (IVs). Level-2 accounts for variation between individuals, containing time-stable factors. Typically in HLM model building, an unconditional model is first run with no predictors/IVs at level-1 or level-2. The level-1 unconditional model with logit link can be represented with the formula:

$$\eta_{mti} = \log(P(R_{ti} \leq m) / P(R_{ti} > m)) = \pi_{0i} + D_{mti} \delta_{mi}$$

and the level-2 formulas are:

$$\pi_{0i} = \beta_{00} + r_{0i}$$

$$\delta_{mi} = \delta_m$$

In this model the intercept (π_{0i}) is the mean anxiety or depression score. D_{mti} represents dummy variables indicating whether $m = 2$ or 3 (recall only $M - 1$ rating options are required) and δ_{mi} is the rating threshold. In an unconditional model with no level-2 predictors, the formulas for level-2 intercept (π_{0i}) simply consist of the sample's mean intercept (β_{00}) and random effect (r_{0i}), which can be left for estimation or constrained to zero.

In the unconditional ordinal model, the level-1 residuals are assumed to follow the standard logistic distribution with a mean of 0 and variance $\pi^2/3 = 3.29$. The intraclass correlation coefficient (ICC) can therefore be calculated using the formula:

$$ICC = \beta_{00}/(\beta_{00} + 3.29)$$

In order to test hypothesis 1, that anxiety and depression decrease across time in care, time in care and age were added as predictors at level-1. These variables were grand mean centered, and then squared before entering them into each model. The corresponding level-1 formula was:

$$\eta_{mti} = \pi_{0i} + \pi_{1i}*(TIME)_{ti} + \pi_{2i}*(TIME^2)_{ti} + \pi_{3i}*(AGE)_{ti} + \pi_{4i}*(AGE^2)_{ti} + D_{mti}\delta_{mi}$$

and the level-2 formulas were:

$$\pi_{0i} = \beta_{00} + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + r_{2i}$$

$$\pi_{3i} = \beta_{30} + r_{3i}$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

$$\delta_{mi} = \delta_m$$

where $i = 1, \dots, n$ subjects, $(TIME)_{ti}$ is the amount of time in care at assessment date (t) for child (i), $(AGE)_{ti}$ is the age of child (i) at assessment date (t), slope (π_{1i}) represents the average increase/decrease in probability for each child across time in care, and slope (π_{2i}) represents the average increase/decrease in probability for each child across age. Similarly, $(TIME^2)_{ti}$ and $(AGE^2)_{ti}$ represent the squared time in care and age variables that represent the quadratic trend in the data. At level-2, β_{10} represents the average linear slope between people across time in care. Similarly, β_{30} represents the average linear slope

between people across age, β_{20} and β_{30} represent the average quadratic slopes for time in care and age respectively. Finally, r_{0i} through r_{4i} represent the associated variances between children for the intercept, time in care, age, and quadratic trends. The quadratic component for time in care was not significant in either the depression or anxiety model, and was therefore dropped from subsequent models.

In order to test the second hypothesis, time-varying level-1 predictors were added, followed by time-stable level-2 variables. Due to the size of each model, predictors were added incrementally. Initially, all variables were added with variances unfixed, centered around the group mean (i.e. the mean for each child). The six placement type dummy variables were added un-centered and unfixed. Variables with tau correlations above .7, reliability estimates below 0.1, or non-significant variance components had their variances fixed in subsequent versions of the model. The level-1 variables included: (1) co-occurring anxiety/depression, (2) family functioning, (3) acculturation, (4) community, (5-10) placement type dummy variables, (11) living situation, (12) school functioning, (13) social functioning, (14) talents/interests, (15) traumatic stress, (16) optimism, (17) spirituality, (18) recreation, (19) health, (20) externalizing problems, and (21) substance use. In both models, the variances for co-occurring anxiety/depression were left to vary, while the rest of the variances (r_{1i} through r_{24i}) for level-1 predictors were fixed.

Next, level-2 predictors were added to the model to explain variance in the intercept. The level-2 variables included: (1) gender, (2-5) race/ethnicity dummy variables, (6-12) trauma/maltreatment items, and (13) total trauma. Trauma items were grand mean centered, while gender and the race dummy coded variables were added un-centered. Level-2 variables were also added to the models as moderators for the varying slopes

between outcomes and co-occurring anxiety/depression (i.e. anxiety predicting depression and vice versa). Since none of the moderators significantly explained any of this variance in either model, the more parsimonious models without moderators were retained. Age at entry could not be added at level-2 in either model due to a near singularity, indicating multicollinearity between predictors. Although age at removal was not highly correlated with either time in care ($r = -.212, p < .001$) or mean age ($r = .60, p < .001$) for each child, age at entry was not included in the final model. Since age and time in care were already found to be significant in hypothesis 1, those variables were retained for the final model.

The formulas for the final models were:

$$\begin{aligned} \eta_{mti} = & \pi_{0i} + \pi_{1i}*(TIME)_{ti} + \pi_{2i}*(AGE)_{ti} + \pi_{3i}*(AGE^2)_{ti} + \pi_{4i}*(anxiety/depression)_{ti} \\ & + \pi_{5i}*(talents)_{ti} + \pi_{6i}*(optimism)_{ti} + \pi_{7i}*(traumatic\ stress)_{ti} + \pi_{8i}*(spiritual)_{ti} \\ & + \pi_{9i}*(recreation)_{ti} + \pi_{10i}*(health)_{ti} + \pi_{11i}*(externalizing)_{ti} + \pi_{12i}*(substance)_{ti} \\ & + \pi_{13i}*(family)_{ti} + \pi_{14i}*(acculturation)_{ti} + \pi_{15i}*(community)_{ti} \\ & + \pi_{16i}*(placement\ adjustment)_{ti} + \pi_{17i}*(school)_{ti} + \pi_{18i}*(social)_{ti} \\ & + \pi_{19i}*(placement\ 1)_{ti} + \pi_{20i}*(placement\ 2)_{ti} + \pi_{21i}*(placement\ 3)_{ti} \\ & + \pi_{22i}*(placement\ 4)_{ti} + \pi_{23i}*(placement\ 5)_{ti} + \pi_{24i}*(placement\ 6)_{ti} + D_{mti}\delta_{mi} \\ \pi_{0i} = & \beta_{00} + \beta_{01}*(gender) + \beta_{02}*(sexual\ abuse) + \beta_{03}*(physical\ abuse) \\ & + \beta_{04}*(emotional\ abuse) + \beta_{05}*(neglect) + \beta_{06}*(medical\ trauma) \\ & + \beta_{07}*(family\ violence) + \beta_{08}*(school\ violence) + \beta_{09}*(total\ trauma) \\ & + \beta_{010}*(race:\ white) + \beta_{011}*(race:\ other) + \beta_{012}*(Hispanic:\ yes) \\ & + \beta_{013}*(Hispanic:\ unknown) + r_{0i} \\ \pi_{1i} = & \beta_{10} + r_{1i} \end{aligned}$$

...

$$\pi_{24i} = \beta_{240} + r_{24i}$$

The log odds coefficients produced in a cumulative probability model can be converted into an odds ratio using the formula $OR = \exp\{\beta_{00} + \delta_1\}$, the intercept (β_{00}) is added to the threshold of interest (in our case, δ_1 which represents the odds of a 1 or less) before raising to the natural base e. Alternatively this can be expressed as a probability using the formula $\varphi = \exp\{\beta_{00} + \delta_1\} / (1 + \exp\{\beta_{00} + \delta_1\})$. Similarly, the odds ratio associated with a particular predictor of interest can be calculated as $OR = \exp\{\beta_{00} + \delta_1 + \beta_x\}$, where β_x is the log odds coefficient for the predictor of interest, or as a probability with the formula $\varphi = \exp\{\beta_{00} + \delta_1 + \beta_x\} / (1 + \exp\{\beta_{00} + \delta_1 + \beta_x\})$.

Missing data. HLM can handle missing data at level-1 but not at level-2. At level-1, missingness ranged from 0.3 to 0.5% for most predictors. Our two outcome variables (depression and anxiety) were both 0.5% missing. Placement type was missing for 10.6% of assessments. A missing value analysis showed that missing values on the placement type dummy variables were not related to either depression or anxiety in our sample. Typically, regression based imputation methods are used to estimate missing values while introducing minimal bias (i.e. multiple imputation, maximum likelihood). However, because placement type is used as an outcome variable in Study 2, regression based imputation is not ideal. Simulation research has shown that rounding imputed values introduces bias (Allison, 2005), and Bernoulli analysis would not be possible with unrounded values. In order for results to be comparable across studies, regression based imputation was not used. While logistic imputation methods have been developed in some software packages, these methods require monotonic missing data (Allison, 2005). This means that missing values are missing for all subsequent time points and non-missing

values are non-missing for all previous time points for each assessment. Since this is not the case for the current data, these methods were not options for this study.

Our level-2 predictors age at entry, gender, and trauma items, including cumulative trauma/maltreatment did not contain missing data. Race and ethnicity contained 1.7% and 0.8% missing data respectively. However, these variables were dummy coded in such a way that missing variables were coded into the “other/unknown” variable for race and “unknown” for ethnicity, in order to retain the full sample.

Software. All data preparation was done using SPSS for Macintosh version 21.0 (IBM Corp, 2012). Data was then imported into HLM 7.01 for the analysis of all hierarchical models discussed above (Raudenbush, Bryk, & Congdon, 2013).

Ethics Approval

The current study was approved by the University of Ottawa Office of Research Ethics and Integrity, file number H08-16-03. Ethics approval was also granted from the Maryland Human Services Agency, Department of Human Services, RRB 2016-0802. See Appendix B for ethics letters of approval.

Results

Sample Characteristics

The final sample included 1,765 children in out-of-home care in Maryland, U.S.A. Descriptive statistics for all level-2 variables are presented in Table 1 and descriptive statistics for all level-1 variables are presented in Table 2. The sample was 51.4% male, and age across all assessments ranged from 5.1 years to 21.1 years with a mean age of 14.4 years ($SD = 3.8$) across all participants. The number of CANS assessments per child ranged from 2 to 18, with a mean of 4.5 ($SD = 1.8$) and 7,979 assessments in total.

The sample was mostly African American (55.9%) followed by Caucasian (39.9%) and a small portion classified as other/unknown (4.2%). The ethnic origin of children was predominantly non-Hispanic (92.0%) with 6.7% of children identified as having Hispanic origin.

As displayed in Table 2, the mean anxiety rating across all children was 0.80 ($SD = 0.73$), indicating no or mild/history of anxiety for most children. Similarly, the grand mean for depression was 0.74 ($SD = 0.70$) indicating no or mild/history of depression for most children. The lifetime prevalence rates for "actionable" anxiety and depression were also calculated by taking the highest CANS ratings for both anxiety and depression at any time point during a child's time in care. Although the grand mean for each outcome appears low, as seen in Table 1, the lifetime prevalence of "actionable" anxiety and depression were 32.7% and 29.6% respectively. Table 3 and Table 4 display the correlations between anxiety and depression ratings and all level-1 and level-2 predictors respectively.

Anxiety

Hypothesis 1. The initial, unconditional, model for anxiety indicated significant variance in anxiety scores between children ($\sigma^2 = 7.697$, $\chi^2(1764) = 12146.823$, $p < .001$). We were therefore justified in adding level-2 predictors to explain this variance. The ICC in the unconditional model was .701, indicating approximately 70.1% of the variance in anxiety scores lies between children rather than within children over time.

An ordinal logistic regression model was used in order to test the first hypothesis that anxiety scores decrease across time in care. First, age and age² were added grand mean centered with variances unfixed. The reliability estimates for age and age² were 0.04 and 0.01 respectively, below the 0.1 cutoff; therefore the variance components for age and age² were fixed to be non-randomly varying. Next, time in care and time in care² were added, grand mean centered with the variance component unfixed. Time in care² displayed low reliability (0.01), was highly correlated to the intercept ($r = -0.97$), and did not significantly predict anxiety odds. It was therefore removed from the model.

Results are displayed in Table 5. Using the formula to convert log odds into odds, the cumulative odds of a child having an anxiety rating of 0 or 1 was $OR = \exp(\beta_{00} + \delta_1) = \exp(-1.07 + 3.68) = \exp(2.61) = 13.60$ times more likely than a 2 or 3 anxiety rating. Therefore, for the anxiety model, the probability of a 0 or 1 anxiety rating was $\varphi_{ti} = \exp(13.60)/(1 + \exp\{13.60\}) = 0.9315$. By extrapolation, the chance of having a 2 or 3 anxiety rating at the mean age of 14.44 ($SD = 3.82$) was $1 - 0.9315 = .0684$, or 6.8%. With age² in the model, age did not significantly predict a linear

change in anxiety ratings. This indicates a fully quadratic change in scores across age. As seen in figure 2(a), the probability of serious anxiety increases slightly, and then decreases slightly across the 5 to 20 year age range in assessments. Time in care did not significantly predict changes in odds of anxiety ratings.

Hypothesis 2. In order to test the second hypothesis, that change in anxiety scores can be explained by internal and environmental factors, a comprehensive model was built using the proposed level-1 and -2 predictors. To begin, internal level-1 predictors were added to the model from hypothesis 1, followed by the external/environmental variables. Initially, all variables were added with variances unfixed, centered around the group mean (i.e. the mean for each child). The six placement type dummy variables were added un-centered and unfixed. Variables with tau correlations above 0.7, reliability estimates below 0.1, or non-significant variance components had their variances fixed in subsequent versions of the model. All level-1 predictors, excluding depression, had their variances fixed in the final model.

Next, level-2 predictors were added to the model to explain variance in the intercept. Trauma items were grand mean centered, while gender and the race dummy coded variables were added un-centered. The level-2 predictors were also added as moderators to explain the variance in depression by anxiety slopes between children. Since none of the moderators significantly explained any of this variance, the more parsimonious model without moderators was retained. Results from the final model are presented in Table 6.

In the final model, the odds ratio of having a 0 or 1 anxiety rating was 48.69, which corresponds to a 2.01% chance of having elevated anxiety (2 or 3 rating) overall (i.e. with all other variables held constant). Of the internal factors, three significantly predicted the slope in anxiety scores: depression, externalizing problems, and traumatic stress. Using the log odds to probability formula presented previously, the probability associated with a 0 or 1 CANS anxiety rating with one unit increase in depression was $\varphi = \exp(-0.54 + 4.43 - 1.72) / (1 + \exp\{-0.54 + 4.43 - 1.72\}) = 0.8967$, or by extrapolation a 10.32% chance of a 2 or 3 with a one point increase in depression. This corresponds to an 8.31% increase in odds of serious anxiety associated with increased depression (by subtracting the intercept probability of 2.01% from 10.32%). Similarly externalizing problems were associated with a 3.93% increase in the chance of having serious anxiety and increased traumatic stress was associated with a 3.22% increase in the chance of having serious anxiety.

Two environmental factors significantly predicted changes in anxiety scores, trauma experiences and placement type. At level-1, five of the six placement variables were associated with a significant increase in actionable anxiety compared to regular foster care; being in treatment foster care increased the chance of serious anxiety by 1.05%, being in residential care increased the chance of serious anxiety by 2.85%, being in residential treatment increased the chance of serious anxiety by 7.14%, being in institutional care increased the chance of serious anxiety by 3.64%, and being in a placement type classified as other or unknown increased the chance

of serious anxiety by 0.88%. The change in odds associated with kinship care was not significantly different from the odds associated with regular foster care.

At level-2 the trauma/maltreatment items that predicted changes in anxiety scores were sexual abuse, emotional abuse, and school violence. Increased sexual abuse was associated with an increased likelihood of having an anxiety rating of 2 or 3 by 1.19%. Similarly, increased emotional abuse was associated with a 1.75% increased chance of an anxiety score of 2 or 3. Finally, exposure to school violence was associated with a 2.27% increased chance of having a 2 or 3 anxiety rating.

Of the demographic variables included in the model, only race was a significant predictor of change in odds of anxiety scores. Caucasian children had a 3.09% increased chance of having serious anxiety compared to African-American children. No other racial/ethnic differences, including Hispanic origin, were observed. No gender differences were observed in the odds of anxiety ratings.

The effects of age and time in care remained non-significant in the final model, while the quadratic trend in age remained significant.

Depression

Hypothesis 1. The initial, unconditional, model for depression scores indicated significant variance in depression scores between children ($\sigma^2 = 7.013$, $\chi^2(1764) = 11405.995$, $p < .001$). We were therefore justified in adding level-2 predictors to explain this variance. The ICC in the unconditional model was .681, indicating approximately 68.1% of the variance in depression scores lies between children.

Again, an ordinal logistic regression model was used in order to test the first hypothesis that depression scores decrease across time in care. First, age and age² were added grand mean centered with variance unfix. The reliability estimates for age and age² were 0.03 and 0.01 respectively, below the 0.1 cut-off, therefore the variance components for age and age² were fixed to be non-randomly varying. Next, time in care and time in care² were added, grand mean centered with variance components unfix. The reliability estimate for time in care² was 0.004, and time in care² was highly correlated with the intercept ($r = -.954$). Therefore, the variance component for time in care² was fixed. After fixing the variance, time in care² did not significantly predict change in depression odds. Therefore it was removed from the model for greater parsimony. Results are displayed in Table 7.

The cumulative odds of having a 0 or 1 CANS depression rating was 20.67 times more likely than a 2 or 3 rating. Converting the odds ratio into a probability, there was a 4.61% chance of a child having a depression rating of 2 or 3 at 58.76 months in care (approximately 5 years) and at the mean age of 14.44 (SD = 3.82). A one-year increase in age was associated with a 1.08% increased chance of depression requiring intervention (2 or 3 rating). The quadratic component for age was also significant, indicating a non-linear component in the rate of change in the probability of depression scores across age. As seen in Figure 2(b), there is an overall increase in odds of serious depression across age with a slight curvilinear component. Conversely, one month of time in care was associated with a 0.07% decrease in depression levels requiring intervention.

Hypothesis 2. In order to test the second hypothesis, that change in depression scores can be explained by internal and environmental factors, a comprehensive model was built using the proposed level-1 and -2 predictors using the same procedure for model building as with the anxiety model. Internal level-1 predictors were added to the model from hypothesis 1, followed by the external/environmental variables. Again, all variables were added with variances unfixed, centered around the group mean (i.e. the mean for each child). The six placement type dummy variables were added un-centered and unfixed. Variables with tau correlations above .7, reliability estimates below 0.1, or non-significant variance components had their variances fixed in subsequent versions of the model. All level-1 predictors, aside from anxiety, had their variances fixed in the final model.

Next, level-2 predictors were added to the model to explain variance in the intercept. Trauma items were grand mean centered, while gender and the race dummy coded variables were added un-centered. The level-2 predictors were also added as moderators in an attempt to explain the variance in depression by anxiety slopes between children. Since none of the moderators significantly explained any of this variance, the more parsimonious model without moderators was retained.

Results from the final model are presented in Table 8.

In the final model for depression, the odds of having a rating of 0 or 1 was 46.71, which corresponds to a 2.10% chance of having depression requiring intervention (score of 2 or 3) overall (i.e. with all other variables held constant). Four internal items significantly predicted depression scores: optimism, anxiety, traumatic stress, and externalizing problems. Decreased optimism was associated

with a 0.58% increase in the chance of having a 2 or 3 depression rating. Increased anxiety was associated with an 8.55% increased chance of having a 2 or 3 depression rating. Externalizing problems were associated with a 2.60% increased chance of having actionable depression, and traumatic stress symptoms were associated with a 3.69% increased chance of having a 2 or 3 depression rating.

Five environmental factors significantly predicted depression scores: family functioning, trauma experiences, community connectedness, placement type, and school functioning. At level-1, increased family dysfunction was associated with a 0.74% increase in actionable depression. Similarly, poorer community connectedness was associated with a 0.43% increase in the chance of actionable depression. Poorer school functioning was also associated with a 0.45% increase in the chance of actionable depression.

Three out of six placement categories were associated with a significant increase in actionable depression. Compared to being in a foster care setting, being placed in a residential placement was associated with a 1.05% increased chance of serious depression. Being in a residential treatment placement was associated with an 8.32% increased chance of serious depression. Finally, being in an institutional placement was associated with a 5.71% chance of serious depression compared to regular foster care. Kinship care, treatment foster care, and placements classified as other/unknown did not have a significant impact on the likelihood of having depression scores odds different from children in regular foster care.

At level-2, several trauma experiences, including total trauma, were associated with a change in odds of a 2 or 3 depression rating. Increased emotional

abuse was associated with a 0.83% increase in the chance of actionable depression, while having experienced medical trauma was associated with a 0.72% decrease in the chance of having actionable depression. Exposure to family violence was also associated with a 0.70% decrease in actionable depression. Despite the effects of medical trauma and family violence, total trauma/maltreatment was associated with a 0.63% increase in actionable depression.

Two of the three demographic variables significantly predicted changes in odds of depression ratings. Being male reduced the chance of having serious depression by 0.86%. Age remained a significant contributor to depression rating odds. In the final model, a one-year increase in age was associated with a 0.62% increase in the chance of a 2 or 3 depression rating. The quadratic component to age remained significant in the final model as well. No racial differences were observed in the depression model, including Hispanic origin.

Finally, time in care also retained its significance in the final model. For every one month in care, there was a 0.03% decrease in the chance of an actionable depression rating.

Discussion

Hypothesis 1: Internalizing Symptoms Across Time in Care

Our first hypothesis was that anxiety and depression symptoms would display decreasing growth trajectories across time for children in out-of-home care. Results from Study 1 partially support this hypothesis. Depression ratings showed a significant decrease in severity with time in out-of-home care, while anxiety ratings did not. These findings are consistent with previous research on depression in children in out-of-home care (Augenbraun, 2004; Lyons et al., 2001; Munson & McMillen, 2010; Orton, 2008).

Munson and McMillen (2010) found low depression scores overall in a sample of 404 older youth (17 year olds) exiting foster care. And depression scores showed a slight decrease across their two-year study. These finding are similar to ours, with a low proportion of children showing serious levels of depression overall and a small decrease in the probability of a 2 or 3 CANS rating with increased time in care. However, although the majority of children (78%) in Munson and McMillen (2010) had low depression over time, they also found 2 other unique trajectories in their sample: low and increasing, or high and decreasing depression scores. Orton (2008) also found that depression scores decreased across three years for 2,302 children 7 to 14 years old, whose families had been investigated for maltreatment. This sample included both children in out-of-home care and children who were not removed from their homes.

There are fewer studies examining anxiety symptoms alone in children in out-of-home care, however, our findings are consistent with McWey et al. (2010) where no significant linear change was found for internalizing problems across 3 years in out-of-home care. This study used the internalizing subscale from the CBCL in a sample of 106

adolescents, aged 13 to 16 in long-term foster care. Our findings are not consistent with other studies in this area (Augenbraun, 2004; Lyons et al., 2001). We found anxiety scores to be relatively stable across time in care. In Augenbraun (2004), both anxiety and depression were found to decrease across time in care. However, they found this pattern only across adolescents' entire time in care. When looking at only the first nine months in care, no changes in internalizing problems were observed. Conversely, Lyons et al. (2001) found a significant increase in anxiety scores across time in care. However, the time range for cases included in this study ranged from nine months to two years. In our study, time in care ranged from 4 to 185 months, with a mean of 58.5 months (4.9 years), significantly longer than the two years examined by Lyons et al. (2001). And the 8 to 46 months ($M=17.5$) examined by Augenbraun (2004). Considering this, it appears that anxiety scores may fluctuate when examining shorter periods of time in care, but when taking into account a longer time frame, anxiety remains fairly stable. Neither Augenbraun (2004) nor Lyons et al. (2001) controlled for age in their studies. The increases and decreases in anxiety observed in those studies may have been confounded by changes across age. Considering we observed a quadratic trend in anxiety across age, where scores increase and then decrease slightly, Augenbraun (2004) and Lyons et al. (2001) may have been observing age related changes rather than changes related to time in care. After we controlled for age related changes, anxiety did not significantly change over time in out-of-home care. Another limitation to the Augenbraun (2004) study was that anxiety and depression were combined with other disorders to form an internalizing score. It is not known whether the reduction in symptoms was actually due to reduced anxiety, depression, or another mental health problem. Our findings suggest that age related changes, and inter-individual

differences are more important considerations regarding anxiety for children in out-of-home care.

In the model for hypothesis 1, depression scores showed an increase in severity with increased age, and both outcomes displayed a small quadratic trend. This is consistent with previous research on developmental changes in depression and anxiety scores in community samples.

Similar to our findings, Fernandez Castelao & Kröner-Herwig (2013) found the majority of children displayed low but increasing depression scores across four years in a community sample of 3,902 German children (aged 9 to 14). However, Orton (2008) found depression scores decreased as age/time increased, in a sample of children involved with the US child welfare system (89% remained in home). Age was the metric for time in this study, as it is often used in developmental research. However, when analyzed cross-sectionally, they found depression increased with increased age at the baseline measurement. The cross-sectional findings are consistent with our sample.

Our findings regarding anxiety are also similar to community samples. Age and time did not significantly predict anxiety scores. However, we did observe a small quadratic trend in anxiety scores, where scores increased slightly and decreased slightly across childhood and adolescence, returning to the low levels initially observed. It is possible the anxiety trajectories of children in out-of-home care are more similar to children in the general population than initially thought. In a community sample of 224 children 4 to 11 years old, Broeren et al. (2013) found the most frequent trajectories for anxiety symptoms were low and stable, or moderate and stable, across two years. Similarly, in a community sample of 290 boys aged 2 to 10, Feng, Shaw, and Silk (2008) found the largest class

(50.8% of boys) maintained low and stable anxiety levels over time. It should be noted that in both of the previously mentioned studies the researchers used age as the metric for time. Although we observed a slight quadratic trend across age, it is possible that anxiety scores over time/age are relatively stable in our sample, with other factors contributing more significantly to changes in anxiety ratings.

It appears that the way in which time is represented in developmental research is important to the results observed, and time should be carefully defined for children in out-of-home care. For example, in a community sample of 100 German children (8 to 13 years old) who witnessed family violence, researchers found anxiety decreased across two years, where time was measured by time elapsed since study initiation (Kennedy et al., 2009). While studies which use age as the time metric have found anxiety scores tend to remain stable across time/age (Broeren et al., 2013; Feng et al., 2008), in our study, time in care and age were included as individual predictors and results show these two variables uniquely contributed to depression estimates. This method supports other research in which age as the measure of time has been shown to produce different results than time measured by time in study (Chalise, Chicken, & McGee, 2016). Chalise et al. (2016) suggest using two or more different measures of time to account for as much of the variance between different metrics as possible. While age is often used as the metric for time in developmental trajectory research, this may not be sufficient when researching trajectories for children in out-of-home care. It is also important to assess non-linear trends over time and age. These children often have traumatic experiences, including removal from the home, which may create additional variation including non-linear change in psychological symptoms, suggested by the significant quadratic trend observed in both depression and

anxiety ratings across age. Metrics other than linear, age related change should be considered when trying to model these psychological symptoms over time.

Overall, anxiety and depression ratings were fairly low across age and time in care. Children in our sample were 13.6 times more likely to have no or mild anxiety (0 or 1 rating) compared to moderate/serious anxiety (2 or 3 rating). Similarly, children were 20.67 times more likely to have no or mild depression compared to moderate/serious depression. However, when examining the lifetime prevalence of “actionable” anxiety and depression in this sample (i.e. a score of 2 or 3), rates were similar to that of other studies examining out-of-home populations. McMillen et al. (2005) found lifetime prevalence rates of major depression to be 27% in a sample of 373 17-year-olds living in out-of-home care in Missouri. This is comparable to the lifetime prevalence rate of depression in our sample (29.6%). Lifetime prevalence estimates for anxiety in out-of-home samples could not be found. However, point estimates suggest anxiety disorder prevalence rates of approximately 13.5% in children in contact with the U.S. child welfare system (Heneghan et al., 2013). The lifetime rate of 32.7% observed in this study was much higher than the point estimates from Heneghan et al. (2013), as would be expected when comparing point estimates to lifetime rates. However, our lifetime rate was also higher than those found by Beesdo et al. (2009) in various adolescent community samples, which were generally 15% to 20%. Therefore, although the means for anxiety and depression in our sample appear low overall, they are comparable to rates in other out-of-home samples and higher than community lifetime rates.

Hypothesis 2: Predictors of Internalizing Resilience

Our second hypothesis was that the odds of having a serious depression or anxiety rating would change based on selected environmental and internal factors. This hypothesis was also partially supported, since many proposed predictors did not contribute significantly in the final models. Figure 4 displays the relevant predictors for both anxiety and depression in a final model diagram.

This study was the first to examine comprehensive models for both anxiety and depression for children in out-of-home care. While previous research has provided evidence for each of the indicators included in our models, including all risk and protective factors in a single exploratory model for each internalizing problem allowed for only the most robust predictors to remain significant in the final models.

Several studies examined multiple risk and protective factors in a larger model, but none as comprehensive as the current models. The study by Stoner et al. (2015) is perhaps the most similar to ours. Using Optimal Data Analysis, an exploratory analysis method, they included all CANS-MH (mental health version of the CANS) items and composite CANS scores in predicting a reduction in depression scores for foster care children (aged 4 to 20). Items and participants were removed in steps from the analysis based on the best predictors of improvement (0 or 1 CANS rating) or no improvement (a 2 or 3 CANS rating) at discharge until no statistical significance was observed. In order of effect strength, the predictors that emerged from their analysis was (1) adjustment to trauma change score (an item included in our traumatic stress composite), (2) change in family functioning, (3) composite strengths or change in sexually abusive behaviour (neither included in our analysis, some strengths included as individual items), and (4) change in school functioning.

Our model for depression also included family functioning, school functioning, and one child strength (optimism) among the significant predictors. However, we also found additional predictors. It is possible that the differing analysis methods produced different predictors in these two models for depression, despite the use of similar measures (CANS) and populations.

It is also possible that some of the risk and protective factors identified in less complex analyses were found significant only in the absence of stronger predictors. For example Munson and McMillen (2010) found substance use highly related to the increasing depression class compared to low and stable or decreasing depression trajectories in a sample of 404 adolescents exiting the child welfare system. While these researchers did include gender, maltreatment, placement type, behaviour problems, and family mental health, they did not account for traumatic stress/PTSD or other co-occurring anxiety. These two latter factors proved to be strong predictors in our study. However, it is also possible that this difference in findings was due to differences in our sample ages, as we will discuss below. Similarly, Kennedy et al. (2009) found witnessing interpersonal/family violence was related to increased anxiety in a sample of 100 children (8 to 13 years old) whose families had experienced interpersonal violence. While these researchers included community and school violence, family social support, and gender in their analysis, they did not include possible maltreatment, co-occurring depression, or behavioural problems. These latter three factors predicted increased odds of serious anxiety in our study. By including predictors from many facets of a child's internal and environmental attributes, we may uncover a more holistic understanding of anxiety and depression in children in out-of-home care.

Several predictors showed overlap in both models. Among the internal resilience items, traumatic stress, co-occurring anxiety/depression, and externalizing problems all predicted changes in odds of anxiety and depression. From the environmental factors, both trauma/maltreatment and placement type were significant in both models, however the significant items within these factors were different in each model. Emotional abuse was significant in both models while sexual abuse and school violence predicted only anxiety and medical trauma, family violence, and total trauma predicted only depression. Residential care, residential treatment, and institutional placements predicted significantly worse anxiety and depression compared to kids in regular foster care. While treatment foster care and the “other/unknown” placement category predicted increased odds of anxiety only. Kinship care did not predict a change in odds compared to regular foster care for either outcome.

The final model for depression included several more significant predictors than the model for anxiety. The internal factor optimism predicted lower odds of serious depression. And the environmental protective factors of family functioning, school functioning, and community involvement also predicted lower odds of serious depression. While fit indices, including explained variance, cannot be computed in ordinal HLM, the proposed model appeared to fit the data well for depression scores across time in care, as many of the proposed predictors significantly predicted changes in odds of depression symptoms.

The final model for anxiety did not include any unique predictors beyond that of the depression model (outside of those trauma/maltreatment and placement type variables already discussed above). Anxiety symptoms have been researched far less than symptoms of depression in out-of-home care populations. Further research is needed in developing a

comprehensive model for anxiety in children in out-of-home care. This is particularly true for predictors of resilience, or decreasing anxiety.

As mentioned above, time in care retained its significance in the final model for depression but was not significant in the model for anxiety. Indicating depression decreases throughout time in care but anxiety appears to remain relatively stable.

The demographic predictors did not show much overlap between the two models, with racial differences in the anxiety model and age and gender effects in the depression model. However, the quadratic component to age remained significant in both models. Implications from each individual predictor are discussed in detail below.

Internal factors. In the final model for both anxiety and depression, two predictors classified as emotional (anxiety/depression and traumatic stress) and one behavioral predictor (externalizing problems) were related to changes in the odds of having non-zero anxiety and depression ratings. In addition one cognitive predictor, optimism, was associated with changes in the odds of depression ratings.

Anxiety/depression. The expected co-occurrence between anxiety and depression was reflected in both models. Since comorbidity between anxiety and depression are common in the general population (Axelson & Birmaher, 2001), and maybe even more frequent in out-of-home samples (Leenarts et al., 2013; Meltzer et al., 2002), it was important to control for the effects of this co-occurrence in each model. In both models, co-occurring depression/anxiety was associated with the largest increase in odds of serious anxiety and depression compared to any other model predictors. In Study 2 we will explore the relationship between anxiety and depression in more detail by exploring possible reciprocal relationships using time-lagged scores.

Traumatic stress. The emotional predictor traumatic stress was associated with increased odds of both more severe anxiety and depression. Our findings are consistent with results from Rayburn et al. (2016), where they found decreases in traumatic stress were associated with decreases in internalizing problems across three years in out-of-home care, in a sample of 155 children 11 to 15 years old. A limitation in the study by Rayburn et al. (2016) was that they did not distinguish between anxiety and depression; their measure of internalizing included the withdrawn, anxious-depressed, and somatic complaints subscales from the Youth Self Report. However, our study supports the findings that traumatic stress predicts changes in both anxiety and depression individually.

We found greater traumatic stress was associated with an increased probability of a 2 or 3 CANS depression rating. Our results are similar to the second piecewise analysis by Valdez et al. (2014) who found that a diagnosis of PTSD at baseline was associated with a greater increase in depression compared to those without a PTSD diagnosis in a sample of older adolescents exiting foster care. Unlike our results, however, they also found that a PTSD diagnosis predicted greater reduction in depression across the first year in the study. The authors suggest this is a phenomenon of youth with PTSD becoming more hopeful towards exit from care initially, but experience a rebound in symptoms with the addition of all that is required for independent living during the second measurement period. Unlike the study by Valdez et al. (2014), we did not perform a piecewise analysis; our analysis used a continuous measure for traumatic stress at each time point to take into account expected fluctuations in stress symptoms at each evaluation. Taking into account current traumatic stress when evaluating depression may provide additional information beyond an initial diagnosis of PTSD. It is possible that many of the youths from Valdez et al. (2014)

no longer met criteria for PTSD at subsequent measurement points (i.e. PTSD symptoms decreased with decreases in depression over the first year), and that our results more accurately reflect the dynamic relationship between depression and traumatic stress.

The relationship between traumatic stress and other anxiety disorders in children in out-of-home care has not been widely studied. Pynoos et al. (1999) propose a model in which PTSD and other anxiety disorders follow a similar mechanism in which onset is preceded by traumatic experiences. These experiences are thought to be part of a developmental trajectory towards maladaptation through a cycle of avoidance, ineffective child-parent interactions and worsening psychopathology. Our results provide some evidence that worsening traumatic stress is linked to more severe anxiety in children in out-of-home care. And since many children in out-of-home care have experienced trauma and/or neglect in addition to removal from the home (which may contribute as an additional traumatic event), the model presented by Pynoos et al. (1999) may provide some context to our results. However, since CANS raters in our study are not clinical psychologists, it is possible that rater bias has contributed to this effect, where raters are not sufficiently trained to distinguish between items on the trauma scale and the anxiety item. Rater bias is discussed further in our general limitations. Despite potential error due to bias, further exploration of the link between trauma, traumatic stress, and other anxiety disorders is warranted.

Externalizing problems. Increases on the externalizing problems composite score were associated with increased odds of a CANS 2 or 3 rating for both anxiety and depression. While Munson and McMillen (2010) found disruptive behaviour disorder associated with both increasing and decreasing depression trajectories for children in

foster care, they only measured initial symptoms of disruptive behaviour disorder. We have behaviour problems scores for each time point in which we have anxiety and depression ratings. Our findings suggest that increased behaviour problems are associated with increased depression and anxiety. The findings from Munson and McMillen (2010) may have been the result of mean depression scores across all time point, rather than related to increasing or decreasing scores since the difference in behavioural problem prevalence was in comparison to the never depressed trajectory, which would have a lower mean across time compared to the other two classes.

While no previous studies examined the relationship between externalizing problems and anxiety alone in out-of-home care child samples, our study supports findings from McWey et al. (2010) where internalizing problems were highly correlated with externalizing problems in a sample of 206 adolescents aged 13 to 16 in foster care in the US. Our anxiety findings are also supported by research in community samples. Roza et al. (2003) found initial externalizing scores predicted anxiety disorder diagnosis 14 years later in a sample of 1,474 Dutch children 4 to 16 years old, after controlling for age, gender and initial internalizing symptoms. Taken together, there is evidence that externalizing symptoms predict greater anxiety and depression for children in out-of-home care, but the relationship may vary over time as internalizing and externalizing symptoms change. Further research into the reciprocal nature of these relationships may provide additional insight beyond that of the current study.

Optimism. There is a fair bit of evidence supporting the protective effect of optimism in the internalizing problems of children in community samples, particularly for depression (Ames, Rawana, Gentile, & Morgan, 2013; Keyfitz et al., 2013; Smokowski et al.,

2014). While we could only find one study that partially examined this concept in child welfare samples (Bell et al., 2013), our study supports the protective effect of optimism in depression only. Keyfitz et al. (2013) found only a weak correlation between anxiety and positive schema (which included optimism), and findings from Bell et al. (2013) may be driven by symptoms of depression since they used the emotional problems scale from the SDQ, which includes symptoms of both anxiety and depression. Even in our depression model, the change odds of increased depression associated with less optimism was rather small, less than 1%. Despite this, optimism was one of the few protective effects in our final model for depression and therefore may be an important internal asset to children in out-of-home care.

Environmental factors. In the final models, both of the indicators classified as family factors (family functioning and trauma/maltreatment) were significant predictors of depression odds, while only trauma/maltreatment was relevant to anxiety scores. Within the trauma/maltreatment variables, each model had distinct predictors while emotional abuse showed overlap in both models. Placement type was a significant predictor in both models, with only minor differences between which placements predicted anxiety and depression. Finally, two additional environmental factors predicted depression score odds, community involvement and school functioning.

Family functioning. Our results support previous research that poorer family functioning is associated with increased depression for children in out-of-home care (Kaur & Kearney, 2013; Stoner et al., 2015). The two family items on the CANS used in our composite variable focus on the relationship between the child and their biological or adoptive families, rather than foster families or other caregivers. It appears that even

though children are removed from their families, these relationships remain an important factor in depression symptoms while in out-of-home care.

While Bell et al. (2013) examined the relationship between parent factors and emotional problems, it is possible their measure of emotional problems was a stronger indicator of depression than other emotional problems, as mentioned above. In addition, they examined the parenting practices of foster families, not biological families, which may impact internalizing problems differently than biological family functioning. Results from our anxiety model failed to detect an effect of family functioning on anxiety scores. No other studies have examined the role of family in anxiety disorders for children in out-of-home care. However, considering the results from Bell et al. (2013) it may be worthwhile to examine the role of foster families in the internalizing outcomes of children in out-of-home care separately for anxiety and depression.

Since almost half of the assessments in this sample were from placements other than foster or treatment foster care, more broadly defined sources of attachment may be of value to examine in out-of-home samples. Salazar, Keller, and Courtney (2011) examined social support in relation to depression outcomes for 513 youth exiting the child welfare system. They found that social support (e.g. how much various forms of social support are available) predicted later depression scores, and moderated and partially mediated the effects of maltreatment on later depression. Their results suggest examining social support or the quality of other attachment relationships may be an important factor in internalizing symptoms for children in out-of-home care when specific foster parents/caregivers are not available due to children's placement.

Trauma/maltreatment. The relationship between child maltreatment and internalizing problems appears to be complex. Several trauma/maltreatment items were significant predictors in both our models. However, the types of significant maltreatment differed between models. While emotional abuse was associated with both more severe anxiety and depression, sexual abuse and witnessing school violence was exclusively associated with anxiety; and medical trauma, witnessing family violence, and total trauma/maltreatment were exclusively associated with depression. Physical abuse and neglect were not related to change in odds of either outcome.

The lack of effect of physical abuse and neglect is supported by findings from McMillen et al. (2005) who found no individual effects of sexual abuse, physical abuse, and physical neglect on depression levels in a sample of older youth. However, they did observe that greater depression was associated with multiple maltreatment experiences, similar to our findings for total trauma/maltreatment in the depression model. However, McMillen et al. (2005) did not investigate other forms of maltreatment, trauma, or symptoms of anxiety. Similarly, Kennedy et al. (2009) found that family violence and school/community violence was associated with increasing anxiety in children whose families had experienced intimate partner violence. In our sample, only school violence was associated with anxiety scores. However, Kennedy et al. (2009) also did not control for various forms of child maltreatment, PTSD, or other forms of trauma.

Of particular interest, medical trauma and witnessing family violence was associated with lower odds of serious depression. It is possible that children who have witnessed family violence have lower depression scores after removal from the home, and therefore removal from the episodes they were witnessing. Munson and McMillen (2010)

found that the high but decreasing depression class had a higher proportion of youth who had experienced each type of maltreatment compared to the other classes. While this study only examined physical abuse, sexual abuse and physical neglect, it provides some support for our family violence findings, that it may be the result of children's depression scores decreasing after removal from homes high in interpersonal violence/maltreatment.

In a sample of 68 children aged 5 to 18 admitted to hospital in London, England, researchers found no significant differences in depression or anxiety scores (aside from PTSD) six to 12 months post-discharge between children admitted to the pediatric intensive care unit and children admitted to the general pediatric ward (G. Rees, Gledhill, Garralda, & Nadel, 2004). This study suggests no long-term psychological effects associated with serious medical trauma, aside from PTSD. If children in our sample were removed from their homes for reasons in part due to this medical trauma it might explain why they have lower depression scores than the overall sample mean, since other children may have been removed from their homes resulting from other types of trauma/maltreatment that are associated with greater depression.

The way in which maltreatment is examined and categorized in other studies may explain the divergent results observed in our study. Other studies have categorized children based on a "primary" type of maltreatment experienced (Heneghan et al., 2013; Rayburn et al., 2016), and/or reduced maltreatment categories based on prevalence rates or latent classes (Heneghan et al., 2013; Orton, 2008). In some cases only total trauma is investigated (Rosenberg et al., 2014). While emotional abuse was significant in both of our models, it is often left out, or included in an "other" category when investigating maltreatment in child populations (Heneghan et al., 2013; McMillen et al., 2005; Rayburn et

al., 2016). By excluding or combining various forms of maltreatment and trauma investigators may not be capturing the bigger picture of maltreatment/trauma. At the very least, other forms of maltreatment and trauma should be controlled for. By including a larger number of maltreatment and trauma types into a single model, we attempted to gain a more detailed understanding of which types of child maltreatment and trauma experiences are most related to anxiety and depression in children in out-of-home care. For those trauma/maltreatment types with low prevalence in our sample (i.e. community violence, war, terrorism, disaster, criminal activity), they were partially accounted for by including them in the cumulative “total trauma” composite score.

Community. While our depression model supports previous research in the positive effects of community involvement on internalizing problems, our model for anxiety does not. We found that a poorer connection to the community was associated with increased odds of serious depression. However, this effect may be confounded by placement type, since residential and institutional placements were also associated with increased depression in our sample and children are more likely to lose their connection to the community when placed in these types of settings. While including placement types in our model controls for placement type when looking at the other factors in the model, the CANS item for community life identifies being placed in a residential setting as possible criteria for a score of 3 (indicating no connection to the community) which could introduce a confounding effect. However, the same effect of community wasn't seen in the anxiety model where placement type was also significant, therefore we can assume the findings regarding depression were not due to this confound.

Despite evidence that internalizing problems, including anxiety, might be higher in neighbourhoods with a negative social climate (Caughy et al., 2008), we did not observe an effect of connection to the community and anxiety scores. It is possible that for children in out-of-home care, other factors present in our model play a larger role in the severity and improvement of anxiety symptoms.

Placement. Although the CANS item “living situation” was not significant in either model, indicating children’s adjustment to their current placement did not affect the odds of anxiety or depression severity, several placement type variables were significant predictors in both models. Our models confirm results found by previous studies that children in residential care experience significantly greater anxiety and depression than children in foster care (Damjanovic et al., 2011). Even when comparing children in residential treatment to therapeutic foster care, similar differences are observed (Baker et al., 2007). In our study, we took a more detailed look at placement types and internalizing scores. In both models, residential care, residential treatment, and institutional placements were associated with increased odds of serious anxiety and depression. Also, for both anxiety and depression the largest increase in odds were seen in the residential treatment and institutional placements compared to children in foster care. This is not surprising as the institutional category also included children in psychiatric inpatient care who would likely be receiving treatment for the same disorders we examined.

In addition, treatment foster care and placements classified as “other/unknown” significantly predicted greater odds of anxiety, but not depression. Treatment foster care is the least restrictive of the treatment/institutional placement types. It is possible that, in terms of depression, children experience these foster homes in a similar way to regular

foster care and kinship care placements, while anxiety is elevated in treatment foster care placements. It is also possible that anxiety symptoms are more readily detected in treatment foster care placements over regular foster care and kinship care. Treatment foster care parents are provided with additional training in order to better address the needs of children placed in these settings (Chamberlain, 2002). It is possible these parents are better equipped to detect the more subtle signs of anxiety problems compared to behaviour problem symptoms which are often more overt. Regarding placements classified as “other/unknown,” approximately 55.8% of the placements in this category were various forms of temporary/emergency settings. Although we were unable to examine number of placement changes in the current study, we might take these findings as preliminary evidence that frequent placement changes (i.e. temporary placements) predict more serious anxiety for children in out-of-home care.

School functioning. Our findings support previous research indicating school functioning is related to depression scores. Although Stoner et al. (2015) found the CANS school functioning items as their final significant predictor for depression, the increase in odds of serious depression associated with worse school functioning in our model was relatively small. The procedure used by Stoner et al. (2015) slowly removed participants and predictors from the model, while our analysis retained all participants and predictors, despite a lack of significance. Our results indicate that with other more impactful predictors in the model, the effect of school functioning is rather small, although significant, for depression odds. Removal from the home environment can be associated with disruptions in school functioning, however it is not clear whether disrupted school leads to depression

or depression resulting in removal from the home leads to poorer school functioning, this potential reciprocal relationship will be examined in Study 2.

Our review of the literature failed to reveal a strong link between anxiety and school functioning in children in out-of-home care, which was reflected in our model for anxiety. Despite some evidence that school strengths are negatively correlated with psychological symptoms for children in residential care (Lyons et al., 2000), it does not appear that school functioning is related to anxiety in particular.

Demographics. From the demographic items, race only predicted changes in anxiety score odds, while gender and age predicted changes in depression score odds. The quadratic trend across age was significant for both anxiety and depression.

Age. The results regarding age were discussed in detail in the discussion of hypothesis 1. It appears that, overall, anxiety remains relatively stable over time with some increase, followed by an equivalent decrease in scores across childhood and adolescence.

For depression, age remained a significant predictor in the final model. As mentioned in the discussion of hypothesis 1, these findings are similar to those found in child community samples (Fernandez Castelao & Kröner-Herwig, 2013). However, in our study, a one-year increase in age was associated with only a 0.62% increased chance of a 2 or 3 CANS depression rating, with a similarly small quadratic trend in ratings across age to that of anxiety. Considering other model predictors, the increase in depression we observed across age is small.

Gender. Our findings are in line with research in other out-of-home child and adolescent samples, where females tend to have more severe depression scores than males (Guibord et al., 2011; Handwerk et al., 2006; Hussey, 2008). In our study, being male was

associated with a 0.86% decrease in the chance of having a 2 or 3 CANS rating. Similar to the change associated with age, this is a relatively small decrease in depression compared to other predictors in the model. However, it was necessary to control for gender effects in both models as gender differences are often observed in depression and anxiety research in general.

Our model for anxiety did not show a significant effect for gender. While evidence exists that females in out-of-home care experience greater anxiety than males (Handwerk et al., 2006; Hussey, 2008), Kennedy et al. (2009) did not find an effect for gender on the anxiety trajectories of children who have witnessed family and community/school violence. The studies that did find gender differences both investigated internalizing problems in residential care samples, while the children in Kennedy et al. (2009) had not been removed from their homes. Considering the fairly low mean for anxiety scores in our sample, it is possible these children are more similar to community samples than the residential samples in Handwerk et al. (2006) and Hussey (2008). However, gender differences are typically observed in community adolescent samples as well (where females are at greater risk) for both mood and anxiety disorders (Merikangas et al., 2010). It is possible that other factors that place females at greater risk of anxiety are accounted for in our model. For example, it has been suggested that women react to stressful events differently from men, leading women to have greater anxiety (McLean & Anderson, 2009). Therefore, it is possible that by including traumatic stress and traumatic experiences we accounted for gender differences in the model, rendering the gender variable non-significant.

Race. Finally, racial differences were observed in the anxiety model, but not the model for depression. In our anxiety model, Caucasian children had a 3.09% increased

chance of having a 2 or 3 CANS anxiety rating compared to African-American children. These results are similar to that of Heneghan et al. (2013) where they found African-American adolescents significantly less likely to report symptoms of anxiety compared to Caucasian, Hispanic, and “other” ethnicities in a sample of children whose families had been investigated by the U.S. child welfare system. Our results differed from Heneghan et al. (2013) in that being classified as “other/unknown” (i.e. American Indian, Asian, Native Hawaiian/Pacific Islander, unable to determine, and missing) in our study did not have a significant effect on anxiety odds compared to African-American children. This might be because of the small number of children classified in this group, only 4.2% of the sample. Similarly, Hispanic origin had no effect on anxiety odds. Again this may be the result of a small number of children being identified as having Hispanic origin (6.7%) in our sample.

While several studies have found racial differences in depression scores for children in contact with the U.S. child welfare system (Grape, 2013; Orton, 2008), other studies contradict these finding (Heneghan et al., 2013). Our results are most similar to that of Heneghan et al. (2013), where no racial differences were seen in regards to depression scores, while anxiety scores differed between races in a similar way.

Time in care. As mentioned in the discussion of hypothesis 1, time in care significantly predicted lower odd of having a 2 or 3 depression rating only. This is in line with other research presented in the discussion of hypothesis 1 (Munson & McMillen, 2010; Orton, 2008). However the effect of time in care was much smaller in the final model for depression. In the model from hypothesis 1, one month in care was associated with a 0.07% decrease in the chance of serious depression, while in the final model with all predictors, one month in care was associate with a 0.03% decrease in the chance of a 2 or 3

CANS depression rating. While statistically significant, this is a relatively small decrease in depression associated with time in care once other time-varying predictors are included. For anxiety, time in care was not a significant predictor in the final model, suggesting other variables in the model are accounting for the variation in scores originally observed in the unconditional model. This non-significant trend across time is supported by research in community samples, where anxiety scores tend to be low and stable over time/age (Broeren et al., 2013; Feng et al., 2008).

Non-significant predictors. The fact that several predictors were found to be non-significant in both models is also interesting. The environmental factors that were not significant in either model include: acculturation, children's adjustment to current placement, and social functioning. The internal items that did not predict either anxiety or depression were: talents/interests, spirituality, health, recreation, and substance use.

Substance use. Despite plenty of evidence in clinical and out-of-home samples showing a link between substance use/abuse and internalizing problems (Kendall et al., 2004; Rosenberg et al., 2014), we did not find a relationship between substance use/abuse and increased odds of anxiety or depression. This lack of effect may be due to the age of our sample. In community samples, the median age of onset for substance use disorders is 20 years, but can start as early as age 15 (Ronald C. Kessler et al., 2005). While our sample ages ranged from 5 to 21 across all assessments, the grand mean for age across all participants was 14.4 (SD = 3.8). Considering our mean age was slightly below the lower limit for age of onset in the general population, it is possible our sample is too young to have experienced serious substance use/abuse. In addition, the mean substance use score was 0.25 (SD = 0.52) indicating the majority of children exhibited no signs of substance use

or a history/suspicion/mild level of substance use. The studies that found significant effects for substance use all examined samples of adolescents, where the lower age limits ranged from 9 to 17 years (Boger et al., 2014; Kendall et al., 2004; Munson & McMillen, 2010; Rosenberg et al., 2014), much higher than our lower limit of 5 years.

Health. While physical disabilities and medical illness have been linked to greater internalizing problems for children in out-of-home care (Berg et al., 2015; Woods et al., 2013), health/medical problems did not predict a change in odds for depression or anxiety in our study. The health/medical item and medical trauma item were only moderately correlated in our sample ($r = .38, p = .01$). However, since medical trauma was a significant predictor of changes in depression odds in our study, it is possible that any effect related to the health/medical item of the CANS was better accounted for by the experiences captured in the medical trauma item.

Talents/interests, spirituality, and recreation. While previous research supported the inclusion of several protective factors, talents/interests, spirituality, and recreation did not emerge as significant factors towards resilience against internalizing problems for children in out-of-home care. In fact, in the model for anxiety, none of the included protective factors were found to predict changes in odds of serious anxiety. Gillian (1999) noted that their findings regarding talents and interests may have been related to the connection children made to individuals outside of the child welfare environment rather than the activities themselves. Our findings may provide support for this idea regarding depression symptoms, since community involvement was significant in the depression model. It is possible that the effects we may have observed for other resilience factors were

better accounted for by including the effect of community in the model. However, this does not explain the lack of findings in protective factors for anxiety.

It is also possible that the cumulative effect of protective factors is more influential than any one particular “strength.” As seen in Stoner et al. (2015) a composite score of the CANS youth strengths items was the third best predictor of reduction in depression in a subsample of children and adolescents in foster care. While their analysis methods were quite different from the current study, the measures and sample were similar. Including a cumulative measure of strengths may provide additional insight into the anxiety and depression outcomes of children in out-of-home care in future research.

Acculturation. While research in community samples suggest acculturation explains some variance in internalizing scores (Sam, 2000; Yeh, 2003), studies conducted in child welfare samples are less consistent (Anderson & Linares, 2012; Kaur & Kearney, 2013). Our results did not show a significant impact of acculturation on either internalizing problem. This may be due to including stronger internalizing predictors in the models, or because acculturation does not affect children who have experienced trauma, maltreatment, and removal from their homes in the same way as children in the general population. In our sample, acculturation displayed a grand mean of 0.07 (SD = 0.20), near zero. On the CANS, a score of zero on acculturation is indicative of healthy integration of one’s own culture and the dominant culture in society (in this case Western culture). However, the CANS assesses acculturation in relation to overall experiences by children and their families in society, rather than the potential discrepancy in cultures when children are placed in out-of-home settings. Therefore, our measure of acculturation may not be capturing the source of

potential acculturative stress that may impact the internalizing symptoms of children in out-of-home care.

Adjustment to placement. Several placement type categories were significant predictors of both anxiety and depression in our study. However, children's adjustment to their current placement/living situation did not appear to be relevant to either anxiety or depression scores. This suggests there may be factors outside of a child's adjustment to their placement contributing to the relationship between placement type and internalizing problems. Understanding whether children begin to experience anxiety and depression before or after placement in these settings may provide additional insight into our findings. The possible reciprocal relationships between placement type and internalizing problems will be explored in detail in Study 2.

Social functioning. Despite evidence in both community and out-of-home care samples that social functioning and relationships are important protective factors for internalizing problems, in our models social functioning did not predict anxiety or depression odds. This was surprising in both cases. There is a clear link between social functioning and anxiety in both community (La Greca & Harrison, 2005) and out-of-home samples (Legault et al., 2006), where social aspects account for between 17 and 27% of the variance in anxiety scores. While children in out-of-home care have greater social difficulties (Bolger et al., 1998), it is possible that this is not a major source of anxiety. The type of anxiety experienced by children in out-of-home care may be more related to traumatic stress and general worries about placement, placement stability, and the future. Considering the language overlap discussed earlier in the CANS anxiety and avoidance

items, the anxiety item may be more related to traumatic stress than other anxiety disorders.

While there was some support from previous research that social functioning may predict depression scores in children (Settipani & Kendall, 2013), in our depression model there was no relationship between social functioning and depression odds. This was particularly surprising in light of our findings that community connectedness did predict depression odds. Considering there is a social component to community connectedness, we would expect both factors to predict depression in a similar way. There was a moderate to strong correlation between community involvement and social functioning in our sample ($r = .61, p = .01$). However, our results suggest there is some other aspect regarding community connectedness that predicts depression outside of socializing. Berrick (2006) argues that foster placements should be made in children's own neighbourhoods when possible. They list many benefits to a child's neighbourhood beyond that of social connections, including minimizing academic disruptions, cultural continuity, and higher chance of reunification with biological parents as a result of increased ease of visitation with proximity. Therefore, there may be a far more holistic benefit to community connectedness not yet explored.

Implications

There are several overall implications resulting from this study. First we evaluated an exploratory model of resilience in relation to the risk and protective factors for internalizing problems. Second, we found distinct models for anxiety and depression. Third, we gained further understanding of the role of protective factors in comprehensive models for anxiety and depression.

Kumpfer's model. We proposed a modified version of Kumpfer's (1999) resilience model, adapted to reflect risk and protective factors associated with anxiety, depression, or internalizing symptoms more generally. Kumpfer's original model included family, community, culture, school, and peers as external environmental factors and spiritual, cognitive, social/behavioural, physical, and emotional/affective internal factors. As displayed in Figure 1, we aimed to maintain this general structure while including indicators for each area that are specific to internalizing symptoms. Although factors were selected from previous research, the overall interpretation of Kumpfer's (1999) framework was somewhat exploratory in nature, based in part on available data.

Overall, the environmental factors associated with internalizing outcomes included family, community, out-of-home placement, and school, while internal factors included cognitive, behavioural, and emotional functioning (Figure 4). In contrast to Kumpfer's (1999) proposed model, not all areas of resilience significantly contributed to anxiety or depression odds. In terms of environmental factors, acculturation and social functioning did not play a role in either model. Similarly, the internal factors representing spirituality and physical health (i.e. health and recreation) were not significantly related to either outcome. These findings may suggest that the measures used in this study did not capture these constructs in a way that is relevant to internalizing outcomes. For example, as mentioned earlier, the CANS acculturation items are completed in relation to the child's/family's general acculturative experiences. The items are not completed in relation to the child's out-of-home placement or school and a more relevant source of stress may be the relation of a child's cultural identity to their placement environment (M. Anderson & Linares, 2012). Another example is that our measure of spirituality was much more literal

than the construct outlined by Kumpfer (1999) who includes various cognitive strengths as spiritual indicators. Our findings may also indicate that, while Kumpfer's (1999) model may capture the components relevant to overall functioning and resilience across development, when examining a specific outcome like internalizing symptoms careful model refinement is necessary. Our results provide an initial overview of those factors with the strongest associations to internalizing outcomes in children in out-of-home care, as well as factors of lesser importance. These factors should be considered in future model development, as well as exploration of alternate models.

Distinct models for anxiety and depression. In Figure 4, we see that the anxiety and depression models have several factors in common, but that each model also contains factors specific to each outcome. Optimism, family, community, and school functioning uniquely predicted depression odds, while sexual abuse, witnessing school violence, and placements categorized as treatment foster care or "other/unknown" uniquely predicted anxiety. Many studies involving child welfare samples lump internalizing disorders together (Augenbraun, 2004; Bell et al., 2013; McWey, Cui, et al., 2010; Rayburn et al., 2016), however, this study provides evidence that they should be addressed individually as clear differences between models were observed.

For depression, most of the included factors significantly predicted the odds of depression ratings. These findings suggest that a multifaceted approach to preventing and treating depression in out-of-home populations may be the most effective. Interventions such as Multidimensional Treatment Foster Care have been gaining popularity in overall resilience building. This type of intervention includes training and support at individual, family, and agency levels in several areas in order to foster improved outcomes in

children's social, school, and behavioural adjustment, as well as reducing caregiver stress. Considering the diverse areas associated with depression odds in the current study, Multidimensional Treatment Foster Care may also be effective in reducing and preventing depression symptoms in out-of-home care populations.

Our final model for anxiety included few significant predictors of change. In addition, evidence from our first research question suggests anxiety is fairly stable across time in care and age in this sample. Taken together, these findings suggest there may be an issue in detecting and/or treating anxiety in this population. The few internal predictors that were significant (i.e. traumatic stress, depression, and externalizing) may be addressed under the Multidimensional Treatment Foster Care intervention mentioned above, which may in turn impact anxiety symptoms as well. Thus far, few studies have examined anxiety alone in out-of-home samples. Due to this lack of previous research, our model for anxiety included several items based on research on depression or a combined measure of internalizing symptoms as the outcome of interest. The more exploratory nature of the anxiety model might explain why fewer predictors successfully predicted odds in anxiety compared to depression. It may be of interest to further explore other possible factors involved in the anxiety outcomes of children in out-of-home care by exploring other models or interaction effects of the factors already included. For example, Leenarts et al. (2013) found that symptoms of PTSD mediated the effect of trauma on mental health (including anxiety and depression), in a sample of 92 female adolescents in residential care. Exploring interaction effects such as this might provide greater insight into the mechanisms behind the development and stability of anxiety in out-of-home populations. Another possibility is that there is a more systematic issue of detection present. The generally low and stable

scores observed in this study may represent a difficulty in detecting anxiety symptoms in this population. Using parent, teacher, and self-report versions of the Strengths and Difficulties Questionnaire, researchers found anxiety disorders were detected only 50.5% of the time (sensitivity ranged from 30.9 to 75.0% depending on the type of anxiety disorder) in a community sample of 7,984 British children 5 to 15 years old (Goodman, Ford, Simmons, Gatward, & Meltzer, 2003). They found that sensitivity rates for detecting anxiety disorders were lower than rates for detecting externalizing problems (75.4% – 86.1% sensitivity) or depression (74.6% sensitivity). These researchers further found that detection was worse when not all sources of information were available (i.e. only teacher or parent completed measures). While individuals completing CANS ratings use multiple sources of information, a similar lack of detection might be present in our study. In cases where anxiety is suspected (i.e. a CANS score of 1) more careful screening and evaluation may be warranted. However, this also raises an issue of time and financial burden on children, families, and the child welfare system.

Protective factors. When examining each model separately, factors in the depression model explained the change in scores slightly better than in the anxiety model; however, neither model included many strengths/protective factors. The focus in resilience research is on positive factors in building resilience, while not discounting risk factors (Kumpfer, 1999; Masten, 2011). However, much of the research on resilience models include mainly positive factors, with only one or two risk factors, or a single cumulative risk measure included as a control (Ames et al., 2013; Bell et al., 2013; Guibord et al., 2011; Legault et al., 2006). Our study included a more comprehensive set of predictors, both risk and protective, compared to other studies of this type. With a more complete set of risk

factors included, very few protective factors significantly predicted the odds of anxiety or depression. In addition, the change in odds associated with risk factors (such as externalizing, traumatic stress, and co-occurring anxiety/depression) were much larger than those associated with significant protective factors (such as optimism or community). Our findings suggest that after accounting for significant risks, protective factors play a relatively small role in the depression and anxiety outcomes for children in out-of-home care. Further exploration of these findings is warranted, including the possible effects of cumulative strengths over individual protective factors as examined in our study.

Limitations

There are several limitations to this research. Specific to Study 1, there are some limitations due to the ordinal analyses chosen, as well as several factors not included in the models due to data limitations. There are also limitations regarding common method variance and reliability; these limitations apply to both Study 1 and Study 2 as the same data and measures are used for both studies.

Ordinal analysis. The selection of an ordinal analysis provided several benefits in the current study. While the CANS can be analyzed as a continuous or dichotomous measure, we elected to use an ordinal analysis. By selecting an ordinal structure rather than dichotomizing the outcome measures, we retained more information for analysis. In addition, an ordinal cumulative probability regression model provides the cumulative odds needed to co calculate the probability of increasing from non-actionable to actionable CANS ratings (i.e. from a 0 or 1 to a 2 or 3). However, because level-1 variances are not calculated in ordinal HLM, this method does not provide the coefficients or chi-squared statistics necessary for model fit comparison or the coefficients needed to calculate the amount of

variance explained by a particular model. Therefore, we could not infer how well each model fit each outcome of interest, or compare this fit between the two models for anxiety and depression. Future research using a continuous outcome may provide additional insight into model fit for internalizing outcomes of children in out-of-home care.

Factors not included. Another limitation, despite the large number of predictors in each model, was that several key predictors had to be excluded. In their review, Orme and Buehler (2001) suggest there are several aspects of foster caregivers that may be related to children's emotional problems. They found internalizing or emotional problems related to foster families parenting (i.e. parental acceptance, attachment, relationship quality, and over all treatment of children), home environment, and family functioning. While family functioning was examined in our model, this factor related to children's biological/adoptive families rather than foster families. Unfortunately, in our sample current caregiver items were 27.7% to 28.1% missing. This large amount of missing data may have been due in part to the child's placement at the time of assessment; some children were in placements that may not have had a primary caregiver to evaluate (i.e. runaway, shelter, whereabouts unknown). As a result we were unable to include current caregiver factors in our models. However, considering the importance of foster family characteristics in the emotional well-being of children in foster care (Orme & Buehler, 2001), factors related to foster families warrant investigation in future research.

There is a body of research indicating that number of placement changes is associated with increased mental health problems, including anxiety and depression (Fawley-King & Snowden, 2012; Koh et al., 2014). While we were able to include placement type at each assessment, we did not have data on placement changes within the same

category (i.e. child changing from one foster home to another) and therefore were not able to include number of previous placements at each assessment in our model.

Number/frequency of placement changes should be included in future models for anxiety and depression for children in out-of-home care.

Finally, there is some evidence that later age of entry to out-of-home care may be a protective factor against maladaptation (Rees, 2013). In our study, age at removal from the home was not highly correlated to mean time in care child or mean age for each child. The modest negative correlation between age at removal and time in care suggests that the older a child is at removal, the less time they spend in care. However, including all three variables in our models created a near singularity, indicating multicollinearity between predictors and therefore we could not include all three variables in our study. Since time in care was of primary interest in hypothesis 1, and age was required to control for developmental changes with age, we retained these variable in the final model rather than adding age at removal as a time-stable level-2 variable.

There are other variables that could have been included as predictors of anxiety and depression in addition to those selected in our models. However, the three listed above are those that appeared most frequently in the literature that we were not able to include. Future models for the internalizing problems of children in out-of-home care should investigate these areas for possible importance in resilience against serious internalizing problems.

Common method variance. Our studies are based almost entirely on data from a single measure, the CANS, which is typically completed by a single rater. Using both predictor and outcome variables from a single measure can pose a problem of common

method variance (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). Common method variance is variance that can be attributed to a measurement method, rather than the constructs the measure is intended to quantify. Podsakoff et al. (2003) suggest several remedies to common method variance, which can be applied to the CANS to minimize the possibility that results were due to this confounding effect.

The first method is to obtain predictor and outcome variables from different sources (Podsakoff et al., 2003). While the CANS is completed by a single rater, the information used to complete the CANS is gathered from several sources including the child, family members, foster parents, social workers, and other individuals involved in treatment and care. This method of combining diverse views to create a common measurement tool is referred to as pre-measurement triangulation (Obeid & Lyons, 2011). Much like traditional triangulation this method gathers data from several sources, thereby reducing bias and improving validity and reliability. However, because pre-measurement triangulation results in a single measure, the time burden, financial costs, and analytical challenges of traditional methods of triangulation are reduced (Obeid & Lyons, 2011). For example, the CANS can be completed during meetings or rounds to ensure multiple sources of information and consensus on ratings, while conserving time for the individuals providing information.

Another remedy is to separate predictor and outcome variables by collecting the information at different times (Podsakoff et al., 2003). While Study 1 used all data from each time point, a lagged method is used in study 2. Therefore this remedy to common method variance will be discussed in detail in Study 2. Other solutions include counterbalancing questions and improving scale items (Podsakoff et al., 2003). As a

communimetric measure, the levels of each CANS item are meant to be meaningful in and of themselves, therefore the scale and language used on items are well understood by those completing and using CANS assessments. Similarly, counterbalancing (including items/questions that contradict each other) is not necessary as CANS raters are trained to complete the measure and have a full understanding of each item as defined in the manual provided at training.

Finally, several studies have used CANS items and subscales successfully as both predictor and outcome measures (Cordell et al., 2016; Dunleavy & Leon, 2011; Epstein et al., 2011; Stoner et al., 2015). Other studies have used similar and widely accepted measures of internalizing and externalizing symptoms as both predictor and outcome in a single analysis (i.e. CBCL; Aarons et al., 2010; Weeks et al., 2016).

Missing data. As discussed above, research suggests various aspects of foster caregivers, such as parenting, home environment, and family functioning, may be related to children's emotional problems (Orme & Buehler, 2001). Unfortunately, in our sample current caregiver items were 27.7% to 28.1% missing and as such were not included in analyses. A missing value analysis showed the caregiver items missingness was significantly related to participant ID, anxiety, depression, and almost all other study variables. While this is an indication of data being missing at random (MAR), and imputation methods such as multiple imputation or the expectation-maximization algorithm work well with data that is MAR (Bennett, 2001), due to the nature of the data there is reason to suspect caregiver items are missing not at random (MNAR). When caregiver items were missing, they tended to be fully missing by assessment and often by child as well. The missing value analysis also showed them to be significantly missing by

placement type, which makes sense given certain placements may not have one primary caregiver for whom to base the caregiver items on. Although the MNAR mechanism cannot be proven directly, as it is based on data that is not available, it is reasonable to assume caregiver items may not be completed due to the nature of the caregiver (e.g. institutional settings, independent living). In this case, where data is suspected MNAR because it is related to the items themselves, imputation methods such as multiple imputation or the expectation-maximization algorithm produce extremely biased estimates (Bennett, 2001). For this reason, caregiver items were not imputed or included in analyses.

The second area where missing data was problematic was for placement type. As described earlier, placement type was missing for 10.6% of assessments. While regression based imputation methods are a preferred method for producing unbiased estimates for continuous as well as categorical/dichotomous variables, best practice suggests not rounding imputed values for dichotomous variables as it introduces bias (Allison, 2005). However, because placement type is used as an outcome variable in Study 2, rounding would be necessary for dichotomous placement type outcomes and therefore regression-based imputation is not ideal. While other imputation methods are possible for categorical data (i.e. logistic imputation), the current data did not meet the requirements for this type of imputation, as described in our methods section. As such, in order for results to be comparable across studies, missing data on placement type was not imputed.

Future Directions

There are several areas of interest uncovered in this study. As mentioned above, the model for anxiety did not reveal a large number of significant predictors, particularly those considered strengths or those that contribute to greater resilience. Future studies should

build upon the anxiety model presented here in order to better understand the risk and resilience factors related to anxiety problems for children in out-of-home care. Also, as mentioned in the limitations, several potential predictors could not be included for practical reasons, which warrant further investigation in future studies. Two other areas of future research in particular deserve mention: the reciprocal nature of predictor and outcome variables, and class analyses that include a larger number of predictors.

Reciprocal relationships. Since we were examining time-varying factors as predictors of anxiety and depression, it is important to consider that a temporal sequence or a reciprocal feedback relationship might exist between these variables. For example, in the literature review on substance use and depression, some studies indicated depression levels affect later substance use (Boger et al., 2014), while others found substance use to be related to future depression (Munson & McMillen, 2010). Although substance use did not emerge as a significant risk factor in our models, it is possible that similar reciprocal relationships exist for other risk and protective factors in our models. In order to better understand how these risk and protective factors contribute to internalizing problems, analyses lagging the predictor and outcome variables and examining the relationship in both directions (i.e. interchanging the dependent and independent variables) would be of interest. This concept will be explored in detail in Study 2.

Class analyses. In our study, depression showed very small amounts of change over time in care. And while both outcomes displayed a small quadratic trend, only depression also showed a small linear increase across age. While these findings could be representative of low-stable scores over time, it is also possible that examining a single group trajectory is missing the change in scores over time because different groups of

children display trajectories that change in unique ways over time. For example, if there are three major depression classes as found in Munson and McMillen (Munson & McMillen, 2010) where some children have low but increasing depression, others high and decreasing, and finally those who have low and stable depression scores across time, we would miss these changes entirely in a single group analysis because the low and high groups would essentially cancel each other out, and only the steeper slope would emerge as significant. This possibility in our data is supported by the high lifetime prevalence rates we observed in both anxiety and depression, while overall means were low. The quadratic trend across age observed in both models may also be an indication of different trajectory classes across age. We selected an HLM analysis with time-varying predictors in order to benefit from the rich amount of data available in this sample and take into account that many predictors can fluctuate over time. Current methods of latent class analysis only allow for time-varying predictors as “pivot points” in the data (i.e. not present/present) and does not allow for fluctuations back and forth over time. However, it might be possible to create latent classes and then segregate the sample into smaller subsamples by trajectory before applying the modeling methods used in our study. This would be a valuable area of research to better understand internalizing trajectories for children in out-of-home care.

Conclusions

The complex models presented in this study were an attempt to understand the process of resilience for internalizing problems in children in out-of-home care. A large number of predictors were included in order to mimic the multifaceted aspects of children in out-of-home care. Further, by using a hierarchical model with time-varying predictors,

we attempted to capture the dynamic nature of child development, recognizing that many facets of a child can change over time and affect internalizing symptoms in various ways.

From the above discussion, it is apparent that there are some similarities between the models for anxiety and depression in children in out-of-home care. However, each model displays unique predictors for their respective outcomes. These models offer a unique perspective in addressing anxiety and depression problems for children in out-of-home care. As mentioned above, many studies lump internalizing disorders together and our study provides evidence that they should be investigated individually as clear differences between models were observed.

Our depression models show depression odds decrease over time in care while increasing with age, and the majority of included factors predicted changes in odds of depression. These overall findings suggest multifaceted treatments, such as Multidimensional Treatment Foster Care may be useful in fostering resilience towards depression, and child functioning more generally for children in out-of-home care.

The model for anxiety included far fewer relevant predictors compared to the depression model. This is likely due in part to a lack of research to date examining anxiety alone in out-of-home child populations. Our findings suggest further evaluation of anxiety in cases where it is suspected may be beneficial for improved detection and treatment of anxiety in out-of-home populations. However, our findings also suggest that anxiety may be persistent over time, and with few relevant predictors, difficult to address.

Few protective factors (strengths) were found to be significant predictors in either model, particularly for anxiety. It's possible that the cumulative effect of protective items is

more influential than any one item alone. Considering the recent shift in focus from risk to resilience in child welfare, the effects of cumulative strengths should be further explored.

The process for model development was somewhat exploratory, based on earlier internalizing research, resilience theory, and limited by available data. This may have been why the proposed models did not fully explain the outcomes of interest. Despite this, they provide a starting off point to guide future research in understanding the anxiety and depression symptoms of children in out-of-home care. Both models provided new areas to explore in future research in order to improve the mental health outcomes of children in out-of-home care.

Study 2: The Reciprocal Nature of Factors Associated with Internalizing Resilience for Children in Out-of-Home Care

With the advancement of statistical techniques over the last decade, there have been an increasing number of studies examining the reciprocal nature between various psychological and environmental constructs. These reciprocal relationships may represent part of the resilience building process described by recent theories. As mentioned above, Kumpfer's (1999) resilience model contains two transactional components: (1) the interaction between the person and environment and (2) the resilience process itself as positive or negative adaptation is reintegrated back into future responses to other stressful events.

This second transaction point, the feedback process, can be described as the role of external environmental and internal factors as they protect against maladaptation in the presence of stress. When the stressor is too great, an imbalance between stress and resilience factors can occur, which might lead to maladaptation. However, the reintegration of positive adaptation can restore balance between the stressor and resilience factors where an individual returns to a state of homeostasis (Kumpfer, 1999). When the next stressor is experienced, the resilience process repeats. A similar process has been described more recently by Masten and Cicchetti (2010) as developmental cascades, where complex transactions between different domains of functioning influence other areas of functioning with a cascading effect over time.

Regardless of the label these cascading/reintegration/feedback processes are given, the process can be difficult to measure due to the complexity of the relationships between all the factors that may be influencing one another as well as the outcome itself. Kumpfer

(1999) suggests that conducting research on the mini-transactions between the individual and the environment that promote resilience is the best way to uncover areas to focus on when designing prevention programs. In line with this idea, examining the reciprocal relationships between risk/protective factors and subsequent internalizing problems individually may provide additional insight into which factors are most predictive on internalizing problems, which are more strongly predicted by internalizing problems, and which display a reciprocally predictive relationship over time.

Several studies have examined these reciprocal relationships for factors related to internalizing problems in children and adolescents. However, few studies have examined multiple factors in the same sample, using separate analyses. Weeks et al. (2016) examined the reciprocal relationships between internalizing, externalizing, and school achievement under a developmental cascades approach. They used a community sample of 6,425 Canadian children, 4 to 5 years old. Children were evaluated every 2 years for 7 waves in total (followed to age 16 - 17). Parent and child reported internalizing and externalizing items were pulled from the Child Behaviour Checklist and Ontario Child Health Study. Children also completed age appropriate academic tests (Picture Vocabulary Test-Revised for children 4 to 5 years old and the Mathematics Computation Test for older children/adolescents). Self-reported depression was also measured at age 16 to 17 using the CES-D. A multi-lag cascades model was used to test the reciprocal/bidirectional relationships between variables over time. They found that greater internalizing predicted greater future externalizing and vice versa, where greater externalizing also predicted greater future internalizing, suggesting a reciprocal relationship. Greater internalizing also predicted greater future academic performance, while lower academic performance

predicted greater future internalizing, suggesting a complex relationship where one path shows a positive association while the other is negative. Greater academic competence predicted lower future externalizing and greater externalizing predicted lower future academic competence, suggesting a negative reciprocal relationship. Externalizing also predicted greater future depression. Since depression was only measured at the final time point, reciprocal relationships between depression and other study variables could not be measured. Gender differences were also observed, where the path between externalizing and future depression was stronger in girls, and the path from internalizing to future externalizing was stronger in boys. The study also included several covariates (SES, parenting, family functioning, chronic illness in child, maternal depression, and stressful life events). However, inclusion of these covariates showed poorer fit and they were not included in the final model. This study suggests there are complex reciprocal relationships between internalizing, externalizing, and academic performance in children over time. These relationships will be discussed in more detail below; however, this study provides evidence that the reciprocal relationships between internalizing problems and related factors in children may be complex. These types of relationships are, thus far, rarely studied in out-of-home care samples. Since children in out-of-home care have often experienced greater adversity and stressful events, understanding the reciprocal relationships of internalizing problems and related factors may be of particular importance in understanding the process of resilience in this population.

In Study 1 several time-varying internal and environmental risk and protective factors were identified for internalizing problems in children in out-of-home care, within the context of an exploratory resilience model (Figure 4). Several factors were common to

both anxiety and depression: traumatic stress, co-occurring anxiety or depression, externalizing problems, and placement type. Other factors predicted depression only: optimism, family functioning, community involvement, and school functioning. Previous research on the reciprocal nature of these factors to anxiety and depression are discussed below.

Environmental Factors

The environmental risk and protective factors identified in Study 1, represented in Figure 4, include family functioning, trauma/maltreatment, community involvement, placement type, and school functioning. The trauma/maltreatment variables in Study 1 were treated as time-stable, measured at entry to care, therefore they will not be included in the reciprocal analyses in this study. Placement type was a common risk factor in both the anxiety and depression models, while family functioning, community involvement, and school functioning predicted odds of depression scores only.

Family functioning. Family functioning has shown to be a risk factor for depression in children in both community (Dooley et al., 2015) and out-of-home samples (Bell et al., 2013; Kaur & Kearney, 2013; Stoner et al., 2015). However, no studies have investigated the relationship between depression and future family functioning in out-of-home care samples; research from community samples have shown mixed results.

In some cases, only a unidirectional relationship has been found, where aspects of parenting/family functioning predict future child depression. Sheeber et al. (1997) examined family support, family conflict, and adolescent depression in a community sample of 421 adolescents, 14 to 20 years old from the United States. Results showed that family support negatively predicted depression one year later and family conflict predicted

greater depression one year later. The reverse relationships (depression predicting future family conflict and support) were not significant, suggesting only a unidirectional relationship between family functioning and child depression in community samples. Similarly, in a community sample of 976 American children, aged 13 to 14, Wang and Kenny (2014) examined the reciprocal relationship between parental harsh verbal discipline, conduct problems, depression, parental warmth, and parental stress across two school years. A cross-lagged panel analysis revealed that mother's and father's harsh verbal discipline in grade 7 predicted child's depression in grade 8, but grade 7 depression did not predict later harsh verbal discipline. Further, this relationship was not moderated by parental warmth. These studies suggest a unidirectional relationship where family functioning predicts later depression.

It is possible the reciprocal nature between family functioning and depression depends on the component of family functioning being measured. In a 5 year longitudinal study, Barbot et al. (2014) examined the reciprocal relationship between parental involvement, control, rejection, and stress and parents' perceived child adjustment (internalizing, externalizing, and social competence). The study included 361 at-risk mother-child dyads (low-income mothers with a history of substance abuse and/or internalizing problems), with children's ages ranging from 8 to 17 at the first measurement. In a cross-lagged regression model they found that only previous depression and maternal rejection predicted internalizing problems 5 years later. However, they also found that perceived child's internalizing problems predicted future parental stress, indicating the reciprocal relationship between internalizing problems and family functioning may depend on different aspects of family functioning. It is also possible that the reciprocal nature

between family functioning and depression is mediated by other aspects of child functioning. In a 6-year longitudinal study, Nelemans et al. (2014) examined reciprocal relationship between maternal criticism (self-report) and adolescent depressive and anxiety symptoms, with child's perceived maternal criticism as a mediator. The study sample consisted of 497 Dutch adolescents from the community followed annually for 6 years. They found that greater maternal criticism predicted greater future perceived criticism, and perceived criticism predicted greater future depression. They also found depression predicted future perceived criticism, and perceived criticism predicted future maternal criticism. These results indicate a reciprocal effect between maternal criticism and depression via perceived criticism. Results from Nelemans et al. (2014) and Barbot et al. (2014) suggest the reciprocal relationship between family functioning and depression may depend on the way in which family functioning is conceptualized and measured.

Other research findings suggest the reciprocal relationship between family and depression is only present in females (Boutelle, Eisenberg, Gregory, & Neumark-Sztainer, 2009; G. Lewis, Collishaw, Thapar, & Harold, 2014). Findings from Boutelle et al. (2009) and Lewis et al. (2014) suggest the reciprocal relationship between family functioning and depression is stronger in girls, and again, appears to depend on the specific aspects of family being examined, as well as which family members are being studied.

The possible reciprocal relationship between family functioning and child depression has not yet been evaluated in out-of-home care samples. However, research in other at-risk samples suggests the relationship between family functioning and depression may be bidirectional. Gutiérrez-Colina et al. (2017) examined family functioning and depression in a sample of 64 adolescent/young adult (14 to 21 years old) cancer survivors

and their families. The study assessed both parent and child reported depression and family cohesion/flexibility two years after completion of cancer treatments. Results showed that youth- and parent-reported depression each negatively predicted youth-and parent-reported family cohesion and flexibility, respectively. However, youth-reported depression did not predict parent-reported family cohesion or flexibility, and parent-reported depression did not predict youth-reported family cohesion or flexibility. Results from this study appear to be dependent on the respondent in question, indicating perceived family functioning may be more relevant to child mental health than actual family functioning, a concept supported by Nelemans et al. (2014) where perceived criticism mediated the relationship between parental criticism and depression longitudinally. Despite this, results from Gutiérrez-Colina et al. (2017) in conjunction with those from Barbot et al. (2014) suggest the relationship between family functioning and child depression may be reciprocal for at-risk children and families. However, children in out-of-home care may display different relationships over time compared to other at-risk samples. Since these children have been removed from their homes, the amount of contact with their families is reduced, which may reduce the possible reciprocal relationship between family factors and depression symptoms.

Community. Previous research has shown community involvement and community social climate are related to internalizing problems in community samples (Caughy et al., 2008). And community connectedness has shown a link to depression in at-risk samples (Rosenberg et al., 2014). In out-of-home care samples community connectedness has been shown to be related to positive development/resilience (A. L. Goldstein et al., 2013; Quisenberry & Foltz, 2013). In Study 1 we found a lack of community involvement

predicted the odds of more severe depression in a large sample of children in out-of-home care.

Since the unidirectional relationship between community involvement and depression has not been widely studied overall, it is not surprising that this association has not been examined within a reciprocal context. However, for developmental populations, school connectedness may be analogous to community connectedness. Since children spend a significant amount of time in school each day, forming a connection within this social environment may parallel a connection to the wider community for this population. Shochet et al. (2006) examined school connectedness and mental health symptoms in a community sample of 2,022 grade 8 students (12 to 14 years old) from New South Wales and Australia. They found school connectedness negatively predicted future depression one year later, but earlier depression did not predict later school connectedness. These findings suggest a unidirectional relationship between school/community connectedness and later depression.

Feeling connected to the community may be of particular importance for the depressive symptoms of children at-risk. In a cross-sectional community sample of 539 14-year-olds and their families in Sweden, Mahoney and Schweder (2002) examined the effect of after school community activities on depression. After school activities were defined as those activities involving other same-age peers with an adult leader that met at least once a week. Results showed depression scores were lower for children who participated in after school activities, and even lower for those that had a supportive relationship with the leader. When divided into low, moderate, and high parental attachment (defined by knowledge of/involvement in child's activities), the connection between activities and

depression was only observed in children with low parental attachment (bottom 20% of attachment scores). These results suggest a connection to the community may be of particular importance to children at-risk. Since children in out-of-home care are at greater risk of attachment and internalizing problems (Chesmore, Weiler, Trump, Landers, & Taussig, 2017), the relationship between community connectedness and depression may be particularly relevant to this population. The longitudinal study discussed above suggests a unidirectional relationship between community connectedness and later depression; however, resilience theory would suggest this relationship is reciprocal.

Placement Type. Results from Study 1 indicated greater internalizing problems were associated with different placement types, particularly the more restrictive placement settings, for children in out-of-home care. These results were supported by previous studies showing children in residential care and residential treatment settings experience significantly greater anxiety and depression than children in foster care and therapeutic foster care (Baker et al., 2007; Damjanovic et al., 2011). However, little research to date has examined whether internalizing problems are detected before or after being placed in more restrictive settings.

There is some evidence that internalizing problems are detected after entry into out-of-home care, while externalizing problems are detected prior to entry in to care (McMillen et al., 2005). This may be because the symptoms of internalizing problems are not as overt as those of externalizing behaviours. Once children enter the child welfare system, they are typically assessed in various areas of functioning, including mental health problems. In addition, parents of treatment foster care placements receive additional training in order to meet the needs of the children placed in their care (Chamberlain, 2002).

It stands to reason that internalizing problems may be detected after entry to care, or placement in more restrictive settings where caregivers might be more attuned to recognize internalizing symptoms.

Thus far, research suggests there may be a unidirectional relationship between placement changes and internalizing. Farmer et al. (2008) found that being male, having more severe behaviour problem scores (on the CBCL), lower strength scores, and more child risk factors predicted placement in out-of-home care in a sample of 3,066 children, 5 to 18 years old at intake. Further, having higher behaviour problem scores was the only significant predictor of being placed in more restrictive placements over foster care placements. Finally, they found more placement moves was associated with being older, male, having greater behaviour problem scores, lower strength scores, greater child risk history, and those with Hispanic ethnic origin. While this study did not distinguish between internalizing and externalizing behaviour subscales, it provides preliminary evidence that internalizing scores may predict placement setting type and frequency of placement changes. Similarly, in a sample of 500 children (2 to 15 years old) placed in out-of-home care in the U.S. child welfare system, Aarons et al. (2010) examine the reciprocal relationships between internalizing problems, externalizing problems, and placement changes across three years. In cross-lagged path analyses they found a reciprocal relationship between externalizing and number of placement changes over time, but only a unidirectional relationship between internalizing and subsequent placement changes. Age and gender effects were also observed. The paths between internalizing and later placement changes and the reciprocal pattern between externalizing and placement changes were only significant in the middle age group (6 to 10). The gender based analyses

produced new significant paths, where internalizing predicting later placement changes was only significant in boys, and a new path emerged in girls where placement changes at 18 months predicted internalizing scores at 36 months. Taken together, these results indicate an overall reciprocal relationship between externalizing and placement changes but a unidirectional relationship between internalizing predicting later placement changes, with results also varying somewhat across age and gender.

Other research does not show a direct relationship between internalizing problems and later placement changes. Rindlaub (2015) examined the reciprocal relationships between internalizing problems, externalizing problems, child-caregiver relationship, and placement changes in a U.S. child welfare sample of 1,179 adolescents, 11 to 16 years old. Assessments were conducted approximately every 6 months across 2 years (4 waves) after the initial child welfare investigation. Using cross-lagged analyses, they did not find any relationship between internalizing scores and placement changes, but did find that internalizing scores predicted lower future child-caregiver relationship scores. However, the lack of relationship may have been due to the fact that only 22.9% of children in the sample were placed in out-of-home care during the course of the study, and the average number of out-of-home placements for each child was 0.75 placements. Although 47.4% of the sample experienced 2 or more placements during the course of the study, these placements were not necessarily out-of-home placements. It is possible that internalizing symptoms are not related to placement changes between parents and other relatives/caregivers. A relationship between out-of-home placement changes and internalizing problems may not have been detected in this study due to the low prevalence of children in out-of-home care in the sample.

No studies appear to examine the internalizing effects of anxiety and depression separately in relation to placement changes or placement type. Based on the above studies, we might expect both anxiety and depression to have a unidirectional relationship with placement type, where internalizing scores predict future placement in more restrictive settings. However, since McMillen et al. (2005) observed that detection of internalizing problems often occurred after entry into care, a reciprocal relationship may be observed. From a resilience perspective, a reciprocal relationship could be expected, since difficulty in emotional and other functioning may lead to more restrictive settings, and placement restrictive settings may be a reflection of children having difficulty adapting to out-of-home care and therefore may predict further maladaptation in internalizing symptoms as well.

School Functioning. In longitudinal community samples, there is some evidence that the relationship between school performance and depression is reciprocal. In a longitudinal sample of 2,230 adolescents (10 to 18 years old) from a Dutch community, researchers found that an increase in depression scores on the Youth Self Report were correlated to a decrease in teacher-rated academic performance. However, only a weak correlation was observed at any time point (-.03 to -.12). They also found that in girls depression scores predicted later decreases in academic performance and better academic performance was associated with later decreases in depression (Verboom, Sijtsema, Verhulst, Penninx, & Ormel, 2014). Similarly, in a U.S. community sample of 130 grade 6 students (approximately 11 years old at the start of the study), Weidman et al. (2015) found a reciprocal relationship between depression scores and GPA. They found depression and anxiety scores at the beginning of the school year predicted worse end of year GPA, and end of year GPA negatively predicted anxiety and depression scores at the

beginning of the following school year. These results suggest a negative reciprocal relationship where lower grades are reciprocally related to higher internalizing problems over time, providing support for a maladaptive feedback process within a resilience framework.

However, recent research may indicate a more complex bidirectional relationship between depression and school performance. The study by Weeks et al. (2016) discussed above showed a reciprocal relationship with a different direction of influence depending on which construct preceded the other in time. In a community sample of 6,425 Canadian children, 4 to 5 years old, they found that greater internalizing predicted greater future academic performance. However, with predictor and outcome switched, lower academic competence predicted greater future internalizing. These findings do not suggest a simple feedback resilience process, rather a complex relationship where greater internalizing predicts greater school success, but lower school success predicts greater internalizing. However, these complex results may be due in part to lengthy measurement waves. Measurements in this study were taken every 2 years (for 7 waves), which may be too large of a time frame between waves to accurately capture changes associated with school functioning and internalizing during development. Throughout the school year children may experience varying levels of stress and internalizing symptoms related to testing, exams, and other scheduled work. A two-year gap in evaluations does not capture fluctuations throughout the school year. Shorter evaluation timeframes, with at least one assessment per year, may be preferable in capturing the changes over time in these constructs. Further, Weeks et al. (2016) did not distinguish between depression and anxiety as the other studies discussed above. Depression measures were only taken in the

final wave. It is possible that anxiety is driving one relationship (i.e. anxiety in children predicts greater school performance) while the other relationship is driven by depression (i.e. poor school performance leads to future depressive symptoms). The studies by Verboom et al. (2014) and Weidman et al. (2015) that show greater depression is reciprocally related to lower school performance over time (in both directions) may be more accurate.

For at-risk populations, school performance may be an important part of the resilience process, and therefore more significant in vulnerable populations than in the community samples discussed above. In a review, Gilligan (2007) suggests that doing well in school may contribute to resilience and recovery in vulnerable people who face adversity. Being placed in out-of-home care may exacerbate the adversity that maltreated children face, making school performance particularly important for these children. For children who have been removed from their home environment and their families, school may provide a stable connection to normalcy that is important for these children to recover from the adversity they face in other areas of their lives. Although no studies to date have examined the reciprocal relationship between school functioning and depression in out-of-home samples, preliminary evidence of this reciprocal relationship can be seen in cross-sectional and longitudinal studies. Stoner et al. (2015) found improvements in school functioning on the CANS to be the fourth and final significant predictor of improvement in depression symptoms in a sample of 228 children and adolescents (4 to 20 years old) in foster care in the United States. This longitudinal study provides preliminary support that school functioning predicts future depression. For evidence that depression may predict school functioning, only cross-sectional research has been conducted to date. In a sample of

231 adolescent girls (12 to 19 years old) involved in the child welfare system in the United States, Threlfall et al. (2017) examined factors related to self-reported school functioning (both behavioral and academic problems). They found that greater self-reported depression was related to greater problems in school functioning. Further, this relationship was fully mediated by school engagement, suggesting depression leads to school disengagement, which leads to poorer school functioning. However, because this study was cross-sectional, it is not known whether this pattern would be observed across time. Taken together, the results from Stoner et al. (2015) and Threlfall et al. (2017) suggest there may be a reciprocal relationship between school functioning and depression for children in out-of-home care similar to what is seen in community samples.

Internal Factors

The internal risk and protective factors identified in Study 1, represented in Figure 4, include optimism, co-occurring anxiety/depression, traumatic stress, and externalizing problems. Co-occurring anxiety/depression, traumatic stress, and externalizing problems were common risk factors in both the anxiety and depression models, while optimism only predicted changes in depression odds.

Optimism. Studies show that a lack of optimism is related to depression and internalizing problems in both community (Dooley et al., 2015; Keyfitz et al., 2013; Smokowski et al., 2014) and out-of-home care samples (Bell et al., 2013). Results from Study 1 support findings that optimism predicts changes in depression odds for children in out-of-home care, but not changes in anxiety. Recent research suggests that a lack of optimism is related uniquely to depression in child samples. In a Canadian school based sample of 686 adolescents (10 to 14 years old), Weeks, Coplan, and Ooi (2017) found that

children with depression had higher self-reported cognitive triad scores (a measure that includes a negative view of the future) compared to children in the anxiety or control groups. Their findings suggest that cognitive biases, defined as a negative view of the self, world, and future, are unique to depression over other internalizing problems. Our findings from Study 1 support this conclusion, as optimism was only a significant predictor in the depression model.

Fostering optimism has been included as a component in resilience interventions for children and adolescents. The Penn Resiliency Program is a cognitive-behavioural program designed to treat and prevent internalizing problems, and to foster resilience in children more generally (Reivich, Gillham, Chaplin, & Seligman, 2013). One of the seven key interpersonal abilities targeted by the program is to increase realistic optimism in adolescents. Pilot testing of this program has shown some success in preventing future depression for those with initially elevated depression scores (effects found two years post-intervention). However, findings from other studies have been mixed. In a sample of 11 to 13 year old Australian children, the program significantly reduced anxiety symptoms but not depression, compared to the regular school health curriculum (Reivich et al., 2013). It is possible that the lack of change in depression is evidence that reduced optimism occurs more readily after depression has developed instead of acting as a predisposing cognitive style.

There has been little research investigating the reciprocal relationship between optimism and depression over time. Research concerning explanatory style in community samples may provide preliminary evidence of a reciprocal relationship between optimism and depression. In a community sample of 508 third grade children in the United States,

Nolen-Hoeksema, Girgus, and Seligman (1992) examined several correlates to depression over 5 years. They found depression tended to decrease across the five-year study, while explanatory style (i.e. pessimism vs. optimism) remained fairly stable across time. In a regression analysis, they found earlier pessimistic explanatory style predicted subsequent depression scores, but only across the last 4 waves (2 years). They also found depression predicted later pessimistic explanatory style across all but one of the waves (wave 6 of 9). These findings suggest a reciprocal relationship between optimism and depression, where the path between depression and future pessimism may be stronger.

Children in out-of-home care may have less certainty regarding their future than other children in terms of where they will be living, attending school, and for how long. Therefore, they may be at particular risk for a lack of optimism. Kaiser and Malik (2015) found that emotional maltreatment (the isolating and terrorizing subscales of the maltreatment measure) predicted 21% of the variance in depression scores in a community sample of 400 Pakistani adolescents, 14 to 18 years old. The addition of optimism/pessimism as a moderator in the model showed optimism moderated this relationship, where greater optimism was associated with less depression across all levels of emotional maltreatment. These findings suggest that optimism may serve as a protective effect against the effects of maltreatment on depressive symptoms.

There is also some preliminary evidence of a reciprocal relationship between optimism and depression in children in out-of-home care. In a sample of 381 adolescent females (11 to 16 years old) involved with the child welfare system in the United States, Lalayants and Prince (2015) examined the bidirectional relationships between (1) self-reported loneliness and (2) depression, optimism, and school disengagement. In examining

the reciprocal relationships across two waves, approximately one year apart, they found a reciprocal relationship over time between loneliness and depression. They also found loneliness predicted future school disengagement and vice versa. And lastly, loneliness predicted later low future expectations (low optimism) and low future expectations predicted later depression scores. These results suggest an indirect bidirectional relationship between optimism and depression through loneliness. Further research is warranted in order to assess a possible direct reciprocal relationship between optimism and depression for children in out-of-home care.

Co-occurring anxiety and depression. There is sufficient evidence of the comorbidity between depression and anxiety problems in developmental samples both in the general community (Axelson & Birmaher, 2001) and in out-of-home care (Leenarts et al., 2013; Meltzer et al., 2002). Results from Study 1 indicated depression and anxiety were both the strongest predictors of the other in each respective model. However, the reciprocal relationship between anxiety and depression over time is less well understood.

In a review of epidemiological research, age of onset studies show depression typically follows anxiety (Beesdo et al., 2009). Early research has suggested that childhood anxiety leads to depression in adolescence. In a community sample of 330 grade 3 and 6 students in the United States, Cole et al. (1998) investigated child- and parent-reported anxiety and depression across three years. Data was collected every 6 months for 6 waves. Using separate cross-lagged models for parent- and child-reported symptoms, they found child-reported anxiety predicted child-reported depression six months later, but not the other way around. Similarly, parent-reported anxiety predicted parent-reported depression six months later. However, unlike the child model, the parent model showed

parent-reported depression negatively predicted later anxiety (i.e. higher depression scores predicted lower subsequent anxiety, according to parents). These findings suggest the development of anxiety precedes the development of depression. The authors further suggest the findings from the parent model indicate that depression essentially replaces anxiety in adolescence. However, this theory would not explain the high comorbidity rates also seen in adult populations (Murphy et al., 2004). These researchers were working from a temporal sequence hypothesis, where the development of depression follows the development of anxiety in childhood and adolescence.

Recently, several theories have been proposed to explain the development of anxiety and depression during childhood and adolescence. Three main pathways have been proposed to explain the link between depression and anxiety (Schleider, Krause, & Gillham, 2014). In the first pathway, the single diagnosis model, some researchers have questioned the usefulness of distinguishing anxiety from depression, mainly regarding the overlap in measurement. They suggest that, particularly in young children, a “negative affectivity” term might be more accurate than trying to distinguish between anxiety and depression. However, it is more plausible that this is a discriminant validity issue in the literature rather than a diagnostic one. The second pathway, the correlated liabilities model, suggests there may be common risk factors (such as parent depression, neurological/physiological factors, rumination, emotional regulation/coping, gender) that predispose children to both disorders. A third theoretical explanation for the anxiety-depression link is the causal model. It has been suggested that childhood anxiety leads children to think and behave in ways that lead to the onset of depression in adolescence. For example, the rumination and

worry that is commonly associated with anxiety may mediate a shift from anxiety to depression later in childhood/adolescence.

Cohen, Young, Gibb, Hankin, and Abela (2014) attempted to compare the correlated liabilities and causal models in a community sample of 678 children in grades 3, 6 and 9 from the United States. They also proposed a fourth model, the diathesis-anxiety model, which combines the causal and correlated liabilities models described above. In this model anxiety symptoms interact with specific vulnerabilities to predict later depression. Children were assessed every 3 months, for 18 months (7 waves) on self-reported depression, anxiety, rumination, self-criticism, and negative life events. Using structural equation modeling, their findings did not support a causal model, anxiety did not predict future depression, and depression only predicted future anxiety when also controlling for future depression (small effect size, $r = 0.08$). In order to test the correlated liabilities model, they examined the interactions between cognitive vulnerabilities (rumination and self-criticism) and stressors (negative events) on anxiety and depression in separate models. Findings did not support a correlated liability model; no interactions significantly predict either anxiety or depression. To test the diathesis-anxiety model they tested whether self-criticism and rumination interacted with anxiety to predict later depression, as well as the reverse model where the interaction between cognitive vulnerabilities and depression predicted future anxiety. The model in which cognitive vulnerabilities interact with anxiety to predict future depression was significant (small effect sizes, $r = 0.05 - 0.07$), the alternate model was not statistically significant. No age or gender effects were observed in any of the models. Findings from this study suggest support for the proposed diathesis-anxiety model; however, results also indicated depression predicts future anxiety when the

alternate causal model was tested. Although these models have not been tested in out-of-home samples, the results above suggest there may be a reciprocal relationship between anxiety and depression during childhood and adolescence.

From a resilience perspective, initial adaptation or maladaptation to anxiety may predispose children to future maladaptation in other areas, including depression. The feedback process of resilience discussed above would then contribute to future adaptation or maladaptation in both anxiety and depression over time. For children in out-of-home care, who have likely experienced many stressful events that could contribute to the initial onset of anxiety, this feedback resilience process may be particularly important to understand. Results from Study 1 suggest a possible bidirectional relationship between anxiety and depression for children in out-of-home care, supporting a resilience process at work.

Traumatic stress. The relationship between anxiety, depression, and traumatic stress has not been widely studied. However, since PTSD is a specific form of anxiety, the mechanisms described above regarding the link between depression and anxiety might be similar for PTSD and depression and PTSD and other types of anxiety. Research shows high comorbidity rates between PTSD, depression, and anxiety in out-of-home developmental samples (Leenarts et al., 2013; Rosenberg et al., 2014). These children have likely experienced greater incidents of trauma and maltreatment, which could lead to greater incidents of all three emotional problems.

Although some research has examined the relationship between anxiety and depression over time, few studies have examined the bidirectional relationships between PTSD and anxiety or depression. In a sample of 73 children (8 to 18 years old) seeking

treatment for PTSD in Israel, Aderka et al. (2011) examined the longitudinal reciprocal relationship between depression and PTSD. Children participated in a 12 to 15 session prolonged exposure therapy program. This program was a form of trauma focused cognitive behavioural therapy, rooted in emotional processing theory. Before each session children completed the Child PTSD Symptom Scale and the Beck Depression Inventory or Children's Depression Inventory (depending on age). In a mediational Hierarchical Linear Model with lagged mediator (PTSD) and predictor (time), they found reduced PTSD predicted reduced depression at the following session. PTSD accounted for 64.5% of the variation in future depression, and fully mediated the effect of time on depression. They also found that reduced depression predicted reduced PTSD at the following session. However, depression only accounted for 11.0% of the variation in later PTSD, and the path between time and PTSD was still significant after accounting for earlier depression. These results suggest a reciprocal relationship between PTSD and depression, where the path from PTSD to later depression is stronger than the converse.

To date, there is no research in developmental samples examining the reciprocal relationship between PTSD and other anxiety disorders; however, research in adult samples has examined the association between anxiety sensitivity (a fear of anxiety symptoms) and PTSD to reveal a reciprocal relationship across time (Marshall, Miles, & Stewart, 2010). Although Marshall et al. (2010) did not examine anxiety disorders directly, anxiety sensitivity is highly related to various anxiety disorders in child samples. Muris, Schmidt, Merckelbach, and Schouten (2001) examined the correlations between self-reported anxiety sensitivity, trait anxiety, anxiety disorders, and depression in a community sample of 819 Dutch adolescents (13 to 16 years old). They found that anxiety

sensitivity was moderately to highly correlated to self-reported symptoms of generalized anxiety disorder ($r = .70$), separation anxiety disorder ($r = .57$), social phobia ($r = .62$), panic/agoraphobia ($r = .71$), obsessive-compulsive disorder ($r = .61$), physical injury fears ($r = .44$), and total anxiety ($r = .79$). This study provides evidence that anxiety sensitivity is related to various anxiety disorder symptoms in children, therefore, considering the results from Marshall et al. (2010), we might expect a similar reciprocal relationship between anxiety and PTSD in child welfare samples.

Externalizing problems. Externalizing and internalizing problems are often comorbid in children in out-of-home care (McMillen et al., 2005; McWey, Cui, et al., 2010; Williams & Harper, 1979). Further, externalizing problems have been shown to affect trajectory class membership for depression symptom trajectories (Munson & McMillen, 2010) and age of onset for anxiety disorders (Roza et al., 2003). Results from Study 1 show externalizing problems affect the odds of more serious anxiety and depression ratings for children in out-of-home care.

The presentation and/or detection of internalizing and externalizing disorders may be unique in out-of-home populations. Recent research has suggested that internalizing and externalizing problems are two individual factors, rather than previous theories which proposed they were opposite poles of a continuum. This theory better explains the comorbidity seen among these psychiatric disorders (Cosgrove et al., 2011). Despite high comorbidity rates for children in out-of-home care, the detection and/or presentation of internalizing and externalizing problems does not occur simultaneously. In a sample of 373 17-year-old adolescents in out-of-home care within the United States child welfare system, McMillen et al. (2005) found that the majority of internalizing disorders appeared after

entrance into foster care while the majority of externalizing disorders appeared before entrance to foster care. Using the Diagnostic Interview Schedule for DSM-IV, they found that 57% to 75% of externalizing problems had an age-of-onset prior to entry into care, compared to only 33% to 42% of internalizing problems. However, researchers only collected data at a single time point in this study, and therefore no conclusions can be drawn regarding whether this phenomenon is due to respondent recall bias or whether the internalizing problems actually develop after externalizing problems. Age-of-onset research from the community suggests the age-of-onset for behaviour problems and anxiety are similar (approx. age 11) while mood disorders tend to develop later (Ronald C. Kessler et al., 2005). Examining the reciprocal nature between externalizing and internalizing problems may assist in understanding the observed co-occurrence and potential resilience/maladaptation feedback cycle for children in out-of-home care.

Several theories have been proposed to explain the comorbidity between internalizing and externalizing problems (Morin et al., 2017). First, the failure hypothesis suggests the presence of externalizing problems impede development in social and academic areas, and “failures” in these areas leads to the development of internalizing problems. A second theory, the acting out hypothesis, suggests that youth with internalizing problems mask these feelings by acting out, engaging in externalizing behaviours. These unidirectional theories have been updated to more current bidirectional ones. A third theory, the adjustment erosion hypothesis, suggests that both internalizing and externalizing behaviours lead to social and academic failures, which are then mutually reinforced through these failures and may lead to other problems as well. This theory is most similar to the feedback resilience process from our model. Morin et al. (2017) also

propose a fourth theory: the socio-developmental milestones perspective. This theory suggests externalizing behaviours only lead to internalizing problems once youth have reached the developmental milestone of certain cognitive abilities (self evaluation, empathy) that are necessary to recognize the negative impact that externalizing behaviours have on their lives. Similarly, internalizing problems only lead to externalizing behaviours once youth develop intimate peer relationships where they can then experience rejection and victimization that can lead to externalizing problems. This theory suggests that the development of these cognitive and social aspects occur in adolescence and therefore the reciprocal relationship between internalizing and externalizing should become stronger as children get older.

Morin et al. (2017) tested these theories in a sample of 138 Australian adolescents with low cognitive abilities and 556 adolescents with average to high cognitive abilities. Children were recruited in grade 7 (12 to 14 years old) and followed annually for 3 years. Teachers rated internalizing (anxiety and depression) and externalizing behaviours (direct and indirect aggression, hyperactivity, and inattention) at the end of each school year. They found symptoms of externalizing and internalizing were both relatively stable over time. They observed a bidirectional relationship between internalizing and externalizing, with a slightly stronger relationship between internalizing predicting later externalizing ($B = -.138$ to $-.154$) than for externalizing predicting later internalizing ($B = -.099$ to $-.133$). Results were similar for both cognitive groups, indicating stronger support for the adjustment erosion hypothesis over the socio-developmental milestones perspective, or either of the unidirectional theories. Similarly, Weeks et al. (2016), discussed above, found greater internalizing predicted greater future externalizing (and vice versa) in a Canadian

community sample of 6,425 children 4 to 5 years old, across 12 years. These findings provide further support for the adjustment erosion hypothesis in children over time. These studies both examined internalizing problems as a single measure. However, since age-of-onset research shows anxiety and depression typically develop at different times during childhood, it is important to examine these symptoms separately in relation to externalizing problems for a better understanding of the reciprocal nature between constructs.

There is limited research examining these models using anxiety and depression alone. Blain-Arcaro and Vaillancourt (2017) examined the failure, acting out, and adjustment erosion (reciprocal) models between aggression and depression in 643 grade 5 students (age 10) followed annually for 7 years (to age 16). In all three models, the only significant path was between relational aggression predicting later depression. The reciprocal path was not significant, and there was no relationship between physical aggression and depression. These findings suggest support for the failure model. When considering age-of-onset research, it is reasonable to expect support for the failure model, since depression appears later in adolescence/adulthood than externalizing behaviour or anxiety. Although no studies have examined anxiety symptoms alone in a reciprocal model with externalizing scores, age-of-onset research would suggest the adjustment erosion (reciprocal) model would fit best. These relationships have not been examined in out-of-home samples; however, we might expect reciprocal relationships between anxiety, depression, and externalizing problems similar to the majority of the community sample studies discussed above.

From the studies reviewed above, there is evidence that several factors from Study 1 might display reciprocal relationships with outcomes of interest (i.e. family functioning, school functioning, co-occurring anxiety/depression, traumatic stress, and externalizing behaviour), while other factors appear to have only unidirectional relationships with internalizing outcomes (i.e. community involvement, placement type, and optimism). However, the feedback/reintegration process described by Kumpfer (1999) would suggest that all factors should display reciprocal relationships with anxiety and depression over time. Adaptation or maladaptation in one area, should predict future adaptation/maladaptation in other areas, and vice versa. Considering the marginal empirical support for these relationships from previous research, the current study is relatively exploratory in nature.

Demographics

Several demographic variables should be taken into account when examining internalizing problems in children. As seen in Figure 4, age and gender predicted changes in depression rating severity, and racial differences predicted changes in anxiety rating severity. In addition, several studies discussed above found gender and age differences.

Gender. Several studies above found gender differences in the reciprocal relationships between internalizing problems and related factors. Weeks et al. (2016) found that the path between externalizing and future depression was stronger in girls, while the path from internalizing to future externalizing was stronger in boys. Aarons et al. (2010) also observed gender differences in the reciprocal paths between internalizing problems and placement changes, where internalizing predicted later placement changes in boys, while placement changes predicted later internalizing problems in girls. This latter

path (internalizing to later placement changes) was not observed with gender groups combined, suggesting unique pathways between internalizing and placement changes for boys and girls.

Other studies did not show gender differences in the reciprocal relationships over time; however, they did observe other gender differences in study variables. In their study examining the effect of after school community activities on depression, Sweden, Mahoney and Schweder (2002) found that boys perceived greater support from activity leaders than girls overall. And Muris et al. (2001) found that girls scored higher than boys on all self-reported study measures (anxiety sensitivity, trait anxiety, anxiety disorders, and depression). Finally, Blain-Arcaro and Vaillancourt (2017) found girls had higher mean depression scores and boys had higher mean physical aggression scores. These findings provide support for including gender in all analyses in order to control for the potential differences that have been observed in other studies.

Age. There is also some evidence for differences across age in the reciprocal relationships reviewed above. Along with gender differences, Aarons et al. (2010) observed age differences in the reciprocal paths between internalizing problems and placement changes. They found that the path between internalizing predicting future placement changes was significant for the middle child group (ages 6 to 10), while externalizing predicting later placement changes was significant in both the middle and older (11 years +) age groups. Placement changes predicting later externalizing problems was only significant in the middle age group. And there were no significant paths in the 5 and under group. Other non-reciprocal analyses examining anxiety and depression outcomes in child welfare samples have also found age effects (McWey, Cui, et al., 2010; Stoner et al., 2015;

Tonmyr et al., 2011). In Study 1, increased age significantly predicted increased odds of severe depression ratings in the final model for children in out-of-home care. There was also a significant quadratic component to depression scores across age in the final model. And in the initial model for anxiety there was a significant quadratic component to age. Therefore, age should be included in the current study to control for possible effects.

Race. Although none of the above studies found effects for race, many studies controlled for race in their models. Other studies in child welfare populations have shown racial differences when examining anxiety and depression outcomes (Orton, 2008; Tonmyr et al., 2011). And in Study 1, we found racial differences in the anxiety model, where Caucasian children had an increased probability of severe depression compared to African-American children. As such, race should be included as a covariate in all analyses.

Time in care. In addition to the above-mentioned demographic variables, time in out-of-home care was a significant predictor for depression odds in Study 1. Other studies have also shown depression scores to change across time in care (Munson & McMillen, 2010; Orton, 2008). Although not a significant predictor in our anxiety results from Study 1, other research has also shown anxiety to change across time in out of home care (Augenbraun, 2004; Lyons et al., 2001). Therefore, the current study should also control for time in out-of-home care in all models.

Methods

Study 2 used the same archival data as Study 1, collected across several years from the Maryland Department of Human Services.

Measures

Child and Adolescent Needs and Strengths (CANS; Lyons, 2009a). For a more thorough description of the CANS, see Study 1. The version of the CANS used by the Maryland Department of Human Services is comprised of 94 items to assess children on several domains: trauma experiences, trauma stress, functioning, strengths, acculturation, behavioural/emotional needs, risk behaviours, and caregiver needs and strengths. A copy of the full Maryland CANS can be found in Appendix A. Recall, items are scored on a four-point scale which are meant to inform client's care using "actionable" levels as follows:

- 0 No evidence, no need for action
- 1 Watching/waiting/prevention
- 2 Action is needed
- 3 Immediate or intensive action needed

Strength items are rated on a similar scale as needs items as follows:

- 0 Centerpiece strength
- 1 Useful strength
- 2 Identified strength
- 3 No strengths identified

Reliability/validity. The CANS requires formal certification and has shown inter-rater reliability through case-reviews around 0.85 and prospective inter-rater reliability around 0.90 (Lyons, 2004). Individual CANS items have shown reliabilities between .55

and .98. Specific to our study, a mental health version of the CANS with a combined depression/anxiety item showed the intraclass correlation ranged from .65 to .75, indicating moderate to good inter-rater reliability for this item (R. L. Anderson et al., 2003).

The CANS construct validity is shown through correlation with other well-known measures of functioning (i.e. the Child and Adolescent Functional Assessment Survey [CAFAS]; $r = .63, p < .001$). Further, CANS domains have shown correlations between .54 and .73 with corresponding CAFAS subscales (Lyons et al., 2004). To date, no peer-reviewed studies examine the construct validity of individual CANS items. For a detailed discussion on using individual CANS items, see study 1. Face validity can be assumed from its widespread use and acceptance in diverse child serving systems, such as child welfare, mental health services, and juvenile justice systems (Lyons, 2009a). The CANS has also shown effectiveness as a decision support tool (Chor et al., 2012). Studies in several areas have successfully used single items from the CANS as both predictor (Cordell et al., 2016; Dunleavy & Leon, 2011; Epstein et al., 2011), and outcome variables (Dunleavy & Leon, 2011).

Scoring. Information from the CANS can be used at the single item level, as mentioned in Study 1, single item reliabilities range from moderate to excellent. Alternatively, items can be averaged and multiplied by 10 to create dimensions with a 30 point scale where 0 represents a child with 0 ratings on all dimension items and 30 reflects a child with all 3's on those items (Lyons, 2009a). However, in our study, composite scores were not multiplied by ten. Since we used single items as predictors and outcomes alongside composite scores, taking the average of composite items would keep them on the same 0 to 3 scale as other predictors and the outcome variables. Cronbach's alphas were

calculated for composite scores to evaluate the internal consistency of each factor. The standardization of composite scores was investigated and correlated perfectly to unstandardized scores; therefore the unstandardized composites were used. Single item outcomes in this study are treated as ordinal (i.e. anxiety, depression, optimism, community involvement), while composite outcomes are treated as continuous (i.e. family functioning, school functioning, traumatic stress, externalizing) and categorical outcomes (i.e. placement type) were treated as dichotomous.

The CANS items and composite scores that were used in the current study as both predictors and outcomes in our reciprocal models are as follows:

Depression. Depression symptoms are represented by the CANS child behavioural/emotional needs domain item “depression/mood disorder.” This item refers to symptoms of DSM-IV depressive disorders such as major depression, dysthymia, bipolar disorder, and mood disorder not otherwise specified.

Anxiety. Anxiety symptoms are characterized by the CANS child behavioural/emotional needs domain item “anxiety.” This item captures the child’s level of fearfulness, worrying, and other characteristics of anxiety. This includes symptoms of phobia and other DSM-IV anxiety disorders and the amount of interference this causes in daily functioning.

Family functioning. Family functioning is operationalized using two items from the CANS. The item “family” from the child strengths domain refers to the quality of the relationship the child has with members of the family (i.e. strong, loving, supportive relationship with at least one family member). The second item is “family” from the life functioning domain. This item refers to how well the child gets along with family. These

two items were averaged for a family functioning composite score with a range from 0 to 3. The Cronbach's alpha for this composite is .553. This may indicate poor relatedness between items. However, the low Cronbach's alpha may also be a reflection of the small number of items included (Tavakol & Dennick, 2011).

Community. The concept of community involvement is defined using a single item, "community life" from the CANS child strengths domain. This item refers to the degree to which the child is involved in the community in which they live (e.g. member of a community group like the Scouts, knows neighbours well).

School functioning. The school functioning factor consists of one CANS item from the child strengths domain, "educational setting", and three CANS items from the life functioning domain: school behaviour, school achievement, and school attendance. These four items are averaged for a composite score that ranges from 0 to 3. The Cronbach's alpha for this factor is .761, which meets the minimum standard generally accepted for a scales internal consistency.

Traumatic stress. The emotional factor traumatic stress is comprised of seven CANS items which make up the CANS domain "symptoms resulting from exposure to trauma" and include: adjustment to trauma, traumatic grief/separation, re-experiencing, avoidance, numbing, dissociation, and affective and/or physiological dysregulation. The majority of these items are analogous with DSM-IV symptoms of PTSD. Items are averaged into a composite score, which ranges from 0 to 3. The Cronbach's alpha for this factor is .885, indicating acceptable internal consistency.

Optimism. The CANS child strength item "optimism" reflects the child's sense of him/her self in the future and positive future orientation (e.g. having an optimistic outlook,

positive about future, or difficulty seeing anything positive in ones life or about ones self; pessimistic).

Externalizing. The externalizing factor is composed of three CANS items from the child behavioural/emotional needs domain: attention deficit/impulse control, oppositional behaviour, and conduct/antisocial behaviour. These three items are averaged for a composite score, with a range of 0 to 3. The Cronbach's alpha for this factor is .801, indicating acceptable internal consistency.

CANS initial assessments are completed within 60 days for all children 5 years and older entering out-of-home placements with the Maryland Department of Human Services. Assessments are also completed whenever children are assessed for a higher level of care (e.g. going from regular foster care to intermediate care, treatment foster care, group care, or residential treatment), assessed for a step down in care, have a change in permanency plan, prior to signing adoption or guardianship agreements, and every 180 days as part of the case reconsideration process (regardless of placement to inform case planning and service delivery).

Demographic information. Demographic information and information on child placements were also obtained from the Maryland Department of Human Services.

The demographic information used in the current study includes: placement type, gender, age, and race/ethnicity.

Placement type. Placement type categories used by the Maryland Department of Human Services included 33 different categories. These categories were collapsed into seven main placement types: kinship care/trial visit home, foster care (including restricted), treatment foster care, group home/residential, residential treatment,

institution, and other (including independent living, emergency group/foster care, unknown whereabouts, etc.). Unlike in Study 1, placement type categories were dummy coded into seven variables in order for them to be used separately as both predictors and outcomes in reciprocal analyses. In this case, the reference for each category is in comparison to all other placements.

Gender. The Maryland Department of Human Services records gender as either “male or female.” Gender was coded as 0 = female and 1 = male for analysis.

Age. Date of birth and date at the time of each CANS assessment was provided by the Maryland Department of Human Services. Exact age at the time of each assessment is calculated from the difference between each child’s birth date and date of each assessment. Age is measured in years.

Race. Information on child’s primary race is recorded by the Maryland Department of Human Services using the following categories: African American, Caucasian, American Indian, Asian, Native Hawaiian/Pacific Islander, or unable to determine. The latter four categories displayed low frequencies compared to the first two; therefore they were combined into a single category “other/unknown.” The ethnicity classification of Hispanic origin is recorded in a separate variable by the Maryland Department of Human Services. The classification described above regarding race and ethnic origin follows the United States Census Bureau’s structure (United States Census Bureau, 2017). Race was dummy coded into two variables, with African American as the reference category. Hispanic origin was dummy coded into two variables (i.e. Hispanic and Unknown), with non-Hispanic origin as the reference category for analysis.

Time in out-of-home care. Time in care at the time of each assessment was calculated as the difference between exact age at each assessment (calculation described above) and age at entry to care (provided by Maryland Department of Human Services). Time in out-of-home care is represented in months.

Time between assessments. Time between assessments for each assessment was calculated as the difference between the current assessment date and the lagged ($t - 1$) assessment date. Lagged time between assessments is represented in months.

Participants

The same data from Study 1 was used for all analyses in Study 2. For a detailed description, see Study 1. The data for this study was collected from children and adolescents who entered out-of-home care in the state of Maryland, USA between May 2010 and April 2017. The full dataset includes information on 1,765 children and adolescents who entered out-of-home care between the ages of 5 and 14 years old.

The number of CANS assessments for each child ranged from 3 to 18, with a mean of 4.5 assessments ($SD = 1.8$). Data from children with only 1 or 2 assessment points were not requested from Maryland Department of Human Services as described in Study 1.

Analysis of Data

Kumpfer notes that one difficulty in studying resilience is finding methods to separate cause and effect and investigate bidirectional relationships amongst large numbers of variables (Kumpfer, 1999). In study 1, it was assumed that the time-varying predictors are affecting anxiety and depression outcomes and not the other way around. However, as seen in our literature review, many correlates of anxiety and depression

display both predictive and dependent qualities depending on the way in which researchers investigate these concepts.

Study 2 focuses on gaining a better understanding of the directional relationships between the time-variant environmental and internal factors and internalizing outcomes in order to better understand the feedback resilience process described by Kumpfer (1999), within an out-of-home care developmental context. We aim to identify which significant predictors from Study 1 display a reciprocal relationship with anxiety or depression over time.

Research question. Is there a reciprocal relationship between environmental and internal risk and protective factors and internalizing problems?

Hypothesis. Family functioning, community involvement, placement type, school functioning, co-occurring anxiety/depression, traumatic stress, optimism, and externalizing problems will display reciprocal relationships over time with internalizing problems.

Analysis. Recently, various techniques have been developed in order to study reciprocal relationships in longitudinal data. Cross-lagged panel analyses are often used for this type of analysis. These models are a special case of structural equation modeling for longitudinal data. These models use the previous time point for X to predict Y while taking into account the previous value for Y. By including the previous value for Y, the model takes into account the stability of Y over time (the autoregressive effect). This allows for the measurement of the unique effect of previous X on Y (cross-lagged effect) by controlling for the possible initial correlation of X and Y (Selig & Little, 2012). However, one limitation of structural equation models is that they focus on inter-individual variability rather than intra-individual variability. Additionally, although some work has been done using time as

a continuous measure in these models (Voelkle, Oud, Davidov, & Schmidt, 2012), they do not take into account individual differences in time between assessments, but rather treat uneven time points of assessments similarly across all participants.

Limited research has been done using HLM for cross-lagged designs (Duckworth, Tsukayama, & May, 2010; Shochet et al., 2006). However, HLM provides greater flexibility in uneven assessment points between and within participants. HLM also provides parameter estimates both within and between participants allowing researchers to focus on individual differences or group effects as desired. Since the focus of the current study is on the reciprocal relationships of study variables within children over time and CANS assessments are taken at varying times throughout a child's time in out-of-home care, HLM analysis is a better fit for our data.

This type of analysis requires two separate models for each reciprocal relationship of interest. The first model can be described using the simplified level-1 formula:

$$Y_t = \pi_{0i} + \pi_{1i} * Y_{(t-1)i} + \pi_{2i} * X_{(t-1)i} + D_{mti} \delta_{mi}$$

with the reciprocal level-1 formula:

$$X_t = \pi_{0i} + \pi_{1i} * X_{(t-1)i} + \pi_{2i} * Y_{(t-1)i} + D_{mti} \delta_{mi}$$

where X and Y are the two constructs of interest, for example depression and optimism, and π_{1i} represents the autoregressive effect of each outcome at time t-1 onto itself at time t. The cross-lagged effects of X and Y at time t-1 are represented by π_{2i} in each model (adapted from Selig & Little, 2012 for HLM).

In the current study, we controlled for the effects of age, age², time in care, time between assessments, gender, race/ethnicity, and lagged outcome. Age, age², time in care, gender, and race/ethnicity were shown to be significant predictors of either depression or

anxiety in Study 1; therefore, we controlled for these effects in all Study 2 models. However, in cases where the quadratic component for age (i.e. age²) was non-significant it was removed for greater model parsimony. Other non-significant controls were retained in order for models to be as similar/comparable as possible. In order to control for differences between and within children on the frequency with which assessments were done, time between assessments was included at level-1 in all models. Finally, as described above, the lagged outcome was included in all models to control for the autoregressive effect of earlier levels of the outcome variable on current levels, as well as the earlier correlation at time t-1 between outcome and predictor.

The study variables used in our reciprocal analyses include continuous, ordinal, and categorical data. As such, three different types of HLM models were used based on the outcome in question.

Continuous outcomes. Our continuous outcomes included the reciprocal models for traumatic stress, externalizing, family functioning, and school functioning. For these outcomes, two level linear growth models were used. The standard level-1 formula for all continuous outcomes is:

$$\begin{aligned} \text{OUTCOME}_{ti} = & \pi_{0i} + \pi_{1i} * (\text{TIME IN CARE})_{ti} + \pi_{2i} * (\text{TIME INTERVAL})_{ti} \\ & + \pi_{3i} * (\text{AGE})_{ti} + \pi_{4i} * (\text{AGE}^2)_{ti} + \pi_{5i} * (\text{LAG OUTCOME})_{ti} \\ & + \pi_{6i} * (\text{LAG PREDICTOR})_{ti} + e_{ti} \end{aligned}$$

with level-2 formulas:

$$\begin{aligned} \pi_{0i} = & \beta_{00} + \beta_{01} * (\text{gender}) + \beta_{02} * (\text{race: white}) + \beta_{03} * (\text{race: other}) \\ & + \beta_{04} * (\text{Hispanic: yes}) + \beta_{05} * (\text{Hispanic: unknown}) + r_{0i} \end{aligned}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + r_{2i}$$

$$\pi_{3i} = \beta_{30} + r_{3i}$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

$$\pi_{5i} = \beta_{50} + r_{5i}$$

$$\pi_{6i} = \beta_{60} + r_{6i}$$

where π_{0i} represents the intercept and π_{1i} to π_{6i} represent the slopes of all control and predictor variables in the model. The error is denoted by e_{ti} and represents the error for person (i) at assessment time (t). At level-2, β_{10} through β_{60} represent the average linear slopes between people across each respective control/predictor. Finally, r_{0i} through r_{6i} represent the associated variances between children for each respective variable.

Ordinal outcomes. Our ordinal outcomes of interest included anxiety, depression, and the reciprocal outcomes of optimism and community involvement. For these outcomes, cumulative probability models were used, similar to those outlined in Study 1. As in Study 1, the cumulative probability equations for $M = 4$ rating values are:

$$P[R_{ti} \leq 0 | \pi_i] = \varphi^*_{0ti} = \varphi_{0ti}$$

$$P[R_{ti} \leq 1 | \pi_i] = \varphi^*_{1ti} = \varphi_{0ti} + \varphi_{1ti}$$

$$P[R_{ti} \leq 2 | \pi_i] = \varphi^*_{2ti} = \varphi_{0ti} + \varphi_{1ti} + \varphi_{2ti}$$

$$P[R_{ti} \leq 3 | \pi_i] = \varphi^*_{3ti} = \varphi_{0ti} + \varphi_{1ti} + \varphi_{2ti} + \varphi_{3ti} = 1$$

where R_{ti} is the rating at each time (t) for each child (i). The level-1 cumulative logit link function for ordinal outcomes is:

$$\eta_{ti} = \log(\varphi^*_{ti} / (1 - \varphi^*_{ti})) = \log(P(R_{ti} \leq m) / P(R_{ti} > m))$$

and the standard level-1 formula for all ordinal outcomes was:

$$\text{OUTCOME}_{mti} = \pi_{0i} + \pi_{1i} * (\text{TIME IN CARE})_{ti} + \pi_{2i} * (\text{TIME INTERVAL})_{ti}$$

$$+ \pi_{3i}*(AGE)_{ti} + \pi_{4i}*(AGE^2)_{ti} + \pi_{5i}*(LAG OUTCOME)_{ti}$$

$$+ \pi_{6i}*(LAG PREDICTOR)_{ti} + D_{mti}\delta_{mi}$$

The level-2 formulas were:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(gender) + \beta_{02}*(race: white) + \beta_{03}*(race: other)$$

$$+ \beta_{04}*(Hispanic: yes) + \beta_{05}*(Hispanic: unknown) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + r_{2i}$$

$$\pi_{3i} = \beta_{30} + r_{3i}$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

$$\pi_{5i} = \beta_{50} + r_{5i}$$

$$\pi_{6i} = \beta_{60} + r_{6i}$$

$$\delta_{mi} = \delta_m$$

The coefficients here can be interpreted in the same way as those from the continuous models with two notable differences. Recall from Study 1 that D_{mti} represents dummy variables indicating whether $m = 2$ or 3 and δ_{mi} is the rating threshold. For a more detailed description of cumulative probability models using HLM see Study 1.

Binary outcomes. Our categorical outcomes included the reciprocal models for our seven binary placement type variables. For binary outcomes we used a Bernoulli model with logit link. The probability of “success” is defined as:

$$P[PLACEMENT_{ti}=1|\pi_i] = \varphi_{ti}$$

where $PLACEMENT_{ti}$ indicates the presence of the placement type in question (i.e. success) at each time (t) for each child (i). The level-1 logit link for binomial models is:

$$\log(\varphi_{ti}/(1 - \varphi_{ti})) = \eta_{ti}$$

where η_{ti} is the log odds of “success” (i.e. placement type present) and φ_{ti} is the probability of success. When the probability of success is 50%, $\eta_{ti} = 1.0$ and the logit is zero, when the probability is less than 50%, η_{ti} is less than 1 and the logit is negative, and when the probability is greater than 50%, η_{ti} is greater than 1 and the logit is positive.

With all controls and predictors included, the standard formula for the level-1 model was:

$$\eta_{ti} = \pi_{0i} + \pi_{1i}*(\text{TIME IN CARE})_{ti} + \pi_{2i}*(\text{TIME INTERVAL})_{ti} + \pi_{3i}*(\text{AGE})_{ti} \\ + \pi_{4i}*(\text{AGE}^2)_{ti} + \pi_{5i}*(\text{LAG OUTCOME})_{ti} + \pi_{6i}*(\text{LAG PREDICTOR})_{ti}$$

And the level-2 formulas are:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(\text{gender}) + \beta_{02}*(\text{race: white}) + \beta_{03}*(\text{race: other}) \\ + \beta_{04}*(\text{Hispanic: yes}) + \beta_{05}*(\text{Hispanic: unknown}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

$$\pi_{2i} = \beta_{20} + r_{2i}$$

$$\pi_{3i} = \beta_{30} + r_{3i}$$

$$\pi_{4i} = \beta_{40} + r_{4i}$$

$$\pi_{5i} = \beta_{50} + r_{5i}$$

$$\pi_{6i} = \beta_{60} + r_{6i}$$

Again, the coefficients here can be interpreted in the same way as those presented in the sections on continuous and ordinal data, with one notable exception. At level-1 there is no error term (e_{ti}), rating level indicator (D_{mti}), or rating threshold (δ_{mi}).

In our seven binomial models, the observed variance was larger than the assumed variance, indicating overdispersion in all models. As such, models were run using the “overdispersion” option in HLM which uses actual rather than assumed variances

(Raudenbush et al., 2013). The average reliability estimates for the Bernoulli models were low (.204 to .601). The interpretation of these estimates are analogous to Cronbach's alphas, suggesting that estimate averages below .7 or .8 provide unreliable level-1 coefficients (Tavakol & Dennick, 2011). Therefore, the results of the placement type models should be interpreted with caution.

In all continuous, ordinal, and binomial models, time in care and the time interval between assessments were added uncentered. Age was grand mean centered prior to calculating age² and importing into HLM. Lagged outcomes and predictor variables were added uncentered for the placement type dummy variables, and group mean centered (i.e. centered around each child's mean) for all ordinal and continuous variables. The variance terms r_{1i} to r_{6i} were fixed as needed in each model based on low reliabilities (below 0.1), high correlations to the intercept (tau above 0.7), and/or non-significant variances. The random effect for age² was non-significant in the models for optimism, community involvement, family functioning, and school functioning and was removed to improve model fit.

Finally, as in Study 1, for ordinal and dichotomous outcomes, the log-odds for significant predictors were converted into probabilities using the formula:

$$\varphi_{ti} = 1/(1+\exp\{-\eta_{ti}\})$$

Missing data. HLM can handle missing data at level-1 but not at level-2. At level-1, missingness ranged from 0.0 to 0.5% for most predictors. Our two primary outcome variables (depression and anxiety) were both 0.5% missing. Placement type was missing for 10.6% of assessments. A missing value analysis showed that missing values on the placement type dummy variables were not related to either depression or anxiety in our

sample. However, missingness on placement type was significantly related to the level-1 control variables time in care ($t(1017.168) = -4.028, p < .001$) and age² ($t(1042.083) = -1.930, p = .054$), and the level-2 control variable gender ($t(1063.542) = -2.662, p = .008$). As discussed in Study 1, rounding is not recommended for imputed discrete data using regression based methods, and other imputation methods require monotonic missing values (Allison, 2005). Therefore, missing values were not imputed in either study. However, analyses including placement type as either a predictor or outcome should be interpreted with caution.

As in Study 1, our level-2 variable gender did not contain missing data and the race and ethnicity variables contained 1.7% and 0.8% missing data respectively. However, since these variables were dummy coded in such a way that missing data were coded into the “other/unknown” variable for race and “unknown” for ethnicity, we were able to retain the full sample.

Software. As in Study 1, all data preparation was done using SPSS for Macintosh version 21.0 (IBM Corp, 2012). Data was then imported into HLM 7.01 for the analysis of all hierarchical models discussed above (Raudenbush et al., 2013).

Ethics Approval

The current study was approved by the University of Ottawa Office of Research Ethics and Integrity, file number H08-16-03. Ethics approval was also granted from the Maryland Human Services Agency, Department of Human Services, RRB 2016-0802. See Appendix B for ethics letters of approval.

Results

Sample Characteristics

The same sample from Study 1 was used in the current study. The final sample included 1,765 children in out-of-home care in Maryland, U.S.A. Descriptive statistics for all level-2 variables are presented in Table 1 and descriptive statistics for all level-1 variables are presented in Table 2. The sample was 51.4% male, and age across all assessments ranged from 5.1 years to 21.1 years with a mean age of 14.4 years ($SD = 3.8$) across all participants. The number of CANS assessments per child ranged from 2 to 18, with a mean of 4.5 ($SD = 1.8$) and 7,979 assessments in total. In addition, the time between assessments ranged from 0.0 to 53.8 months, with a grand mean of 8.5 months ($SD = 4.1$) across all children.

Internal Factors

Co-occurring anxiety/depression. As in Study 1, the unconditional model for anxiety indicated significant variance in anxiety scores between children ($\sigma^2 = 7.697$, $\chi^2(1764) = 12146.823$, $p < .001$). As seen in Table 9, with all control variables added, significant effects were seen for race (Caucasian vs. African American), age² (quadratic), and previous anxiety rating. Depression ratings at the previous assessment significantly predicted current anxiety ($\beta = -0.189$, $t(4398) = -2.258$, $p = .024$). A one-point increase in previous depression was associated with a 0.96% increased probability of a current 2 or 3 anxiety rating.

The unconditional model for depression showed significant variance in ratings between children ($\sigma^2 = 7.013$, $\chi^2(1764) = 11405.995$, $p < .001$). As seen in Table 10, after all control variables were included in the model, significant effects were observed for gender,

time in care, age, age² (quadratic), and previous depression rating. There was no significant effect for previous anxiety rating on current depression rating odds ($\beta = -0.136$, $t(4400) = -1.471$, $p = .141$).

Taken together, the results above suggest a unidirectional relationship between greater depression rating predicting greater odds of later serious anxiety.

Traumatic stress. The unconditional model for traumatic stress showed significant variance in scores between children ($\sigma^2 = 0.230$, $\chi^2(1764) = 21,924.883$, $p < .001$). As displayed in Table 11, with all control variables included, significant effects were observed for Hispanic origin (unknown/missing vs. non-Hispanic), time in care, age² (quadratic), and previous traumatic stress score.

Previous anxiety rating did not significantly predict current traumatic stress ($\beta = 0.019$, $t(1764) = 1.579$, $p = .115$). Similarly, when previous traumatic stress was entered into the anxiety model it did not significantly predict anxiety ($\beta = -0.215$, $t(4398) = -1.676$, $p = .094$). These results suggest no reciprocal or unidirectional relationships between anxiety and traumatic stress over time.

Previous depression significantly predicted current traumatic stress ratings. A one-unit higher rating in earlier depression was associated with a 0.03 unit increase in current traumatic stress ($t(1764) = 2.243$, $p = .025$). And in the depression model, previous traumatic stress predicted current depression. A one-point higher rating in traumatic stress was associated with a 6.44% increased probability of a subsequent 2 or 3 depression rating ($t(4400) = -2.094$, $p = .036$). These results suggest a reciprocal relationship between traumatic stress and depression over time.

Externalizing. The unconditional model for externalizing problems showed significant variance in scores between children ($\sigma^2 = 0.437$, $\chi^2(1764) = 24,480.032$, $p < .001$). As seen in Table 12, with all control variables included, significant effects were observed for gender, race (Other/unknown vs. African American), age² (quadratic), and previous externalizing score.

Previous anxiety predicted current externalizing problems. A one-unit increase in anxiety was associated with a 0.04 unit decrease in later externalizing ($t(1764) = -2.177$, $p = .030$). In the anxiety model, earlier externalizing did not significantly predict current anxiety ($\beta = -0.205$, $t(4398) = -1.878$, $p = .060$). These results suggest a negative unidirectional relationship between anxiety and externalizing where earlier anxiety predicts lower future externalizing problems.

Previous depression did not significantly predict future externalizing problems ($\beta = -0.004$, $t(1764) = -0.235$, $p = .814$). When previous externalizing scores were entered into the depression model, a significant effect of earlier externalizing problems was associated with subsequent odds of depression. A one-unit increase in externalizing problems predicted a 2.05% increase in the probability of a subsequent 2 or 3 depression rating ($t(4400) = -2.201$, $p = .028$). Taken together, these results suggest a unidirectional relationship between externalizing problems and depression. Externalizing problems predict later depression but depression does not predict later externalizing problems.

Optimism. The unconditional model for optimism showed significant variance in scores between children ($\sigma^2 = 6.33287$, $\chi^2(1764) = 10,950.124$, $p < .001$). As seen in Table 13, with all control variables included, significant effects were observed for gender and

previous optimism score. The quadratic component to age was not significant and was therefore removed for a more parsimonious model.

Earlier depression did not significantly predict the odds of increased optimism ($\beta = -0.077$, $t(4402) = -0.978$, $p = .328$). When entered into the depression model, previous optimism significantly predicted the odds of serious depression ratings. A one-unit decrease in optimism was associated with a 1.37% increase in the probability of a later 2 or 3 depression rating ($t(4400) = -2.310$, $p = .021$). These results suggest a unidirectional relationship between depression and optimism where a lack of optimism predicts later severity of depression odds.

Environmental Factors

Family functioning. The unconditional model for family functioning showed significant variance in scores between children ($\sigma^2 = 0.331$, $\chi^2(1764) = 13,066.201$, $p < .001$). As seen in Table 14, with all control variables included, significant effects were observed for time, age, and previous family functioning. The quadratic component to age was not significant and was therefore removed for a more parsimonious model.

Earlier depression did not significantly predict changes in family functioning ($\beta = 0.024$, $t(1764) = 1.318$, $p = .188$). Similarly, when entered into the depression model, earlier family functioning did not significantly predict a change in odds of later depression ($\beta = -0.073$, $t(4400) = -0.925$, $p = .355$). These results suggest no reciprocal or unidirectional relationships between family functioning and depression over time.

Community. The unconditional model for community involvement showed significant variance in scores between children ($\sigma^2 = 5.606$, $\chi^2(1764) = 10,302.430$, $p < .001$). As displayed in Table 15, with all control variables included, significant effects

were observed for gender, time, age, and previous community involvement. The quadratic component to age was not significant and was therefore removed for a more parsimonious model.

Earlier depression did not significantly predict changes in community involvement ($\beta = 0.061, t(1764) = 0.775, p = .438$). Similarly, when entered into the depression model, earlier community involvement did not significantly predict a change in odds of later depression ($\beta = -0.049, t(4400) = -0.849, p = .396$). These results suggest no reciprocal or unidirectional relationships between community involvement and depression over time.

School functioning. The unconditional model for school functioning showed significant variance in scores between children ($\sigma^2 = 0.303, \chi^2(1764) = 13,142.303, p < .001$). As seen in Table 16, with all control variables included, significant effects were observed for gender, race (Caucasian and “other/unknown” vs. African American), time, age, and previous school functioning score. The quadratic component to age was not significant and was therefore removed for a more parsimonious model.

Earlier depression did not significantly predict changes in school functioning ($\beta = 0.035, t(1764) = 1.905, p = .057$). When entered into the depression model, earlier school functioning significantly predicted changes in odds of later depression. A one-unit decrease in school functioning was associated with a 2.73% increase in probability of later 2 or 3 depression ratings ($t(4400) = -3.566, p < .001$). Taken together these results suggest a unidirectional relationship between depression and school functioning, where earlier poor school functioning predicts later serious depression.

Placement Type. Kinship care. The unconditional model for kinship placement showed significant variance in scores between children ($\sigma^2 = 3.813, \chi^2(1683) = 3941.931, p$

< .001). As seen in Table 17, with all control variables included, significant effects were observed for race (Caucasian vs. African American), age, age² (quadratic), and previous kinship placement.

Earlier anxiety did not significantly predict kinship care placement ($\beta = -0.317$, $t(3821) = -1.058$, $p = .290$). Similarly, when entered into the anxiety model, previous placement in kinship care did not predict later anxiety rating odds ($\beta = 0.307$, $t(3828) = 1.747$, $p = .081$).

Similar to the anxiety results, earlier depression did not significantly predict later kinship care placement ($\beta = 0.102$, $t(2203) = 0.293$, $p = .769$). And placement in kinship care did not predict later depression rating odds ($\beta = 0.302$, $t(3830) = 1.660$, $p = .097$). Together these results suggest no relationship, either unidirectional or bidirectional between placement in kinship care and anxiety or depression ratings over time.

Foster care. The unconditional model for foster care placement showed significant variance in scores between children ($\sigma^2 = 15.684$, $\chi^2(1683) = 18,974.345$, $p < .001$). As displayed in Table 18, with all control variables included, significant effects were observed for time, age, age² (quadratic), and previous foster care placement.

Earlier anxiety did not significantly predict foster care placement ($\beta = 0.031$, $t(3821) = 0.131$, $p = .896$). However, placement in foster care significantly predicted later anxiety rating odds. Being placed in a foster care setting was associated with a 1.80% decrease in the probability of a later 2 or 3 anxiety ratings ($t(3828) = 2.587$, $p = .010$), compared to other out-of-home care placements.

Similar to the anxiety results, earlier depression did not significantly predict subsequent foster care placement ($\beta = 0.282$, $t(3821) = 1.041$, $p = .298$). However,

placement in foster care significantly predicted later depression rating odds. Being placed in a foster care setting was associated with a 3.22% decrease in the probability of a later 2 or 3 depression ratings ($t(3830) = 2.926, p = .003$), compared to other out-of-home care placements.

Taken together, results from all four models suggest being placed in foster care is associated with significantly lower subsequent anxiety and depression ratings, while depression and anxiety ratings do not predict subsequent placements in foster care over other out-of-home placement types.

Treatment foster care. The unconditional model for treatment foster care placements showed significant variance in scores between children ($\sigma^2 = 14.734, \chi^2(1683) = 18,978.944, p < .001$). As seen in Table 19, with all control variables included, significant effects were observed for race/ethnicity (Caucasian vs. African American, Hispanic origin unknown vs. non-Hispanic), time in care, time between assessments, age² (quadratic), and previous treatment foster care placement.

Earlier anxiety ratings did not significantly predict subsequent treatment foster care placement over other placements ($\beta = 0.287, t(3821) = 1.123, p = .262$). Similarly, in the anxiety model, placement in treatment foster care did not predict later anxiety rating odds ($\beta = 0.189, t(3828) = 1.301, p = .193$).

Similar to the anxiety results, previous depression rating did not significantly predict treatment foster care placement over other placement types ($\beta = 0.113, t(3821) = 0.411, p = .681$). And in the depression model, placement in treatment foster care did not predict later depression rating odds ($\beta = 0.111, t(3830) = 0.766, p = .444$). Together these

results suggest no relationship, either unidirectional or bidirectional between placement in treatment foster care and anxiety or depression ratings over time.

Residential care. The unconditional model for residential care placements showed significant variance in scores between children ($\sigma^2 = 14.547$, $\chi^2(1683) = 31,546.012$, $p < .001$). As displayed in Table 20, with all control variables included, significant effects were observed for gender, ethnicity (non-Hispanic vs. Hispanic and Hispanic origin unknown), age² (quadratic), and previous residential care placement.

Earlier anxiety did not significantly predict residential care placement over other placement types ($\beta = 0.213$, $t(3821) = 0.649$, $p = .516$). Similarly, in the anxiety model, placement in residential care did not predict later anxiety rating odds ($\beta = -0.341$, $t(3828) = -1.831$, $p = .067$).

Similar to the anxiety results, previous depression rating did not significantly predict residential care placement over other placement types ($\beta = 0.056$, $t(3821) = 0.185$, $p = .853$). And in the depression model, placement in residential care did not predict later depression rating odds ($\beta = -0.131$, $t(3830) = -0.673$, $p = .501$). Together these results suggest no relationship, either unidirectional or bidirectional between placement in residential care and anxiety or depression ratings over time.

Residential treatment. The unconditional model for residential treatment placements showed significant variance in scores between children ($\sigma^2 = 12.090$, $\chi^2(1683) = 77,597.989$, $p < .001$). As displayed in Table 21, with all control variables included, significant effects were observed for gender, age² (quadratic), and previous residential treatment placement. With Hispanic origin variables included, the model would not run.

Therefore, the Hispanic origin unknown/missing variable was removed from the final models.

Earlier anxiety did not significantly predict residential treatment placement over other placement types ($\beta = 0.367, t(3821) = 0.657, p = .511$). However, earlier placement in residential care did significantly predict later anxiety rating odds. Being previously placed in a residential treatment setting predicted a 18.09% increase in the probability of later 2 or 3 anxiety ratings ($t(1620) = -4.823, p < .001$). These findings suggest a unidirectional relationship between anxiety and residential treatment where earlier placement in residential treatment predicts later odds of serious anxiety ratings.

Earlier depression significantly predicted the odds of subsequent placement in residential treatment settings. A one-unit increase in earlier depression rating was associated with a 0.39% increased odds of a subsequent residential treatment placement ($t(3821) = 1.936, p = .053$). Similarly, in the depression model, earlier placement in residential care significantly predicted later depression rating odds. Being previously placed in a residential treatment setting predicted a 20.79% increase in the probability of later 2 or 3 depression ratings ($t(1620) = -4.650, p < .001$). These findings suggest a reciprocal relationship between depression and residential treatment, where increased depression is associated with greater future probability of being placed in residential treatment and being placed in residential treatment is associated with greater future probability of serious depression ratings.

Institution. The unconditional model for institutional placements showed significant variance in scores between children ($\sigma^2 = 13.612, \chi^2(1683) = 70,833.995, p < .001$). As displayed in Table 22, with all control variables included, significant effects

were observed for gender, time between assessments, age, and previous institutional placement. Similar to the residential treatment model, with Hispanic origin variables included, the model would not run. Therefore, the Hispanic origin unknown/missing variable was removed from the final models.

Earlier anxiety did not significantly predict institutional placements over other placement types ($\beta = 0.429$, $t(3821) = 0.706$, $p = .480$). However, in the anxiety model, earlier placement in an institutional setting significantly predicted later anxiety rating odds. Being previously placed in an institutional setting predicted a 5.50% increase in the probability of later 2 or 3 anxiety ratings ($t(3828) = -2.272$, $p = .023$).

Similar to the anxiety results, earlier depression did not significantly predict subsequent institutional placements over other placement types ($\beta = 0.343$, $t(3821) = 0.626$, $p = .531$). However, in the depression model, earlier placement in an institutional setting significantly predicted later depression rating odds. Being previously placed in an institutional setting predicted a 15.57% increase in the probability of later 2 or 3 depression ratings ($t(3830) = -3.630$, $p < .001$).

Taken together these results suggest unidirectional relationships between previous institutional placements and later severity of depression and anxiety ratings, while earlier anxiety and depression did not predict likelihood of later institutional placements.

Other/unknown. The unconditional model for other/unknown placements showed significant variance in scores between children ($\sigma^2 = 11.641$, $\chi^2(1683) = 17,066.780$, $p < .001$). As displayed in Table 23, with all control variables included, significant effects were observed for age, age² (quadratic), and previous placements categorized as other/unknown.

Earlier anxiety did not significantly predict subsequent placements designated as other/unknown over other placement types ($\beta = -0.434$, $t(3821) = -1.647$, $p = .100$). Similarly, earlier placement in a setting designated as other/unknown did not predict later anxiety rating odds ($\beta = -0.196$, $t(3828) = -1.230$, $p = .219$). These results suggest no relationship, either unidirectional or bidirectional, between placements categorized as other/unknown and anxiety ratings over time.

Earlier depression significantly predicted the odds of subsequent placement in settings designated as other/unknown. A one-unit increase in earlier depression rating was associated with and 0.11% decreased odds of a subsequent other/unknown placement ($t(3821) = -2.878$, $p = .004$). However, earlier placement in a setting designated as other/unknown did not predict later depression rating odds ($\beta = -0.197$, $t(3830) = -1.259$, $p = .208$). These results suggest a unidirectional relationship, where more severe depression ratings predict later decreased probability of placement in other/unknown placement types, but other/unknown placements do not predict later depression ratings.

In summary, no associations were seen between kinship care, treatment foster care, and residential placements and anxiety or depression ratings in either direction. Foster care placements showed negative unidirectional relationships with both anxiety and depression ratings, where placement in foster care was associated with later lower depression and anxiety ratings. Residential treatment placements showed a positive reciprocal relationship with depression ratings and a unidirectional relationship with anxiety, where placement in residential treatment predicted later increased anxiety ratings but not vice versa. Institutional placements showed a positive unidirectional relationship with both later anxiety and depression. Finally, other/unknown placements were

negatively associated with depression only, where lower depression was associated with the probability of future other/unknown placements. However, as mentioned in the methods section, the placement type results should be interpreted with caution, since the dichotomous models displayed low reliability and data imputation was not feasible.

Discussion

Our Study 2 hypothesis, that family functioning, community involvement, placement type, school functioning, co-occurring anxiety/depression, traumatic stress, optimism, and externalizing problems would display reciprocal relationships over time with internalizing problems was generally not supported. Figure 5 presents a summary of our observed significant relationships with the direction of the relationship over time. Positive relationships are represented with a solid line, and negative relationships are represented with a dashed line. Only two factors (traumatic stress and residential treatment placements) were reciprocally related to depression. And no factors were reciprocally related to anxiety. However, several unidirectional relationships were observed. The relationships, or lack of relationships, between anxiety, depression, and each factor are discussed in detail below.

Internal Factors

The internal risk and protective factors in the current study included optimism, co-occurring anxiety and depression, traumatic stress, and externalizing problems. Optimism was investigated for its reciprocal relationship with depression only, while co-occurring anxiety and depression, traumatic stress, and externalizing problems were investigated in relation to both anxiety and depression.

Co-occurring anxiety and depression. Our results indicated a unidirectional relationship between depression and anxiety where earlier depression predicted later anxiety, but not the other way around. These findings do not support any of the theories outlined earlier. The correlated liabilities, causal, and diathesis-anxiety models were all working on the presumption that depression follows anxiety in childhood and adolescence.

According to these theories, anxiety should have predicted later depression, while the reverse was the only significant model in our study. However, our findings were corroborated in the causal model analyses from Cohen et al. (2014) where previous depression symptoms predicted anxiety (the reverse was not statistically significant). Although their results did not support a causal model, they were similar to our findings.

It is possible that children in out-of-home care experience internalizing problems differently from what is observed in community samples. In the general population, anxiety disorders are approximately twice as prevalent (31.9%) as mood disorders (14.3%) in adolescents (Merikangas et al., 2010). However, in our study the mean depression rating across all children ($M = 0.74$, $SD = 0.70$) was similar to that of anxiety ($M = 0.80$, $SD = 0.73$). Stevens, Brice, Ale, and Morris (2011) found significantly higher depression scores in a sample of 31 adolescents from foster care compared to 25 community controls, while the mean anxiety scores were similar in both groups. These findings might suggest that children in out-of-home care experience the onset and course of depression and anxiety differently from that of other children. In particular, the age of onset for depression may be much lower than the general population, which would explain why our findings only showed depression to predict later anxiety instead of the more common course of anxiety predicting later depression.

The increased incidence of trauma and other adverse childhood experiences may be associated with earlier age-of-onset for mental health problems. In a community sample of 2,362 Mexican adults, Benjet, Borges, and Medina-Mora (2010) found that childhood adversities, including abuse, neglect, and family risk factors were associated with mood and anxiety onset in childhood and adolescence. Since children in out-of-home care

experience increased incidence of adversity, it stands to reason that age-of-onset for internalizing problems may be earlier than in the general population, which may also affect the course and related disorder onset for anxiety and depression.

In regard to our hypothesis for a resilience feedback mechanism, we expected both models to be statistically significant. This was not supported by our findings. It is possible that, although depression and anxiety are correlated and often comorbid in children and adolescence, levels of anxiety and depression do not mutually exacerbate or ameliorate future incidence of each internalizing problem for children in out-of-home care. Considering our findings, focusing on preventing and improving symptoms of depression may be an effective way of also preventing anxiety in out-of-home populations as higher depression was associated with later odds of anxiety. It is also possible, as noted in Study 1, that there was a confounding effect for detecting anxiety in the presence of traumatic stress symptoms as the language used in the CANS anxiety and avoidance items have some overlap. The issue of common method variance is discussed in more detail in the limitations section. If general anxiety was being classified as traumatic stress by CANS raters, this might explain the lack of a reciprocal anxiety-depression relationship in the current study (particularly in light of the traumatic stress results).

Traumatic stress. In line with our hypothesis, our findings indicated a reciprocal relationship between traumatic stress and depression over time. Our findings are similar to that of Aderka et al. (2011) where reductions in PTSD were associated with later reductions in depression and vice versa in a sample of 73 Israeli children. These researchers also found that the path between PTSD and later depression accounted for more variance in depression than depression did for PTSD, and fully mediated the effect of

time on depression. However, we were not able to directly compare the magnitude of the relationships in our study because the two outcomes were of different data types (continuous vs. ordinal). Despite this limitation, our results suggest that treatment of both depression and PTSD simultaneously may be an important consideration for children in out-of-home care. In a study comparing cognitive behaviour therapy and child-centered therapy for sexual abuse related PTSD in 183 children, Deblinger, Mannarino, Cohen, and Steer (2006) found that depression levels at pre-treatment were related to the total number of PTSD symptoms at post-treatment and 12-month follow up for the children receiving child-centered therapy only. They also found small effects in favour of the cognitive behaviour therapy group displaying lower depression scores than the child-centered therapy group at post-treatment, 6-, and 12-month follow up. Their findings support the use of therapies designed to address the complex mental health needs for children who have experienced trauma. Considering the reciprocal relationship seen in the current study, addressing both mental health problems concurrently may be particularly important for children in out-of-home care.

We did not observe the same expected reciprocal relationship between anxiety and traumatic stress. Despite the significant findings in Study 1 there were also no unidirectional effects between traumatic stress and anxiety over time. Taken together these findings suggest a correlational/comorbid association between anxiety and traumatic stress but neither disorder appears to be a precursor to the other in out-of-home care samples.

Externalizing. In our results, anxiety negatively predicted later externalizing scores, while externalizing predicted later odds of serious depression. These relationships were

unidirectional. If interpreted alone, the anxiety findings suggest a protective effect for anxiety against later behavioural problems, while the depression results support the failure hypothesis (externalizing behaviours impede functioning and lead to internalizing problems). However, taken together, internalizing problems display a complex reciprocal relationship to externalizing problems, which partially support the adjustment erosion theory (both internalizing and externalizing lead to academic and social functioning problems and are mutually reinforced over time). In both Morin et al. (2017) and Weeks et al. (2016) reciprocal relationships were observed between internalizing and externalizing, which partially support our findings if interpreted within an aggregate internalizing construct. However, from our findings it appears that different aspects of internalizing may be driving different pathways of the relationship. As Blain-Arcaro and Vaillancourt (2017) also observed, the relationship between externalizing behaviour and later depression was unidirectional. While anxiety alone and externalizing problems have not been investigated reciprocally elsewhere in this way, our findings show a unidirectional relationship with anxiety predicting later reductions in externalizing. These results highlight the importance of distinguishing between different internalizing problems for children in out-of-home care.

Considering the unidirectional relationship we also observed between depression and later anxiety, there may be a more complex reciprocal relationship between anxiety predicting later decreased externalizing behaviour, externalizing predicting later depression, and depression reinforcing the effect in predicting later anxiety. While this cycle includes a protective effect of anxiety, it provides some support for an amalgamation of the adjustment erosion hypothesis for externalizing with the correlated liabilities model for anxiety and depression. In this context, there may be common risk factors predisposing

children to anxiety, depression, and externalizing problems; and externalizing problems lead to social and academic problems which lead to increased levels of depression, and then depression leads to greater anxiety. With school functioning included in this cycle, a developmental cascades model might better explain these observed relationships. The developmental cascades model will be discussed in the school functioning section below.

Optimism. We found a unidirectional relationship between optimism predicting later depression odds. These findings did not support our hypothesis of a feedback resilience mechanism between optimism and depression. It appears that a lack of optimism is a precursor to depression but depression is not a precursor to a lack of optimism. It is possible that the lack of reciprocal relationship was the result of the CANS capturing trait optimism over state optimism. Since the CANS does not ask raters for a specific time frame for evaluating the item in question, raters may have used information gained from past encounters and evaluations in completing the optimism item. In Table 13 we see that optimism does not change significantly across time in care or age, supporting the possibility that the CANS is capturing trait rather than state optimism. However, it is equally possible that children in out-of-home care maintain a genuinely different view of the future than children who live at home.

Children in out-of-home care face many adversities that may predispose them to lower overall optimism about the future. In a sample of 46 children in foster care in the United States (8 to 16 years old), Beals-Erickson (2010) found the number of negative life events children reported predicted lower optimism, accounting for 10% of the variance in optimism scores. Similarly, in a community sample of 2,981 adults (18 to 65 years old) Broekhof et al. (2015) found that childhood emotional maltreatment was associated with

lower optimism in adulthood. They further found that individuals with an anxiety or depressive disorder had lower optimism, and severity of depression was inversely related to optimism. These findings and those from Beals-Erickson (2010) suggest childhood maltreatment and adverse experiences are associated with lower optimism, that may persist beyond childhood into adulthood. And as seen in our results, lower optimism is related to later increased depression odds. Therefore, addressing optimism levels in childhood and at entry to care may provide a protective effect against later depression.

Interventions discussed earlier for depression that include a focus on improving optimism (i.e. the Penn Resiliency Program) have shown promising results in pilot testing, but mixed results overall (Reivich et al., 2013). However, this type of prevention program might be adapted to address the specific pessimistic views of children in out-of-home care. It is also possible that the mixed results seen for the Penn Resiliency Program and the unidirectional relationship seen in our study are a reflection that trait optimism is difficult to change, and other programs (such as cognitive behaviour therapy based programs discussed in the traumatic stress section) may be more successful in preventing and treating depression in children in out-of-home care.

Environmental Factors

The environmental risk and protective factors in the current study included family functioning, community involvement, school functioning, and placement type. Placement type was investigated for its reciprocal relationship with both depression and anxiety, while family functioning, community involvement, and school functioning were only investigated in relation to depression, based on results from Study 1.

Family functioning. In our sample, family functioning did not show a relationship over time with depression, either reciprocally or unidirectionally. Considering the results from Study 1 where family functioning did significantly predict depression odds, the relationship between these two constructs may be only correlational. The studies discussed previously regarding family functioning and depression appeared to show discrepant findings, possibly due to the diverse aspects of family that can be measured. Nelemans et al. (2014) and Barbot et al. (2014) found reciprocal relationships between different aspects of family functioning and depression, but no reciprocal relationships were observed between one single aspect of family functioning and depression. Similarly, Sheeber et al. (1997) and Wang and Kenny (2014) only found unidirectional relationships, where family functioning predicted later depression, but not the other way around. Further, these studies did not use out-of-home care samples.

It is possible that, for children in out-of-home care, depression and overall family functioning are correlated at any single time point (as seen in Study 1) but no temporal relationship exists. For children in out-of-home care, the relationship with foster families and residential staff may be more relevant in predicting later changes in depression and anxiety. Bell et al. (2013) found that parenting practices of foster families accounted for 1.4% of the variance in emotional problems for children in out-of-home care. Other cross-sectional studies have shown that internalizing problems in foster children are related to poor treatment by foster families, lower levels of foster parent acceptance, insecure attachment to foster mothers, and poor foster parent-child relationships (Orme & Buehler, 2001). Further research in this area should include the role of foster parents and other

potential attachment figures (for children not in more restrictive placements) in relation to internalizing outcomes in this population.

It should also be noted that the Cronbach's alpha for the family functioning composite in this study was only .553. While this may have been the result of the measure being comprised of only 2 items, it is also possible that family functioning is too broad a concept to be accurately assessed using only 2 items.

Community. Similar to the findings regarding family functioning, community involvement did not display a unidirectional or reciprocal relationship with depression over time in our study. These findings did not support our hypothesis. The only study examining school-community connectedness over time found a unidirectional relationship between school-community connectedness and later depression (Shochet et al., 2006). However, this study examined connectedness in a community sample. As mentioned previously, children in out-of-home care may be less connected to the community as a result of placements outside of the children's original neighbourhood. The mean community rating in our sample was 1.34 (SD = 0.87) indicating the average child had significant to limited community ties. While there has been some suggestion that placing children in out-of-home placements with proximity to children's family home may improve children's functioning for several reasons (Berrick, 2006), a connection to the community does not appear to be a significant factor in improving internalizing symptoms for children in out-of-home care in particular.

While results from Study 1 suggest a correlational relationship between depression and community connectedness, results from the current study suggest community connectedness does not play a significant role in the odds of depression over time.

School functioning. Our results showed a unidirectional relationship between school functioning and subsequent depression odds. These findings did not support our hypothesis of a reciprocal feedback mechanism. However, functioning well in school does appear to be related to later odds of serious depression. While studies in community samples suggest a reciprocal relationship between school functioning and depression (Verboom et al., 2014; Weeks et al., 2016; Weidman et al., 2015), this study was the first to examine this relationship in children in out-of-home care. Our results suggest that, for children in out-of-home care, functioning well in school may contribute to lower odds of later depression. Therefore, ensuring children placed in out-of-home care are functioning well in school may also provide a protective effect against later depression.

Although the two school-related models alone did not display a reciprocal relationship with depression, when taken into consideration with other finding, a more complex mechanism may exist. As mentioned in the discussion on externalizing behaviours, there may be a more complex cycle between anxiety, externalizing, school functioning, and depression. This cycle was discussed in relation to two separate theories from the anxiety/depression link and internalizing/externalizing link. In line with this thinking, a dual cascade model is a more comprehensive explanation for our findings. This model originated from earlier work in antisocial behaviour where a dual failure model was proposed to explain deviant peer group membership and subsequent delinquency (Patterson, DeBaryshe, & Ramsey, 1989). In the dual failure model, parenting behaviours contribute to behavioural problems, which then lead to school and social failure/rejection. These failures then lead to association with delinquent peers and delinquent behaviour. Adaptations of the dual failure model include the development of internalizing behaviours

after school and social failure. These models can be categorized more generally as cascade models. Developmental cascades can be defined as interactions between various domains of development over time resulting in adaptation or maladaptation in other areas of development (Masten & Cicchetti, 2010). These models are often used in resilience and developmental research and are a more holistic way of explaining the results from our school functioning, externalizing, depression, and anxiety models. The possible cycle observed in our results where externalizing behaviours and school functioning predict later depression, depression predicts later anxiety, and anxiety negatively predicts later externalizing problems fits well with a dual cascades model. Although the role of anxiety as a protective rather than risk factor for externalizing problems creates a more complex cycle over time.

Placement type. Our results suggest complex relationships between anxiety, depression, and the numerous placement types included in this study. No relationships were observed between kinship care, treatment foster care, or residential care and anxiety or depression over time, in either direction. The results regarding kinship care are not surprising considering kinship care did not predict difference in odds for anxiety or depression in Study 1. Considering the significant findings for treatment foster care and residential care in Study 1, results from the current study suggest only a correlational relationship between these placements and anxiety and depression.

Placement in foster care was associated with lower odds of later anxiety and depression ratings. These relationships were unidirectional. Since children are typically placed in less restrictive settings when initially removed from home, these findings may simply reflect changes in anxiety and depression associated with removal from stressful

living situations where children are often experiencing abuse and/or neglect or witnessing stressful events.

Residential treatment care and institutional placements were associated with greater severity of later anxiety and depression ratings. Additionally, depression displayed a reciprocal effect with residential treatment placements, where higher depression ratings were associated with greater odds of later placement in residential treatment. These results may reflect the observation made by McMillen et al. (2005) that internalizing problems are often appear after entry to out-of-home care while behavioural problems tend to appear before entry to care. This line of reasoning may be expanded to placement in residential treatment and institutional settings where children will typically receive more in-depth assessments than other placements. Therefore, internalizing problems not previously identified by caregivers or social workers may be detected in these placements, and reflected in subsequent CANS evaluations. It is also possible that these findings are reflecting the results observed in the externalizing behaviour models where depression followed externalizing symptoms. Since children may be placed in more restrictive settings as a result of externalizing behaviours, the findings regarding residential treatment and institutional placement types may be confounded by earlier externalizing behaviours. Further, the reciprocal relationship between depression and residential treatment may be evidence of a resilience feedback mechanism between externalizing and depression where initial maladaptation in depression or externalizing problems initiate future maladaptation in both areas, resulting in further placements in residential treatment care.

Finally, depression displayed a unidirectional negative relationship with placements classified as “other/unknown,” where greater depression was associated with lower odds

of later placement in “other/unknown” placements. Recall, these placements consisted mainly of temporary and emergency placements, but also included independent and alternative living, college, pre-finalized adoptive homes, respite care, and runaway/unknown whereabouts. It is possible that children with elevated depression are less likely to be subsequently placed in independent type living arrangement. However, the reference category is all other placement types. Therefore, the results may be interpreted as children with more severe depression having increased odds of being placed in more long-term and supervised out-of-home placements (compared to the temporary, independent, and unknown living situations that make up the “other” category).

Overall, results from the placement type models suggest unidirectional relationships between certain placement types (residential treatment, institutional placements, and foster care) and later internalizing problems. However, as mentioned previously, results regarding placement type should be interpreted with caution, as missing data was not imputed in order to maintain consistency across models and studies. Further, the Bernoulli models with placement types as the dependent variables displayed overall low reliability.

Implications

Two main implications have arisen from this study. First, the findings in our study do not support an overall feedback mechanism of resilience. Alternate theoretical frameworks may better explain our results. Second, the significant and non-significant relationships found in this study may help focus intervention efforts on the most effective areas.

Mechanism of change. Overall, our findings do not support the resilience feedback mechanism proposed by Kumpfer. Kumpfer (1999) describes the process of resilience as

short- and long-term coping learned through gradual exposure to increasing stressors that help an individual rebound with resilient functioning. With so many components included in the model, Kumpfer (1999) suggests focusing research on mini-processes in an effort to build effective prevention programs. However, the methods used to define and test these micro-processes were relatively novel/exploratory in nature. We aimed to explore these mini-processes using individual reciprocal analyses between risk/protective factors and our outcomes of interest. The only two reciprocal relationships observed were for depression and traumatic stress, and depression and placement in residential treatment. All other significant relationships were unidirectional. These findings suggest that the resilience feedback mechanism cannot be understood using the mini-processes in the way they were defined in this study. Developing models that are more cohesive, including indirect paths, may capture the internalizing resilience building process in children more accurately.

Although there were few reciprocal relationships identified in this study, several unidirectional relationships were observed. These relationships support the possibility of a dual developmental cascades model. As outlined earlier, developmental cascades are interactions between developmental domains over time resulting in adaptation or maladaptation (Masten & Cicchetti, 2010). This concept is similar to that of Kumpfer's resilience process, but integrates the two transactional points (person-environment interaction and resilience process) proposed by Kumpfer into a single process. Recent research under a developmental cascades model has evaluated the relationships between several factors in our study within this more dynamic model. Weeks et al. (2016) examined the relationships between internalizing, externalizing, and school achievement under a

dual cascades model. In a sample of 6,425 children 4 to 17 years old, they found a reciprocal relationship between internalizing and externalizing, but a more complicated relationship between internalizing and school achievement where greater internalizing predicted greater school achievement but poor school achievement also predicted greater internalizing. Finally, they observed a negative reciprocal relationship between externalizing and school achievement. In our study a similarly complex cycle was observed between measures where externalizing behaviours and school functioning predicted later depression, depression predicted later anxiety, and anxiety negatively predicted later externalizing problems. Although Weeks et al. (2016) observed several reciprocal relationships over time and our study displayed mainly unidirectional relationships, both studies provide evidence of a complex dual cascades cycle over time in both community and out-of-home samples. However, it should be noted that the reciprocal findings from Weeks et al. (2016) would equally support the mini-processes described by Kumpfer (1999). Despite this, a more thorough application of the dual developmental cascades model using data from our study is proposed in our general discussion section.

Intervention. Results from the current study provide some insight into the factors that precede and follow depression and anxiety over time in out-of-home populations, and therefore may serve as effective targets for prevention and intervention programs for these children. The only internal protective factor examined in this study, optimism, showed a unidirectional relationship in predicting later depression odds. This suggests that optimism may be an effective area to target for resilience-based interventions. As described earlier, the Penn Resiliency Program includes increasing optimism as one of the seven components targeted by the program. However, the program has shown mixed results in the

effectiveness of reducing and preventing depression (Reivich et al., 2013). Considering the consistency in both out-of-home and community samples in the link between low optimism and depression (Bell et al., 2013; Dooley et al., 2015; Keyfitz et al., 2013; Smokowski et al., 2014), the Penn Resiliency Program may be improved by modifying some of the other targeted components to improve depression outcomes. Alternatively, other prevention and intervention programs might be improved by including optimism as a targeted component.

As in Study 1, our findings in this study also suggest that interventions that target a large number of areas, such as Multidimensional Treatment Foster Care (MTFC), may be the most effective in reducing and preventing internalizing problems in out-of-home populations. At the child level, MTFC focuses on strength building, social skills coaching, and academic support, with improved outcomes expected in social, school, and behavioural functioning (Leve, Fisher, & Chamberlain, 2009). Considering the relationships observed in our study between anxiety, depression, school functioning, and externalizing behaviour, the targeted areas of intervention and expected outcomes of MTFC are in line with these observed relationships. Further, since MTFC already includes a focus on strength building via individual therapy, it would be easily adapted to include a focus on building optimism as part of this process in order to target depression outcomes. In addition, the individual therapy component could be further adapted to include a therapeutic component to address emotional well-being in terms of traumatic stress, internalizing, and externalizing symptoms (which were also significant relationships in our study). Although very few relationships between anxiety and other factors were examined in this study, results provide support for including anxiety prevention under the MFTC approach as well

because it fit into the possible cycle between school, externalizing behaviours, and depression.

Limitations

There are several limitations to the current study, including the frequent assumption that reciprocal and cross-lagged models are sometimes used as evidence of causal relationships, comparison of effect sizes across models, and the assessment frequency/time intervals between assessments. In addition, as in Study 1, common method variance and missing data were also limitations in the current study.

Causality in reciprocal models. Reciprocal and cross-lagged models are often referred to as causal models. However, these models do not test for true causal relationships. John Stuart Mill's classic approach to demonstrating causality involves meeting three criteria: (a) cause preceding the effect in time, (b) cause and effect are related, and (c) ruling out alternative explanations/confounds (Shadish, Cook, & Campbell, 2002). The ideal method of investigating causation is to use a double blind, random assignment, placebo controlled experimental design in order to observe hypothesized causal relationships between variables. However, with high-risk populations it is not possible to assign individuals to experimental design conditions. Cross-lagged panel models have been developed in an attempt to investigate pseudo-causal relationships over time. These models may meet Mill's criteria to some degree. First, since data are collected across several waves (in our case multiple uneven time points), data from a single time point is never used to predict other variables from within that time point, providing some sense of the independent variables preceding the dependent variables in time. Second, we knew from Study 1 that reciprocal predictors and outcomes were related in our sample.

Third, longitudinal HLM allows for each participant to serve as their own control, eliminating between individual third variable confounds as well as time-invariant covariates/confounds (Duckworth et al., 2010). However, we do not contend that results from the current analyses or other reciprocal analyses test for true causality but rather time sequenced relationships that may serve as indicators of more complex systems of adaptation and maladaptation over time.

Comparing effects. In the current study, several different data types were used in each model, including continuous, ordinal, and categorical outcomes. Although HLM models allow for the calculation of a pseudo R-squared value when all variances are left unfixed, these values cannot be calculated in ordinal cumulative probability models as level-2 error terms are not computed. Additionally, variances in the continuous and Bernoulli models were largely fixed for model stability and parsimony. Therefore, it was not feasible to calculate pseudo R-squared values in the continuous or Bernoulli models. For the few relationships identified as reciprocal (i.e. depression-traumatic stress, depression-residential treatment) it would have been more informative to quantitatively compare both directions of the relationships using a single measure of effect.

Time between assessments. Considering the overall lack of significant reciprocal relationships in this study, there may be methodological limitations hindering detecting such relationships in our data. One important consideration in cross-lagged and reciprocal models is the timing between lagged variables. Masten and Cicchetti (2010) suggest that if assessments are taken too close in time the direction of effects may be lost within the covariance between measures within a single wave. They recommend omitting data or waves to allow for more time between assessment intervals. In our study, the mean time

between assessments was 8.5 months ($SD = 4.1$), which may seem like a sufficient amount of time considering CANS has show clinically relevant change over as little as 3 to 6 months (Chor et al., 2012). However, the hypothesized reciprocal processes under investigation may occur over longer periods throughout development (Masten & Cicchetti, 2010). In this case, using a cut-off of over 12 months or more between assessments, or removing alternating assessments may have revealed additional reciprocal relationships. However, deleting intervals would have reduced the mean number of assessments by 50%, to 2.26 assessments per child in the current data. This would leave few time points for examining reciprocal models considering the first time point contains no lagged variables due to the method used for calculating lags. Finally, the time between assessments displayed a wide range (0.0 to 53.8 months). Although time between assessments was included as a covariate to control for differences between and within children in frequency of assessments, this large variance in assessment frequency may have contributed to our lack of significant relationships. Time between assessments was not a significant predictor of any outcome, with the exception of two placement type variables. Increased time between assessments was associated with increased odds of placement in treatment foster care and institutional care. These findings raise further concerns with the placement type models, but also highlight the possibility that varying assessment times between and within children may be muddling the results of all models. Reciprocal relationships that may exist when time lags are far apart may be masked by other assessment intervals being too close in time. Since our data was provided by a system of care, which uses these assessments as part of a child's care planning, consistently times assessments was not possible or practical.

Consideration should be made regarding the time between assessments for future studies examining reciprocal relationships across development for children in out-of-home care.

Common method variance. As mentioned in Study 1, our analyses were based almost entirely on data from a single measure (using CANS data as both predictor and outcome variables), which can lead to common method variance (Podsakoff et al., 2003). Several remedies to this were discussed in Study 1, including obtaining predictor and outcome variables from different sources, counterbalancing, and improving scale items.

Another remedy, briefly mentioned in Study 1, is to separate predictor and outcome variables by collecting the information at different times (Podsakoff et al., 2003). While Study 1 used all data from each time point, in this study predictor and outcome variables were lagged by one assessment with an average difference of approximately 8 months between predictor and outcome variables. However, considering the results from both studies there may be some evidence of common method variance contributing to results. In Study 1, it was noted that there was some overlap in language between the anxiety item and the avoidance item from the traumatic stress composite score (i.e. avoidance is its own item but also mentioned in the anxiety item, anxiety item also mentions negative events which may relate more to trauma stress). In Study 1, traumatic stress was one of the strongest predictors of anxiety but in Study 2 no relationships over time were observed. While this may indicate common method variance in these constructs from the perspective of having predictors and outcomes collected at separate times, it may equally provide support that the items are measuring two different concepts (otherwise they would likely be more related over time). Further, because CANS ratings are influenced by many sources, the data collected from these sources typically comes from reports and conversations that

occur over several days or weeks, rather than at a single sitting as many other psychometric measures derived from a single source.

Taken together, the discussion from Study 1 regarding obtaining predictor and outcome variables from different sources, counterbalancing, and improving scale items, and the above discussion on separating predictor and outcome across time, the methods used in the current studies satisfy several of the remedies proposed by Podsakoff et al. (2003) regarding common method variance. Therefore, we can assume that any common method variance present in our studies is minimal, but evidence does exist that it may have influenced our results.

Missing data. As noted in Study 1, a large percentage of placement type data was missing in our sample (10.6%). However, because placement type was being used as an outcome variable, the data was not imputed as rounding would have been necessary to conduct the Bernoulli analyses in the current study and rounding has been shown to introduce bias in imputed data (Allison, 2005). Possibly related to the reduced sample size resulting from the 10.6% missing placement type data, the Bernoulli models with placement type dummy variables as outcomes all displayed low average reliability estimates (.204 to .601). Taken together, the missing data and low reliabilities mean the results from the placement type models should be interpreted with caution, and replication is warranted before drawing any overall conclusions.

Future Directions

There are several areas worth further exploration based on the results from this study. As described earlier, the length of time between assessments is an important aspect of reciprocal models that could not be fully controlled here. Future research should aim to

operationalize these reciprocal systems in a more concrete way across childhood in order for measurements to be timed appropriately to capture the hypothesized relationships. Two additional areas for further research were highlighted in our results: the nature of the relationship between anxiety and depression, and evidence of a dual cascades model.

Comorbidity and age of onset. Results from the current study suggest that the relationship between anxiety and depression may present differently in children in out-of-home care compared to those in the general population. While the typical course of internalizing problems suggest frequent comorbidity, with anxiety preceding depression throughout childhood and adolescence (Beesdo et al., 2009), results from our study suggest evidence of the opposite in children in out-of-home care, where depression precedes anxiety. This may be a detection/construct validity issue for the CANS anxiety item. However, outside of traumatic stress, anxiety disorders are studied very little in children in out-of-home care. Further research is warranted into age-of-onset and the course and comorbidity of various internalizing problems in order to better understand the consequences of these disorders for children in out-of-home care. The way in which these disorders develop and influence other areas of functioning may be quite different in populations that have experienced early life trauma and removal from their home environments.

Dual cascades model. Another important finding from this study suggests indirect evidence in support of a dual developmental cascades model regarding internalizing problems for children in out-of-home care. In our study, some paths were not examined due to lack of significance in Study 1 (e.g. depression and social functioning, anxiety and school or social functioning), and lagged paths between predictors were not examined as it

was outside of the scope of our study. However, the unidirectional relationships observed between depression, anxiety, externalizing problems and school functioning are best explained under a dual cascades model. Weeks et al. (2016) similarly found reciprocal relationships between internalizing symptoms, externalizing behaviour, and school achievement in a community sample. Further research is warranted in examining the reciprocal relationships between anxiety, depression, externalizing, and social and school functioning over time. The role of anxiety under this model should also be explored as results from our study suggest a protective effect on externalizing behaviours in Study 2, despite externalizing behaviours appearing as a risk factor for anxiety in Study 1. In addition, meditational analyses may reveal unique paths between these constructs in children in out-of-home care. For example, anxiety may indeed precede depression in children in out-of-home care as well, but fully mediated by externalizing symptoms and therefore not detected in our analyses.

Conclusions

An overall lack of findings in the current study suggest that the resilience process in children in out-of-home care is more complex than can be described by the separate reciprocal analyses we used to explore Kumpfer's (1999) proposed micro-processes. While expected relationships were largely not supported, evidence was observed for a more complex dual developmental cascades model. A possible cycle was observed in our results where externalizing behaviours and school functioning predicted later depression, depression predicted later anxiety, and anxiety negatively predicted later externalizing problems. This series of impairments in functioning fits well with a dual cascades model.

Our findings also suggested a unidirectional relationship between optimism and depression, which may provide insight into prevention and treatment program planning for children in out-of-home care. The other significant relationships observed in our study suggest intervention programs that include a broad range of targeted areas (i.e. internalizing, externalizing, school functioning) may be the most effective in reducing internalizing problems for children in out-of-home care, along with other areas of functioning.

Although the models with placement type as the outcome variables were problematic, the results may suggest that removal from home into foster care is associated with later reduced internalizing symptoms. And other more restrictive placement types may be associated with later severity of symptoms, while kinship care and other placements are not related to earlier or later internalizing symptoms.

Very few reciprocal predictors of anxiety were tested in the current study. Results suggest that outside of traumatic stress, anxiety disorders are not widely studied in out-of-home populations. Since anxiety disorders are often associated with other areas of maladaptation, gaining a better understanding in this area may improve the quality of life more generally for children in out-of-home care.

General Discussion

To date, few studies have examined a large number of factors in a single study of risk and resilience in the internalizing outcomes of children in out-of-home care. The majority of these studies have examined internalizing as a single construct (Bell et al., 2013; McWey, Cui, et al., 2010; Tonmyr et al., 2011), or focused solely on symptoms of depression (Munson & McMillen, 2010; Orton, 2008; Stoner et al., 2015). Few studies have examined anxiety symptoms alone (Heneghan et al., 2013; Legault et al., 2006), and only one examined protective factors (Legault et al., 2006).

In Study 1, we aimed to examine the trajectories of anxiety and depression over time for children in out-of-home care as well as uncover the risk and protective factors associated with anxiety and depression symptoms over time using hierarchical models. Potential risk and protective factors were explored under a comprehensive resilience model based off of a framework proposed by Kumpfer (1999) to include known and suspected factors related to internalizing problems in children, although limited to those factors/areas currently being measured in out-of-home populations in the United States. We found unique trajectories for anxiety and depression. Depression scores tended to increase across age, with a slight quadratic component, while decreasing slightly across time in care. Anxiety scores tended to remain stable over time and age, with a slight quadratic trend across age where anxiety increased slightly across childhood with an equivalent decrease across adolescence. The exploratory resilience models proposed, including all predictors, fit better overall for depression outcomes than anxiety. And relatively few positive predictors were significant for either outcome, particularly for

anxiety. These distinctive models highlight the need to examine anxiety and depression separately in out-of-home populations.

Our models suggested several internal factors related to both anxiety and depression, including: co-occurring anxiety/depression, traumatic stress, and externalizing behaviours. In addition, a lack of optimism was related to greater depression odds. The environmental factors related to both anxiety and depression included trauma/maltreatment and placement type. However, the specific types of trauma and placements related to each disorders varied somewhat between models. Emotional abuse was related to both anxiety and depression, while sexual abuse and school violence were related to anxiety only, and medical trauma, family violence, and total trauma were related to depression only. Placement in residential care, residential treatment, and institutional care were associated with both anxiety and depression, while treatment foster care placements and placements listed as other/unknown were related to anxiety only. The environmental factors family functioning, community involvement, and school functioning were related to depression only. For demographic predictors, gender and age differences were observed in depression odds, while racial differences were observed in anxiety odds.

In Study 2, we explored a hypothesized resilience feedback mechanism as outlined by Kumpfer (1999) to gain a deeper understanding of the relationship over time between anxiety, depression, and the significant factors from Study 1. We used reciprocal time-lagged hierarchical models to test the individual relationships between predictors and outcomes. Overall, the results did not support our hypothesis, with few significant relationships, the majority of which were unidirectional. These findings suggest a more

complex process to resilience against internalizing problems for children in out-of-home care.

Our reciprocal models showed few significant relationships between anxiety symptoms and other factors. Depression predicted later anxiety, while anxiety negatively predicted later externalizing problems. Placement in foster care, residential treatment, and institutional care also predicted later anxiety odds. Several predictors showed unidirectional, and in some cases reciprocal, relationships with depression symptoms. As mentioned, depression predicted later anxiety, while optimism, externalizing behaviours, and school functioning predicted later depression. Traumatic stress displayed a reciprocal relationship over time with depression. Placement in foster care and institutional care predicted later depression odds, while depression predicted future odds of placement in settings categorized as “other/unknown.” Finally, depression displayed a reciprocal relationship over time with placement in residential treatment care.

Taken together, the results from both studies suggest anxiety is fairly stable over time in care and age, with relatively few predictors, and even fewer significant relationships across time. There were no reciprocal relationships observed. While these findings may be due to the methodological limitations discussed in each study (e.g. common method variance, construct validity), it is more likely that these results represent a gap in research, detection, and treatment of anxiety problems, other than traumatic stress, for out-of-home populations.

The findings from the depression model support previous research regarding the factors associated with depressive symptoms in children in out-of-home care, and support the role of less studied factors as well. Traumatic stress, externalizing problems, family

functioning, school functioning, and placement type were confirmed as risk and protective factors for depression in an out-of-home sample, as has been seen in previous research as well (Bell et al., 2013; Munson & McMillen, 2010; Rosenberg et al., 2014; Stoner et al., 2015). Optimism and community involvement had been previously examined mainly in community samples (Caughy et al., 2008; Dooley et al., 2015), and our research suggests these strengths may be relevant in out-of-home samples as well. Further, the reciprocal and unidirectional relationships observed over time reveal additional areas of exploration for the development of prevention and intervention programs in this population.

Overall, very few positive predictors (CANS “strengths”) were associated with either outcome. Future research should focus on the possible cumulative effects of these factors, or other internal and environmental strengths not investigated in the current study.

Theoretical Implications

Two major theoretical implications have arisen from our studies. First, our models provide insight into how internalizing problems fit into an exploratory resilience framework. Second, our anxiety model in particular requires more careful review and modification in order to understand the mechanisms by which resilience against anxiety is developed in children in out-of-home care.

Resilience model. As discussed in Study 1, the proposed model in our studies was developed under Kumpfer’s (1999) resilience framework. The general structure was maintained with indicators pulled from research on depression, anxiety, and internalizing problems in general in both child welfare and community samples. However, these indicators were limited to those currently being assessed on an ongoing basis for children in out-of-home care in the United States. The focus in Study 1 was on the person-

environment interaction, which was evaluated by including all internal and environmental components into a single model, separately for anxiety and depression. While certain components of the model fit well for our internalizing outcomes, others were not relevant in our sample. As seen in Figure 4, for depression, the significant environmental factors associated with internalizing outcomes included family, community, out-of-home placement type, and school, while internal factors included cognitive, behavioural, and emotional functioning. For anxiety, the significant environmental factors included family (i.e. trauma/maltreatment) and out-of-home placement type, while internal factors included only behavioural and emotional functioning. Overall, our proposed model fit moderately well in predicting depression outcomes and less well for anxiety outcomes, based on the number of significant predictors. The findings from Study 1 suggest the proposed model needs further adaptation in order to better describe the process of resilience towards internalizing problems in out-of-home populations.

Considering the lack of research in this area previously, the proposed models were relatively exploratory in nature, piecing together factors from various studies under a detailed and comprehensive framework for resilience. Kumpfer's (1999) model provided the structure necessary to identify and organize a large number of factors into a single model. While many factors were not found to be significant predictors of anxiety or depression in our study, the results provide a starting point for future model development.

In Study 2, the significant predictors from Study 1 were explored in terms of the process of resilience itself, as described by Kumpfer (1999). Individual reciprocal analyses revealed very few reciprocal relationships between predictors and outcomes over time. The majority of relationships examined were unidirectional, suggesting the process of

resilience cannot be captured by evaluating the mini-processes suggested by Kumpfer (1999). However, the results from Study 2 did reveal a more complex pattern of change over time from the included factors. The results showed that externalizing behaviour and school functioning predicted later depression odds, depression predicted later anxiety odds, and anxiety negatively predicted later externalizing behaviours. These relationships are in line with a dual developmental cascades model, rooted in a dual failure model. As described earlier, the dual failure model was originally developed to explain deviant peer groups and delinquency, where parenting behaviours lead to behaviour problems, which in turn result in social and school difficulties and subsequent delinquency and delinquent peers (Patterson et al., 1989). An adaptation of this model into a dual developmental cascades model includes the development of internalizing problems after school and social difficulties arise. The inclusion of cascades suggests a dynamic sequence to maladaptation over time involving various domains and levels of functioning (Masten & Cicchetti, 2010). These cascades are similar to the resilience process described by Kumpfer, but pull mechanisms related to internalizing problems from other theoretical frameworks (i.e. dual failure models). Results from our studies suggest a dual developmental cascades model may describe internalizing symptom resilience well. However, the cascades model should be adapted to include other areas of functioning, such as optimism and traumatic stress, in order to describe the resilience process for internalizing problems more holistically than previously proposed models for children in out-of-home care.

Anxiety model. While anxiety fit into the previously described cycle similar to a dual developmental cascades process, the majority of factors involved were related to depression, and indirectly related to anxiety through depression. When examining our

Study 1 anxiety model alone, and subsequent Study 2 reciprocal analyses, we observed very few factors related directly to anxiety in children in out-of-home care. The proposed model did not fit the anxiety data very well based on the limited number of significant factors observed in our studies. To date the majority of research in children in out-of-home care has focused on symptoms of traumatic stress (Courtney et al., 2013; Kaur & Kearney, 2013; Keller et al., 2010; Rosenberg et al., 2014), or internalizing problems as a single outcome (Bell et al., 2013; Heneghan et al., 2013; Legault et al., 2006; McWey, Acock, et al., 2010). Very little research exists examining other forms of anxiety, particularly longitudinally. This may be why very few predictors in the current studies were found to be significant, as support for inclusion of these factors into our model often came from depression research or research in community samples.

Further, none of the protective factors included in our model significantly predicted anxiety odds. However, there may be other protective factors not tested here that are more significantly related to anxiety symptoms in children in out-of-home care. In a community sample of 6085 Irish students, Dooley et al. (2015) found severity of anxiety was related to several positive internal factors including optimism, personal competence, life satisfaction, self-esteem, and body satisfaction. While optimism was not related to anxiety in our study, it may be useful to investigate other positive factors such as self-esteem, life satisfaction, and body satisfaction for children in out-of-home care. There is some support for these positive internal factors in out-of-home populations as well. Legault et al. (2006) found self-esteem was among the significant predictors of lower anxiety symptoms in a sample of 220 adolescents (14 to 17 years old) in out-of-home care in Canada. However, these studies were cross-sectional and the same predictors may not significantly predict anxiety over

time, or when other significant risk factors are included (such as depression, traumatic stress, and externalizing behaviours as in Study 1). Further investigation into a comprehensive resilience model for anxiety in children in out-of-home care could reveal relevant factors that might aid in the development of stronger prevention and intervention programs tailored to out-of-home populations.

Research Implications

The research implications from our studies include further investigation of the person-environment interaction from our model, and replication of our findings due to study limitations.

Person-environment interaction. Considering the complex nature of the resilience process suggested by our findings, the relationship between factors presented in the current research might have been non-significant due to the way in which these relationships were examined. The resilience framework outlined by Kumpfer (1999), and adapted to the outcomes of interest, suggest internal and environmental factors interact as part of the process of resilience. While this person-environment interaction was evaluated in a rather simplistic and indirect way in the current studies (i.e. by including all factors into a single model), a more complex approach may reveal that factors that were non-significant in our study do in fact play a significant role mediating or moderating the significant relationships that we did observe. For example, there may be indirect effects of school functioning and optimism on anxiety, fully mediated by depression. As we saw in Study 2, optimism and school functioning were associated with later depression odds, and depression was associated with later anxiety odds. Therefore, although school functioning and optimism did not display any direct effect on anxiety odds in Study 1, indirect effects

may still exist based on findings from Study 2. Leenarts et al. (2013) found that symptoms of PTSD mediated the relationship between early exposure to interpersonal trauma and mental health problems (including anxiety and depression), in a sample of 92 female adolescents (13 to 18 years old) from residential treatment centers in The Netherlands. Other such mediational relationships may exist within the factors of interest in the current studies.

Similarly, at level-2 (time-stable factors) we found gender, race, and maltreatment type to be significant factors in either the anxiety or depression models from Study 1. While we controlled for race, gender, and age effects in all Study 2 models, we did not examine gender or race differences in separate models in either study, or the possible unique effects of maltreatment type on the relationships under investigation. Examining these factors in separate models would have generated an unreasonable number of models for interpretation in the current study. However, future studies examining these factors in less complex models may reveal more detailed results by examining the relationships in separate models based on gender and race/ethnicity, as found in similar studies (Munson & McMillen, 2010; Orton, 2008; Tonmyr et al., 2011).

Replication. Considering the novelty and exploratory nature of the models and results presented from our studies, replication of our results is warranted. There were several limitations in our studies that could be addressed in future research. While our first study revealed anxiety ratings to be fairly stable over time in care, which is supported by some longitudinal research (McWey, Acock, et al., 2010), other studies show changes in anxiety over time in out-of-home care (Augenbraun, 2004; Lyons et al., 2001). This apparent stability in the current data would explain why few predictors were associated

with anxiety changes over time in Study 2. However, it is possible that our lack of findings reflects a limitation in the CANS as a psychometric measure of anxiety. While the CANS is sensitive to clinically relevant changes (Chor et al., 2012), with only four rating levels it does not have the sensitivity to detect more subtle changes in symptom severity over time. Since anxiety may be fairly stable over time in out-of-home care, the variability in scores from a more sensitive measure may be necessary to detect the subtle changes in anxiety that could be associated with the factors presented in our studies. As such, replication of our findings using a different measure of anxiety is warranted, although this may not be feasible in a large sample comparable to the one used in the current research.

Similarly, replication of both the anxiety and depression results may be warranted to address other limitations in our studies. As described in the study limitations, all analyses may have been influenced by common method variance due to the use of CANS items as both predictor and outcome variables. While the CANS is completed using multiple sources of information, and other methods were used in our studies in order to minimize potential common method variance (i.e. separating predictor and outcome in time), we cannot be assured this possible confounder was fully addressed. Replication of our studies using different measures for each construct could corroborate our results, however, as mentioned above, such a large-scale study may not be feasible due to time and financial constraints.

This research was also limited by the amount of missing placement type data. Modern imputation methods have been shown to reduce bias, thereby improving the reliability of the data (Bennett, 2001). Although a large amount of placement type data was missing from our sample, imputation of missing data was not possible due to the analysis

methods used in Study 2. The reliabilities for the placement type models in Study 2 were also quite low. The combination of missing data and poor reliabilities meant the results from the placement type models were unreliable. As such, replication of our findings using complete data, particularly for the placement type results, should be considered. Overall, because of the novelty and exploratory nature of the models presented and the unique findings in our studies, replication of this research is warranted.

Applied Implications

The applied implications from this research include more careful evaluation of anxiety problems for children in out-of-home care, and recommendations for improved intervention/prevention programs in this population.

Assessment of anxiety. To date, very little research has been done on anxiety problems in out-of-home populations, aside from traumatic stress. As such, as mentioned in Study 1, the adaptation of a resilience model to reflect internalizing outcomes in out-of-home populations was largely done using information from studies on depression or internalizing symptoms more generally in out-of-home populations, as well as information from community-based research on anxiety. Factors were then organized into a resilience framework (Kumpfer, 1999) based in part on available data. This may have been why so few predictors in Study 1 predicted anxiety odds, and subsequently why so few reciprocal relationships for anxiety were tested in Study 2, most of which were non-significant. While our findings may have been due in part to the limited range in scores on the CANS (and lack of detection in subtle changes in symptoms), it is also possible that, aside from traumatic stress, anxiety disorders are often undetected in children in out-of-home care. As described in Study 1, using the Strengths and Difficulties Questionnaire, Goodman et al. (2003) found

anxiety disorders were detected only 50.5% of the time in a community sample of 7,984 British children 5 to 15 years old. This rate is rather low considering the sensitivity of this measure in detecting externalizing problems (75.4% – 86.1% sensitivity) and depression (74.6% sensitivity) in the same sample. The detection rate in out-of-home samples may be even lower, since these children often exhibit symptoms of traumatic stress and more overt externalizing behaviours (McMillen et al., 2005), both of which might mask more subtle anxiety symptoms. Although the lifetime rate of “actionable” anxiety ratings were high in our sample, the overall mean in ratings indicated most children had no or low anxiety. It is possible that anxiety problems are not being accurately assessed in out-of-home populations. Our lack of findings may be an indication that more careful screening of anxiety disorders is necessary. When children receive a CANS anxiety rating of 1 (indicating low/suspected/history of anxiety), it may be worthwhile to administer a more detailed measure of anxiety symptomology or a brief clinical interview, in order to detect and address anxiety problems early on. However, with increased assessment procedures, there is also the issue of increased time and financial burden on the child welfare system, individuals involved in case planning, management, and service delivery, and the children and families being served.

Prevention/intervention programs. The current studies provide some insight into the resilience processes of depression and anxiety for children in out-of-home care. Taking the results of both studies into consideration, findings support a dual cascades model of resilience, with several additional areas of risk/protection. The complex relationships observed between depression, anxiety, externalizing behaviour, and school functioning over time suggest prevention and intervention programs taking into account

these areas may be more effective than programs that target any one area alone. In a review of therapeutic interventions for children in foster care, Craven and Lee (2006) found a lack of interventions addressing the unique experiences and needs of children in foster care. Out of 18 interventions reviewed, only six were exclusive to children in foster care, and overall the interventions did not address issues specific to children in foster care such as attachment, stigmatization, and foster family dynamics. One such treatment program was the Multidimensional Treatment Foster Care (MTFC) program mentioned earlier, which has more recently been evaluated within a resilience context (Leve et al., 2009). MTFC provides support and training at the child level in several areas, including strengths building, social and academic support, and behavioural interventions. However, there is little focus on internalizing interventions or outcomes specifically. In regards to internalizing problems, MTFC has only been evaluated regarding HPA axis functioning, but showed promise in this area. The resilient outcomes examined by Leve et al. (2009) included only school, social, and behavioural functioning. However, findings from Study 2 suggest internalizing problems, particularly depression, may be an integral component in the dual cascades model and should be considered in both the intervention targets and outcomes of interest. Further, MTFC requires children to be placed in foster care as several components involve support and education for foster parents. While foster family involvement is essential for children in those placements, considering only half of our sample were placed in foster, kinship, and treatment foster care, the development of similar interventions that can be provided to children regardless of placement may be of benefit for all children in out-of-home care placements. In addition, our findings suggest optimism and traumatic stress symptoms to be important components in the development

of depression, and targeting these areas in programs like MTFC may also improve depressive symptoms for children in out-of-home care.

Due to the limited findings in our anxiety models, it is more difficult to draw treatment implications specific to anxiety from this research. However, considering the high lifetime prevalence observed in our sample, integrating anxiety related content into the individual therapy component of MTFC may be useful in reducing anxiety for children in out-of-home care, while still addressing other relevant concerns like behaviour problems. Cognitive behaviour therapy has been shown to be an effective treatment for child and adolescent anxiety and depression in clinical samples (Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004; Compton et al., 2004), and has shown effectiveness as an anxiety prevention in community samples as well (Neil & Christensen, 2009). Further, trauma focused cognitive behaviour therapy has shown effectiveness in reducing symptoms of post-traumatic stress, depression, anxiety, and behaviour problems in youth exposed to traumatic events (Silverman et al., 2008). While the main goal in the individual therapy provided in MTFC focuses on identifying and building children's strengths, it also includes identifying and changing the negative behaviours and emotions children might experience (Leve et al., 2009). Therefore, adding some additional structure and content from trauma focused cognitive behaviour therapy to the therapy practices already in place should not be difficult and may improve functioning in other areas as well.

Conclusions

Internalizing problems are quite common in the general population and perhaps more frequent in child welfare involved samples. Anxiety and depression symptoms are also associated with problems in functioning in other areas. The current research explored

a novel adaptation of a comprehensive model for anxiety and depression in children in out-of-home care based on a resilience framework. Results from our studies suggest anxiety is fairly stable across time in out-of-home care and across age. Relatively few risk and protective factors were associated with anxiety outcomes outside of the common risk factors frequently researched (i.e. externalizing, traumatic stress, depression, maltreatment, placement). Depression tended to increase slightly with age but decrease slightly across time in care. Several risk and protective factors were associated with depression outcomes including both internal (optimism, traumatic stress, externalizing, anxiety) and external (family functioning, community involvement, school functioning, maltreatment, placement) factors. Overall models revealed few strength based predictors, and while some overlap in models was observed, results also showed unique models for each internalizing problem.

In examining the reciprocal relationships over time, simple resilience feedback mechanisms were largely not observed for either anxiety or depression. Only a few unidirectional relationships were observed involving anxiety (externalizing, depression, placement). For depression, several unidirectional (optimism, externalizing, school, placement) and two reciprocal relationships (traumatic stress, residential treatment care) were observed. Overall the relationships observed across time support a dual cascades model for depression and anxiety, with some additional factors to consider.

Our findings suggest more research is needed into the role of individual strengths in the resilience process of internalizing problems. And a more refined model for anxiety, distinct from that of depression, would be helpful in addressing the needs of children in out-of-home care. Of particular importance, findings suggest there may be a current deficiency in the detection and/or treatment of anxiety disorders in this vulnerable

population. Our results also provide support for certain intervention programs already being used in the child welfare system, and offer areas of potential improvement for future program development.

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Table 1. Descriptive statistics for all level-2 variables (N = 1,765)

		N	Percent
Gender:	Female	858	48.6
	Male	907	51.4
Race:	African American	986	55.9
	Caucasian	705	39.9
	Other/unknown	74	4.2
Hispanic origin:	No	1624	92.0
	Yes	119	6.7
	Unknown	22	1.2
Lifetime depression:	0 – no depression	565	32.0
	1 – history/mild depression	676	38.3
	2 – moderate depression	398	22.5
	3 – severe depression	126	7.1
Lifetime anxiety:	0 – no anxiety	544	30.8
	1 – history/mild anxiety	645	36.5
	2 – moderate anxiety	446	25.3
	3 – severe anxiety	130	7.4
		Mean	SD
Age at time of removal		10.67	2.95
Sexual abuse		0.55	0.92
Physical abuse		0.80	0.94
Emotional abuse		0.94	0.96
Neglect		1.33	1.00
Medical trauma		0.17	0.56
Family violence		0.81	0.97
School violence		0.17	0.47
Total trauma		5.36	4.42

Note. CANS trauma items range from 0 to 3, while total trauma is a cumulative measure of all trauma/maltreatment items with a maximum range of 0 to 36.

Table 2. Descriptive statistics for all level-1 variables (N = 7,979 total assessments)

	Grand Mean	SD
Age	14.44	3.82
Time in care (months)	58.76	39.37
Number of assessments	4.52	1.78
Depression	0.74	0.70
Anxiety	0.80	0.73
Talents/interests	1.05	0.81
Optimism	1.08	0.80
Traumatic stress	0.52	0.50
Spirituality	1.68	1.01
Health	0.41	0.63
Recreation	0.33	0.53
Externalizing	0.81	0.69
Substance use	0.25	0.52
Family functioning	1.28	0.62
Acculturation	0.07	0.20
Community	1.34	0.87
Living situation	0.88	0.72
School functioning	0.75	0.60
Social functioning	1.07	0.59
Placement type	N	Percent
Kinship care/trial visit home	891	11.17
Foster care	1828	22.91
Treatment foster care	1575	19.74
Residential care	1007	12.62
Residential treatment center	203	2.54
Institution	251	3.15
Other/unknown	1375	17.23
Missing	849	10.64

Note. CANS items and computed subscales have a maximum range of 0 to 3.

Table 3. Correlation matrix between level-1 variables.

Variable	1	2	3	4	5	6	7	8	(continued)
1. Anxiety	-								
2. Depression	.601***	-							
3. Age	.028*	.184***	-						
4. Time in care	-.003	.026*	.672***	-					
5. Talents/interests	.210***	.192***	.013	.007	-				
6. Optimism	.267***	.304***	.038**	.011	.582***	-			
7. Traumatic stress	.536***	.532***	.013	-.029**	.160***	.255***	-		
8. Spirituality	.098***	.113***	.072***	.017	.391***	.383***	.077***	-	
9. Health	.148***	.138***	.041***	.055***	.170***	.146***	.159***	.049***	
10. Recreation	.225***	.265***	.080***	.023*	.207***	.219***	.254***	.118***	
11. Externalizing	.510***	.496***	.072***	.029*	.286***	.357***	.476***	.157***	
12. Substance use	.143***	.238***	.293***	.129***	.142***	.146***	.187***	.117***	
13. Family	.308***	.355***	-.017	-.101***	.228***	.329***	.386***	.213***	
14. Acculturation	.112***	.116***	-.013	-.043***	.098***	.083***	.155***	.003	
15. Community	.217***	.236***	.020	-.018	.508***	.499***	.204***	.566***	
16. Living situation	.336***	.345***	-.026*	-.074***	.184***	.256***	.381***	.124***	
17. School	.284***	.350***	.162***	.073***	.308***	.355***	.320***	.235***	
18. Social	.417***	.424***	.043***	-.019	.524***	.628***	.414***	.371***	
19. Kinship care	-.063***	-.078***	-.053***	.020	-.026*	-.035**	-.079***	.015	
20. Treatment foster care	-.023	-.014	.019	.044***	.009	-.011	-.007	.018	
21. Residential care	.087***	.080***	.144***	.036**	.062***	.095***	.044***	.031**	
22. Residential treatment center	.116***	.132***	.042***	-.051***	.065***	.054***	.067***	.058***	
23. Institution	.050***	.098***	.037**	-.035**	.047***	.023	.078***	.024*	
24. Other/ unknown	-.009	-.016	.010	.060***	-.009	<.001	-.024*	-.014	

* $p < .05$, ** $p < .01$, *** $p < .001$, all tests are two-tailed.

Table 3 (continued).

Variable	9	10	11	12	13	14	15	16	(continued)
1. Anxiety									
2. Depression									
3. Age									
4. Time in care									
5. Talents/interests									
6. Optimism									
7. Traumatic stress									
8. Spirituality									
9. Health	-								
10. Recreation	.297***	-							
11. Externalizing	.204***	.315***	-						
12. Substance use	.046***	.172***	.268***	-					
13. Family	.087***	.180***	.321***	.158***	-				
14. Acculturation	.222***	.203***	.088***	.054***	.134***	-			
15. Community	.084***	.206***	.300***	.148***	.331***	.056***	-		
16. Living situation	.184***	.238***	.432***	.206***	.435***	.115***	.255***	-	
17. School	.161***	.262***	.512***	.370***	.326***	.086***	.331***	.403***	
18. Social	.214***	.349***	.558***	.197***	.548***	.114***	.610***	.461***	
19. Kinship care	-.030*	-.039**	-.085***	.006	-.064***	-.028*	-.028*	-.028*	
20. Treatment foster care	-.012	-.029*	-.031**	-.064***	-.027*	-.017	-.012	-.081***	
21. Residential care	.143***	.086***	.181***	.019	.008	.016	.070***	.043***	
22. Residential treatment center	.017	.054***	.117***	.070***	.059***	.012	.077***	.087***	
23. Institution	.061***	.107***	.081***	.080***	.027*	.019	.042***	.062***	
24. Other/unknown	-.030*	-.030*	-.053***	.027*	.014	.037**	-.001	.005	

* $p < .05$, ** $p < .01$, *** $p < .001$, all tests are two-tailed.

Table 3 (continued).

Variable	17	18	19	20	21	22	23
1. Anxiety							
2. Depression							
3. Age							
4. Time in care							
5. Talents/interests							
6. Optimism							
7. Traumatic stress							
8. Spirituality							
9. Health							
10. Recreation							
11. Externalizing							
12. Substance use							
13. Family							
14. Acculturation							
15. Community							
16. Living situation							
17. School	-						
18. Social	.490***	-					
19. Kinship care	-.022	-.080***	-				
20. Treatment foster care	-.043***	-.024*	-.201***	-			
21. Residential care	.075***	.135***	-.153***	-.216***	-		
22. Residential treatment center	.066***	.088***	-.065***	-.091***	-.069***	-	
23. Institution	.075***	.046***	-.072***	-.102***	-.077***	-.033**	-
24. Other/unknown	.011	-.008	-.185***	-.260***	-.198***	-.084***	-.093***

* $p < .05$, ** $p < .01$, *** $p < .001$, all tests are two-tailed.

Table 4. Correlation matrix between mean anxiety, mean depression, and all level-2 variables.

Variable	1	2	3	4	5	6	7	(continued)
1. Mean anxiety	-							
2. Mean depression	.621***	-						
3. Gender	-.017	-.092***	-					
4. Race - Caucasian	.118***	.004	.025	-				
5. Race - other	-.002	-.009	-.045	-.171***	-			
6. Hispanic origin - yes	.005	-.003	-.046	.094***	.372***	-		
7. Hispanic origin - unknown	-.017	-.022	.017	-.029	.104***	-.030	-	
8. Sexual abuse	.252***	.256***	-.154***	.066**	.016	.075**	-.034	
9. Physical abuse	.259***	.238***	-.003	-.010	.078**	.046	-.014	
10. Emotional abuse	.330***	.310***	-.030	.071**	.057*	.035	-.030	
11. Neglect	.207***	.165***	-.001	.194***	.039	.048*	.009	
12. Medical trauma	.065**	.035	.046	.009	.029	< .001	.021	
13. Family violence	.206***	.154***	.015	.139***	.050*	.077**	-.015	
14. School violence	.197***	.244***	.047*	-.112***	-.040	-.055*	-.030	
15. Total trauma	.350***	.331***	-.007	.096***	.042	.052*	-.025	

* $p < .05$, ** $p < .01$, *** $p < .001$, all tests are two-tailed.

Table 4 (continued).

Variable	8	9	10	11	12	13	14
1. Mean anxiety							
2. Mean depression							
3. Gender							
4. Race - Caucasian							
5. Race - other							
6. Hispanic origin - yes							
7. Hispanic origin - unknown							
8. Sexual abuse	-						
9. Physical abuse	.330***	-					
10. Emotional abuse	.343***	.660***	-				
11. Neglect	.192***	.375***	.534***	-			
12. Medical trauma	.068**	.115***	.145***	.176***	-		
13. Family violence	.211***	.462***	.500***	.427***	.111***	-	
14. School violence	.148***	.187***	.234***	.147***	.112***	.221***	-
15. Total trauma	.515***	.713***	.787***	.674***	.314***	.727***	.443***

* $p < .05$, ** $p < .01$, *** $p < .001$, all tests are two-tailed.

Table 5. Parameter estimates for anxiety odds across time in care and age.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.342	(0.270, 0.435)	-1.072	0.122	< .001
Time slope, β_{10}	1.002	(0.997, 1.008)	0.002	0.003	.415
Age slope, β_{20}	0.990	(0.936, 1.047)	-0.010	0.029	.719
Age ² slope, β_{30}	1.021	(1.013, 1.030)	0.021	0.004	< .001
Threshold 2, δ_1	39.728	(33.879, 46.586)	3.682	0.081	< .001
Threshold 3, δ_2	1,226.301	(905.660, 1,660.464)	7.112	0.155	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.727	7.436	1727	4663.059	< .001
Time slope, r_1	0.046	0.002	1727	2302.465	< .001

Table 6. Parameter estimates for the final model predicting anxiety odds.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	p-value
Fixed Effects					
Intercept, β_{00}	0.582	(0.390, 0.867)	-0.542	0.204	.008
Gender, β_{01}	1.056	(0.754, 1.479)	0.055	0.172	.750
Sexual abuse, β_{02}	0.628	(0.475, 0.832)	-0.465	0.143	.001
Physical abuse, β_{03}	0.840	(0.625, 1.128)	-0.174	0.150	.246
Emotional abuse, β_{04}	0.525	(0.376, 0.733)	-0.644	0.170	< .001
Neglect, β_{05}	0.871	(0.648, 1.172)	-0.138	0.151	.362
Medical trauma, β_{06}	1.078	(0.710, 1.636)	-0.075	0.213	.724
Family violence, β_{07}	1.035	(0.742, 1.444)	-0.035	0.169	.838
School violence, β_{08}	0.459	(0.277, 0.761)	-0.778	0.257	.003
Total trauma, β_{09}	0.970	(0.810, 1.161)	-0.030	0.092	.740
Race: Caucasian, β_{010}	0.382	(0.265, 0.551)	-0.962	0.187	< .001
Race: other, β_{011}	0.642	(0.227, 1.818)	-0.443	0.531	.404
Hispanic origin, β_{012}	1.652	(0.750, 3.641)	0.502	0.401	.212
Hispanic origin unknown, β_{013}	0.667	(0.153, 2.914)	-0.405	0.752	.590
Time slope, β_{10}	0.997	(0.991, 1.003)	-0.003	0.003	.315
Age slope, β_{20}	0.982	(0.920, 1.049)	-0.018	0.034	.589
Age ² slope, β_{30}	1.010	(1.001, 1.020)	0.010	0.005	.025
Living situation, β_{40}	0.975	(0.849, 1.120)	-0.025	0.071	.719
Health slope, β_{50}	1.050	(0.867, 1.271)	0.048	0.098	.620
Recreation slope, β_{60}	1.068	(0.842, 1.356)	0.066	0.118	.587
Depression slope, β_{70}	0.178	(0.142, 0.225)	-1.724	0.118	< .001
Substance use slope, β_{80}	0.793	(0.621, 1.013)	-0.232	0.125	.064
Spirituality slope, β_{90}	1.119	(0.988, 1.266)	0.112	0.063	.076
(continued)					

Table 6 (continued).

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Community slope, β_{100}	1.104	(0.935, 1.303)	0.099	0.085	.244
Optimism slope, β_{110}	0.853	(0.697, 1.044)	-0.159	0.103	.123
Talents/interest slope, β_{120}	0.862	(0.730, 1.017)	-0.149	0.085	.078
Family slope, β_{130}	0.995	(0.813, 1.216)	-0.005	0.103	.958
Acculturation Slope, β_{140}	1.071	(0.590, 1.946)	0.069	0.305	.821
Externalizing slope, β_{150}	0.325	(0.245, 0.431)	-1.124	0.145	< .001
Traumatic stress slope, β_{160}	0.372	(0.274, 0.504)	-0.989	0.155	< .001
School slope, β_{170}	0.998	(0.813, 1.225)	-0.002	0.104	.984
Social slope, β_{180}	0.844	(0.589, 1.211)	-0.169	0.184	.358
Kinship care slope, β_{190}	0.786	(0.550, 1.124)	-0.241	0.182	.187
Tx foster care slope, β_{200}	0.651	(0.464, 0.913)	-0.429	0.173	.013
Residential slope, β_{210}	0.402	(0.266, 0.607)	-0.912	0.211	< .001
Residential tx slope, β_{220}	0.204	(0.115, 0.362)	-1.591	0.294	< .001
Institution slope, β_{230}	0.343	(0.173, 0.680)	-1.071	0.350	.002
Other placement slope, β_{240}	0.690	(0.494, 0.963)	-0.371	0.170	.029
Threshold 2, δ_1	83.677	(69.333, 100.987)	4.427	0.096	< .001
Threshold 3, δ_2	7,753.841	(5,386.682, 11,161.240)	8.956	0.186	< .001
	Standard Deviation	Variance	<i>d.f.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	3.086	9.521	699	5206.160	< .001
Depression slope, r_6	1.530	2.340	712	1033.196	< .001

Table 7. Parameter estimates for depression odds across time in care and age.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.532	(0.427, 0.663)	-0.631	0.112	< .001
Time slope, β_{10}	1.017	(1.011, 1.022)	0.017	0.003	< .001
Age slope, β_{20}	0.801	(0.760, 0.843)	-0.222	0.026	< .001
Age ² slope, β_{20}	1.025	(1.017, 1.033)	0.025	0.004	< .001
Threshold 2, δ_1	38.868	(33.230, 45.461)	3.660	0.080	< .001
Threshold 3, δ_2	840.986	(625.974, 1,129.851)	6.734	0.151	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.424	5.878	1727	4166.398	< .001
Time slope, r_1	0.040	0.002	1727	2107.609	< .001

Table 8. Parameter estimates for the final model predicting depression odds.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	p-value
Fixed Effects					
Intercept, β_{00}	0.475	(0.324, 0.696)	-0.744	0.195	< .001
Gender, β_{01}	1.711	(1.239, 2.361)	0.537	0.165	.001
Sexual abuse, β_{02}	0.837	(0.637, 1.101)	-0.177	0.139	.203
Physical abuse, β_{03}	1.094	(0.802, 1.493)	0.090	0.158	.569
Emotional abuse, β_{04}	0.709	(0.519, 0.968)	-0.344	0.159	.031
Neglect, β_{05}	1.040	(0.770, 1.403)	0.039	0.153	.798
Medical trauma, β_{06}	1.540	(1.066, 2.226)	0.432	0.188	.022
Family violence, β_{07}	1.517	(1.094, 1.104)	0.417	0.167	.013
School violence, β_{08}	0.702	(0.411, 1.199)	-0.353	0.273	.195
Total trauma, β_{09}	0.765	(0.635, 0.922)	-0.267	0.095	.005
Race: Caucasian, β_{10}	0.800	(0.563, 1.136)	-0.224	0.179	.212
Race: other, β_{11}	0.696	(0.299, 1.620)	-0.363	0.431	.400
Hispanic, β_{12}	1.246	(0.611, 2.537)	0.220	0.363	.545
Hispanic unknown, β_{13}	0.398	(0.090, 1.763)	-0.922	0.759	.225
Time slope, β_{10}	1.014	(1.008, 1.020)	0.014	0.003	< .001
Age slope, β_{20}	0.766	(0.720, 0.816)	-0.266	0.032	< .001
Age ² slope, β_{30}	1.016	(1.007, 1.025)	0.016	0.005	< .001
Living situation slope, β_{40}	0.906	(0.790, 1.039)	-0.099	0.070	.156
Health slope, β_{50}	0.963	(0.799, 1.160)	-0.038	0.095	.692
Recreation slope, β_{60}	0.975	(0.790, 1.203)	-0.026	0.107	.812
Anxiety slope, β_{70}	0.180	(0.143, 0.226)	-1.717	0.118	< .001
Substance use slope, β_{80}	0.897	(0.725, 1.111)	-0.108	0.109	.320
Spirituality slope, β_{90}	0.946	(0.829, 1.080)	-0.055	0.067	.412
(continued)					

Table 8 (continued).

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Community slope, β_{100}	0.826	(0.698, 0.977)	-0.192	0.086	.025
Optimism slope, β_{110}	0.780	(0.646, 0.940)	-0.249	0.096	.009
Talents slope, β_{120}	1.084	(0.918, 1.281)	0.081	0.085	.339
Family slope, β_{130}	0.735	(0.607, 0.889)	-0.309	0.098	.002
Acculturation slope, β_{140}	0.895	(0.506, 1.581)	-0.111	0.291	.702
Externalizing slope, β_{150}	0.434	(0.323, 0.583)	-0.835	0.150	< .001
Traumatic stress slope, β_{160}	0.348	(0.243, 0.500)	-1.054	0.184	< .001
School slope, β_{170}	0.820	(0.677, 0.992)	-0.199	0.097	.041
Social slope, β_{180}	0.921	(0.669, 1.269)	-0.082	0.163	.616
Kinship care slope, β_{190}	0.850	(0.583, 1.239)	-0.163	0.192	.398
Tx foster care slope, β_{200}	0.740	(0.527, 1.039)	-0.302	0.173	.082
Residential slope, β_{210}	0.659	(0.445, 0.976)	-0.417	0.200	.037
Residential tx slope, β_{220}	0.184	(0.098, 0.347)	-1.692	0.324	< .001
Institution slope, β_{230}	0.253	(0.142, 0.450)	-1.376	0.294	< .001
Other placement slope, β_{240}	0.849	(0.611, 1.182)	-0.163	0.168	.333
Threshold 2, δ_1	98.302	(80.907, 119.436)	4.588	0.099	< .001
Threshold 3, δ_2	6,076.490	(4,253.869, 8,680.035)	8.712	0.182	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.897	8.391	677	4297.187	< .001
Anxiety slope, r_6	1.322	1.748	690	897.419	< .001

Table 9. Parameter estimates for anxiety odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.423	(0.290, 0.615)	-0.861	0.192	< .001
Gender, β_{01}	1.095	(0.806, 1.487)	0.090	0.156	.563
Race:	0.429	(0.310, 1.487)	-0.847	0.165	< .001
Caucasian, β_{02}					
Race: other, β_{03}	0.637	(0.257, 1.577)	-0.451	0.462	.329
Hispanic, β_{04}	1.361	(0.665, 2.786)	0.308	0.365	.399
Hispanic unknown, β_{05}	1.229	(0.310, 4.870)	0.206	0.702	.769
Time slope, β_{10}	1.001	(0.995, 1.007)	0.001	0.003	.769
LAG time slope, β_{20}	0.994	(0.982, 1.006)	-0.006	0.006	.306
Age slope, β_{30}	0.980	(0.926, 1.037)	-0.020	0.029	.486
Age ² slope, β_{40}	1.017	(1.008, 1.026)	0.017	0.005	< .001
LAG anxiety slope, β_{50}	0.461	(0.389, 0.546)	-0.774	0.086	< .001
Threshold 2, δ_1	45.026	(38.080, 53.239)	3.807	0.085	< .001
Threshold 3, δ_2	1,562.893	(1,130.068, 2,161.493)	7.354	0.165	< .001
	Standard Deviation	Variance	<i>d.f.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.915	8.500	1759	10,575.878	< .001

Table 10. Parameter estimates for depression odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.252	(0.180, 0.352)	-1.379	0.171	< .001
Gender, β_{01}	1.505	(1.138, 1.990)	0.409	0.142	.004
Race:	0.760	(0.563, 1.025)	-0.275	0.153	.072
Caucasian, β_{02}					
Race: other, β_{03}	0.631	(0.316, 1.257)	-0.461	0.352	.190
Hispanic, β_{04}	1.171	(0.666, 2.060)	0.158	0.288	.583
Hispanic unknown, β_{05}	0.818	(0.222, 3.006)	-0.201	0.664	.762
Time slope, β_{10}	1.012	(1.007, 1.017)	0.012	0.003	< .001
LAG time slope, β_{20}	0.991	(0.981, 1.002)	-0.009	0.005	.103
Age slope, β_{30}	0.800	(1.760, 0.843)	-0.223	0.027	< .001
Age ² slope, β_{40}	1.019	(1.011, 1.028)	0.019	0.004	< .001
LAG depression slope, β_{50}	0.521	(0.445, 0.609)	-0.653	0.080	< .001
Threshold 2, δ_1	39.928	(33.837, 47.117)	3.687	0.084	< .001
Threshold 3, δ_2	927.520	(662.715, 1298.136)	6.833	0.172	< .001
	Standard Deviation	Variance	<i>d.f.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.584	6.676	1759	9,064.063	< .001

Table 11. Parameter estimates for the traumatic stress model including all control variables.

	Coefficient	Standard Error	<i>df.</i>	<i>t</i> -ratio	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.594	0.032	1759	18.804	< .001
Gender, β_{01}	-0.011	0.026	1759	-0.440	.660
Race:	0.050	0.028	1759	1.796	.073
Caucasian, β_{02}					
Race: other,	0.040	0.059	1759	0.685	.493
β_{03}					
Hispanic, β_{04}	-0.029	0.054	1759	-0.528	.598
Hispanic	-0.185	0.088	1759	-2.114	.035
unknown, β_{05}					
Time slope, β_{10}	-0.001	< 0.001	1764	-2.566	.010
LAG time slope,	0.0001	0.001	2643	0.097	.923
β_{20}					
Age slope, β_{30}	0.007	0.005	2643	1.545	.122
Age ² slope, β_{40}	-0.002	0.001	2643	-2.583	.010
LAG traumatic	0.110	0.024	2643	4.540	< .001
stress slope, β_{50}					
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	0.648	0.420	1389	5,101.747	< .001
Time slope, r_0	0.009	< 0.001	1394	3,197.538	< .001
Error, e	0.231	0.053			

Table 12. Parameter estimates for the externalizing model including all control variables.

	Coefficient	Standard Error	<i>df.</i>	<i>t</i> -ratio	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.789	0.039	1759	20.029	< .001
Gender, β_{01}	0.264	0.032	1759	8.172	< .001
Race:	-0.021	0.035	1759	-0.605	.545
Caucasian, β_{02}					
Race: other,	-0.151	0.076	1759	-1.988	.047
β_{03}					
Hispanic, β_{04}	-0.112	0.066	1759	-1.708	.088
Hispanic	-0.060	0.158	1759	-0.377	.706
unknown, β_{05}					
Time slope, β_{10}	-0.001	0.001	4404	-1.026	.305
LAG time slope,	-0.0001	0.001	4404	-0.070	.944
β_{20}					
Age slope, β_{30}	0.009	0.006	4404	1.464	.143
Age ² slope, β_{40}	-0.005	0.001	4404	-5.542	< .001
LAG external	0.203	0.026	4404	7.881	< .001
slope, β_{50}					
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	0.646	0.417	1759	23,647.537	< .001
Error, e	0.340	0.116			

Table 13. Parameter estimates for optimism odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.233	(0.163, 0.333)	-1.456	0.182	< .001
Gender, β_{01}	0.626	(0.470, 0.833)	-0.469	0.146	.001
Race:	0.885	(0.652, 1.202)	-0.122	0.156	.434
Caucasian, β_{02}					
Race: other, β_{03}	1.224	(0.579, 2.589)	0.202	0.382	.596
Hispanic, β_{04}	1.633	(0.844, 3.159)	0.491	0.336	.145
Hispanic unknown, β_{05}	1.245	(0.373, 4.161)	0.219	0.615	.721
Time slope, β_{10}	1.004	(0.999, 1.009)	0.004	0.003	.114
LAG time slope, β_{20}	0.992	(0.981, 1.003)	-0.008	0.006	.158
Age slope, β_{30}	0.979	(0.929, 1.031)	-0.022	0.026	.411
LAG optimism slope, β_{40}	0.592	(0.514, 0.681)	-0.525	0.072	< .001
Threshold 2, δ_1	27.653	(23.725, 32.230)	3.320	0.078	< .001
Threshold 3, δ_2	506.464	(394.965, 649.439)	6.227	0.127	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.762	7.631	1759	10,210.811	< .001

Table 14. Parameter estimates for the family functioning model including all control variables.

	Coefficient	Standard Error	<i>df.</i>	<i>t</i> -ratio	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	1.383	0.039	1759	35.151	< .001
Gender, β_{01}	-0.030	0.031	1759	-0.979	.328
Race:	0.045	0.033	1759	1.332	.183
Caucasian, β_{02}					
Race: other,	0.004	0.090	1759	0.046	.963
β_{03}					
Hispanic, β_{04}	0.062	0.072	1759	0.860	.390
Hispanic	-0.207	0.173	1759	-1.196	.232
unknown, β_{05}					
Time slope, β_{10}	-0.003	0.001	4425	-5.481	< .001
LAG time slope,	0.002	0.001	4425	1.154	.249
β_{20}					
Age slope, β_{30}	0.014	0.005	4425	2.536	.011
LAG family	0.162	0.024	4425	6.795	< .001
slope, β_{40}					
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	0.600	0.360	1759	14,034.402	< .001
Error, e	0.425	0.180			

Table 15. Parameter estimates for community involvement odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.104	(0.074, 0.148)	-2.260	0.177	< .001
Gender, β_{01}	0.695	(0.529, 0.913)	-0.364	0.139	.009
Race:	0.949	(0.711, 1.266)	-0.053	0.147	.721
Caucasian, β_{02}					
Race: other, β_{03}	1.391	(0.618, 3.133)	0.330	0.414	.425
Hispanic, β_{04}	1.325	(0.729, 2.408)	0.282	0.304	.355
Hispanic unknown, β_{05}	0.479	(0.131, 1.752)	-0.735	0.661	.266
Time slope, β_{10}	1.006	(1.001, 1.011)	0.006	0.002	.013
LAG time slope, β_{20}	0.998	(0.987, 1.009)	-0.002	0.006	.735
Age slope, β_{30}	0.950	(0.905, 0.998)	-0.051	0.025	.042
LAG community slope, β_{40}	0.575	(0.510, 0.649)	-0.553	0.061	< .001
Threshold 2, δ_1	20.115	(17.298, 23.390)	3.001	0.077	< .001
Threshold 3, δ_2	218.568	(176.394, 270.826)	5.387	0.109	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.626	6.898	1759	9,690.034	< .001

Table 16. Parameter estimates for the school functioning model including all control variables.

	Coefficient	Standard Error	<i>df.</i>	<i>t</i> -ratio	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.790	0.037	1759	21.308	< .001
Gender, β_{01}	0.086	0.029	1759	2.929	.003
Race:	-0.104	0.030	1759	-3.433	< .001
Caucasian, β_{02}					
Race: other,	-0.128	0.064	1759	-1.991	.047
β_{03}					
Hispanic, β_{04}	-0.060	0.047	1759	-1.268	.205
Hispanic	-0.056	0.124	1759	-0.447	.655
unknown, β_{05}					
Time slope, β_{10}	-0.001	0.001	4421	-2.214	.027
LAG time slope,	-0.00003	0.001	4421	-0.029	.997
β_{20}					
Age slope, β_{30}	0.037	0.005	4421	7.412	< .001
LAG school	0.151	0.022	4421	6.791	< .001
slope, β_{40}					
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	0.562	0.316	1759	13,113.033	< .001
Error, e	0.404	0.163			

Table 17. Parameter estimates for kinship care odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.005	(0.003,0.009)	-5.342	0.320	< .001
Gender, β_{01}	0.775	(0.515,1.168)	-0.255	0.209	.223
Race:	1.620	(1.012,2.593)	0.482	0.240	.044
Caucasian, β_{02}					
Race: other, β_{03}	2.207	(0.740,6.578)	0.792	0.557	.155
Hispanic, β_{04}	1.309	(0.591,2.897)	0.269	0.405	.506
Hispanic unknown, β_{05}	0.701	(0.062,7.927)	-0.356	1.237	.774
Time slope, β_{10}	1.010	(0.999,1.022)	0.010	0.006	.077
LAG time slope, β_{20}	1.027	(0.982,1.075)	0.027	0.023	.243
Age slope, β_{30}	0.788	(0.687,0.905)	-0.238	0.070	< .001
Age ² slope, β_{40}	0.952	(0.922,0.983)	-0.049	0.016	.003
LAG kinship slope, β_{50}	2,790.966	(1721.991,4523.539)	7.934	0.246	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.649	7.020	102	4,297.990	< .001
LAG kinship slope, r_5	3.836	14.713	107	908.029	< .001
Error, e	0.375	0.140			

Table 18. Parameter estimates for foster care odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.025	(0.011, 0.053)	-3.708	0.393	< .001
Gender, β_{01}	0.646	(0.389, 1.070)	-0.438	0.258	.090
Race:	0.621	(0.357, 1.081)	-0.476	0.282	.092
Caucasian, β_{02}					
Race: other, β_{03}	0.337	(0.107, 1.063)	-1.087	0.585	.063
Hispanic, β_{04}	1.244	(0.459, 3.370)	0.218	0.508	.667
Hispanic unknown, β_{05}	0.511	(0.087, 3.010)	-0.672	0.904	.458
Time slope, β_{10}	0.962	(0.944, 0.981)	-0.039	0.010	< .001
LAG time slope, β_{20}	0.971	(0.931, 1.012)	-0.030	0.022	.165
Age slope, β_{30}	0.775	(0.669, 0.898)	-0.254	0.075	< .001
Age ² slope, β_{40}	0.965	(0.940, 0.991)	-0.035	0.014	.009
LAG foster care slope, β_{50}	8,945.330	(2,864.714, 27,932.608)	9.099	0.581	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	3.131	9.804	1613	8,962.952	< .001
Error, e	0.441	0.195			

Table 19. Parameter estimates for treatment foster care odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.003	(0.002, 0.007)	-5.748	0.367	< .001
Gender, β_{01}	0.845	(0.554, 1.290)	-0.168	0.216	.435
Race:	0.568	(0.344, 0.936)	-0.566	0.255	.026
Caucasian, β_{02}					
Race: other, β_{03}	0.420	(0.124, 1.415)	-0.869	0.620	.161
Hispanic, β_{04}	1.118	(0.380, 3.288)	0.112	0.550	.839
Hispanic unknown, β_{05}	16.098	(3.515, 73.732)	2.779	0.776	< .001
Time slope, β_{10}	1.021	(1.010, 1.033)	0.021	0.006	< .001
LAG time slope, β_{20}	1.060	(1.016, 1.106)	0.058	0.022	.008
Age slope, β_{30}	0.896	(0.798, 1.007)	-0.109	0.060	.066
Age ² slope, β_{40}	0.965	(0.936, 0.995)	-0.036	0.016	.021
LAG treatment foster slope, β_{50}	10,345.723	(6,957.516, 15,383.939)	9.244	0.202	< .001
	Standard Deviation	Variance	<i>d.f.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.946	8.679	128	7,218.948	< .001
LAG treatment foster slope, r_5	4.004	16.029	133	591.654	< .001
Error, e	0.356	0.126			

Table 20. Parameter estimates for residential care odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.005	(0.002, 0.010)	-5.347	0.394	< .001
Gender, β_{01}	1.769	(1.090, 2.869)	0.570	0.247	.021
Race:	0.939	(0.561, 1.571)	-0.063	0.262	.809
Caucasian, β_{02}					
Race: other, β_{03}	1.714	(0.497, 6.125)	0.539	0.649	.407
Hispanic, β_{04}	0.300	(0.112, 0.804)	-1.205	0.503	.017
Hispanic unknown, β_{05}	0.067	(0.023, 0.196)	-2.705	0.547	< .001
Time slope, β_{10}	1.009	(0.998, 1.019)	0.009	0.005	.107
LAG time slope, β_{20}	0.992	(0.949, 1.036)	-0.008	0.023	.709
Age slope, β_{30}	1.060	(0.876, 1.283)	0.059	0.097	.547
Age ² slope, β_{40}	0.881	(0.829, 0.937)	-0.127	0.031	< .001
LAG residential care slope, β_{50}	3,245.464	(896.199, 11,753.009)	8.085	0.657	< .001
	Standard Deviation	Variance	<i>d.f.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.571	6.613	1613	9,160.953	< .001
Error, e	0.350	0.122			

Table 21. Parameter estimates for residential treatment odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.001	(<0.001, 0.009)	-6.577	0.978	< .001
Gender, β_{01}	3.192	(1.409, 7.232)	1.161	0.417	.005
Race: Caucasian, β_{02}	2.381	(0.885, 6.406)	0.868	0.504	.086
Race: other, β_{03}	2.518	(0.265, 23.961)	0.923	1.148	.421
Hispanic, β_{04}	0.301	(0.061, 1.477)	-1.200	0.810	.139
Time slope, β_{10}	0.999	(0.972, 1.026)	-0.001	0.014	.921
LAG time slope, β_{20}	0.854	(0.726, 1.004)	-0.158	0.083	.056
Age slope, β_{30}	1.450	(0.690, 3.048)	0.372	0.379	.327
Age ² slope, β_{40}	0.718	(0.578, 0.891)	-0.332	0.111	.003
LAG residential treatment slope, β_{50}	470.089	(7.271, 30,392.524)	6.153	2.127	.004
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	4.129	17.046	1613	35,592.177	< .001
Error, e	0.164	0.027			

Table 22. Parameter estimates for institutional care odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.0002	(<0.001, 0.001)	-8.713	1.101	< .001
Gender, β_{01}	2.443	(1.288, 4.634)	0.893	0.326	.006
Race: Caucasian, β_{02}	1.244	(0.562, 2.760)	0.219	0.406	.589
Race: other, β_{03}	1.116	(0.163, 7.639)	0.109	0.981	.911
Hispanic, β_{04}	1.015	(0.217, 4.740)	0.015	0.785	.985
Time slope, β_{10}	0.983	(0.952, 1.015)	-0.017	0.016	.301
LAG time slope, β_{20}	1.072	(1.003, 1.146)	0.070	0.034	.040
Age slope, β_{30}	1.337	(1.104, 1.619)	0.290	0.098	.003
Age ² slope, β_{40}	1.035	(0.958, 1.119)	0.035	0.040	.382
LAG institution slope, β_{50}	2,081.956	(4.638, 934,619.017)	7.641	3.116	.014
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.631	6.923	1614	16,753.312	< .001
Error, e	0.214	0.046			

Table 23. Parameter estimates for other/unknown placement odds including all control variables.

	Odds Ratio	95% Confidence Interval	Coefficient	Standard Error	<i>p</i> -value
Fixed Effects					
Intercept, β_{00}	0.002	(0.001, 0.005)	-6.044	0.362	< .001
Gender, β_{01}	0.938	(0.642, 1.373)	-0.064	0.194	.743
Race: Caucasian, β_{02}	1.110	(0.730, 1.690)	0.105	0.214	.625
Race: other, β_{03}	1.669	(0.647, 4.308)	0.512	0.483	.290
Hispanic, β_{04}	1.056	(0.459, 2.430)	0.055	0.425	.898
Hispanic unknown, β_{05}	0.282	(0.054, 1.467)	-1.267	0.841	.132
Time slope, β_{10}	0.992	(0.984, 1.001)	-0.008	0.004	.074
LAG time slope, β_{20}	0.984	(0.952, 1.016)	-0.016	0.017	.326
Age slope, β_{30}	1.459	(1.325, 1.607)	0.378	0.049	< .001
Age ² slope, β_{40}	1.096	(1.074, 1.119)	0.092	0.011	< .001
LAG other placement slope, β_{50}	2,042.063	(986.676, 4,226.331)	7.622	0.371	< .001
	Standard Deviation	Variance	<i>df.</i>	χ^2	<i>p</i> -value
Random Effects					
Intercept, r_0	2.397	5.747	1613	5,964.814	< .001
Error, e	0.511	0.261			

Figure 1. Proposed theoretical resilience model for internalizing symptoms adapted from Kumpfer (1999).

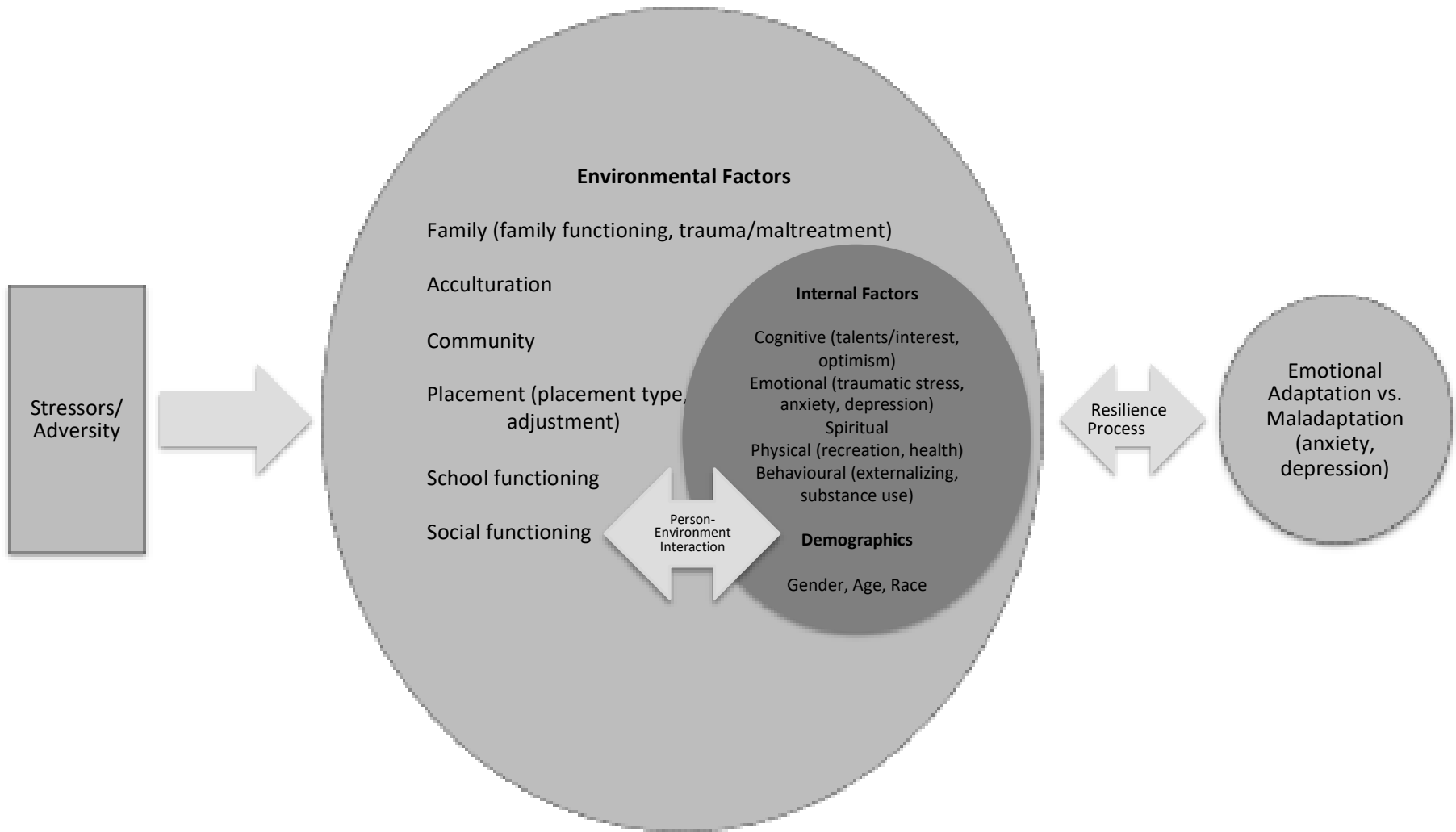


Figure 2. Mean CANS anxiety (a) and depression (b) ratings across age.

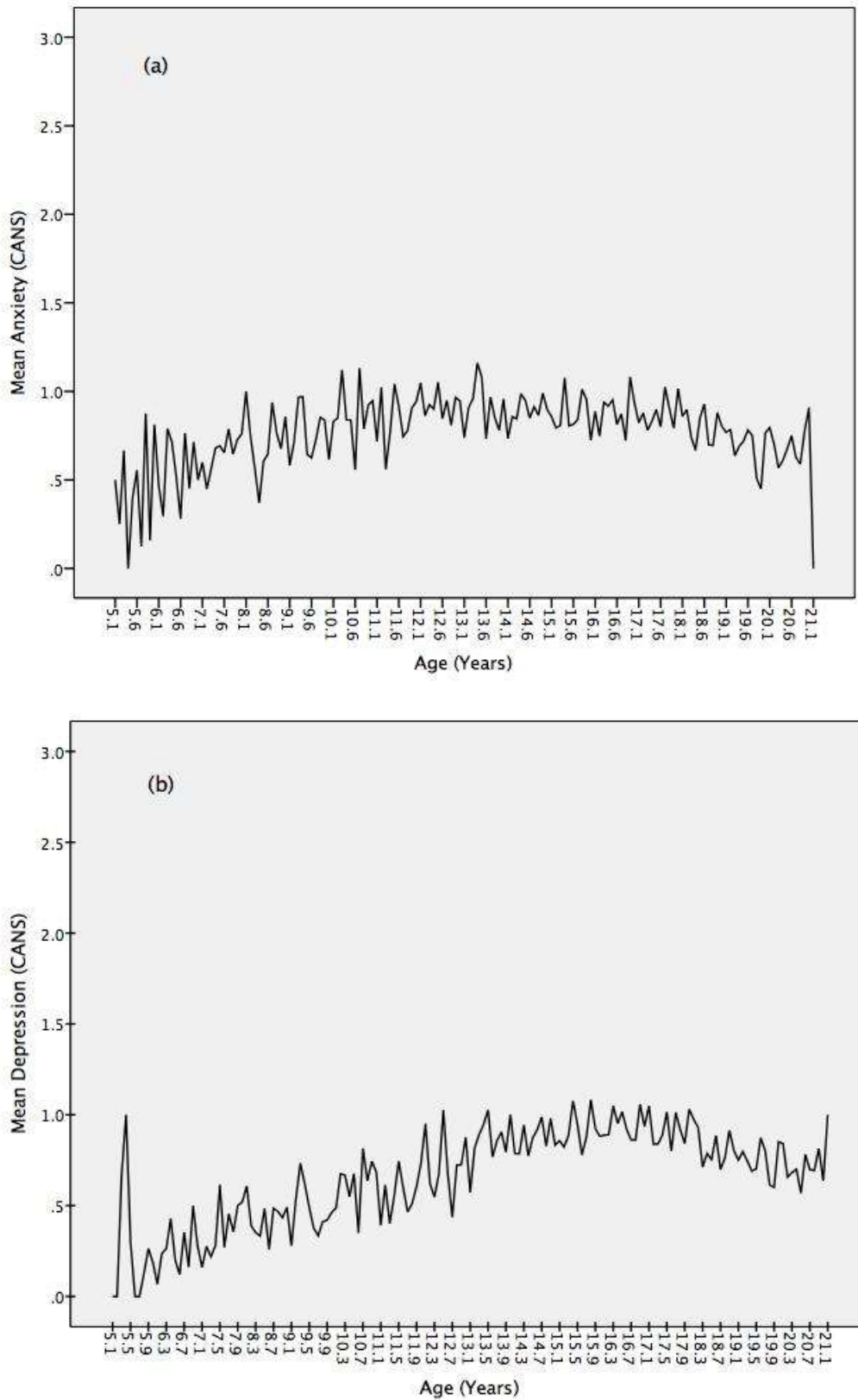


Figure 3. Mean CANS anxiety (a) and depression (b) ratings across time in care.

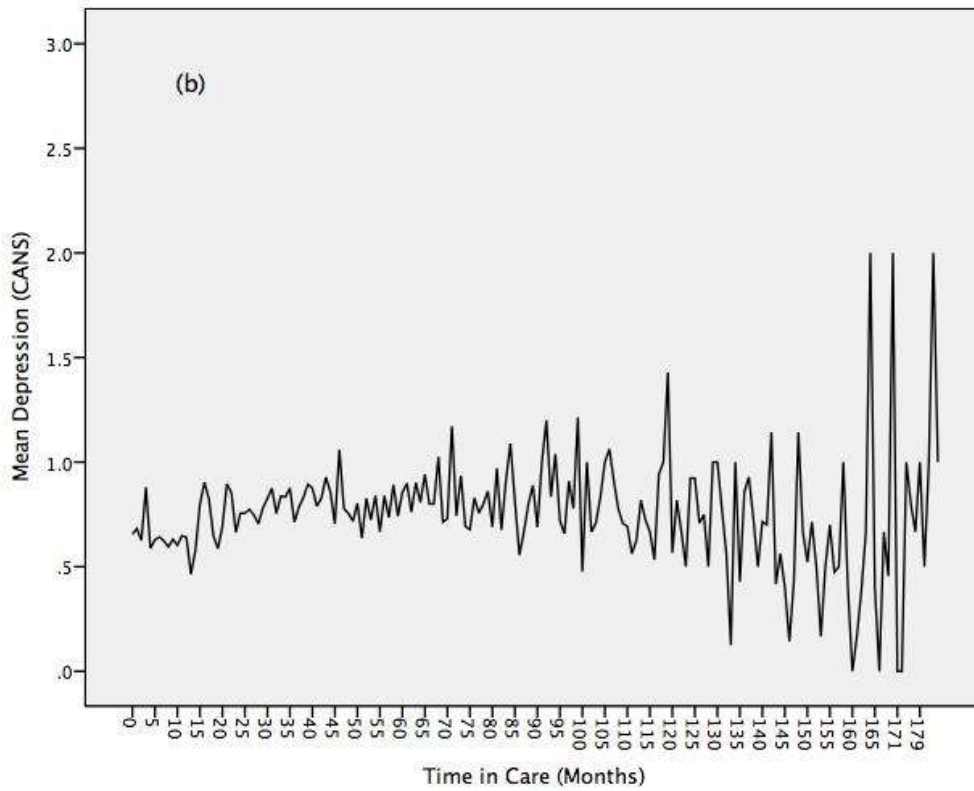
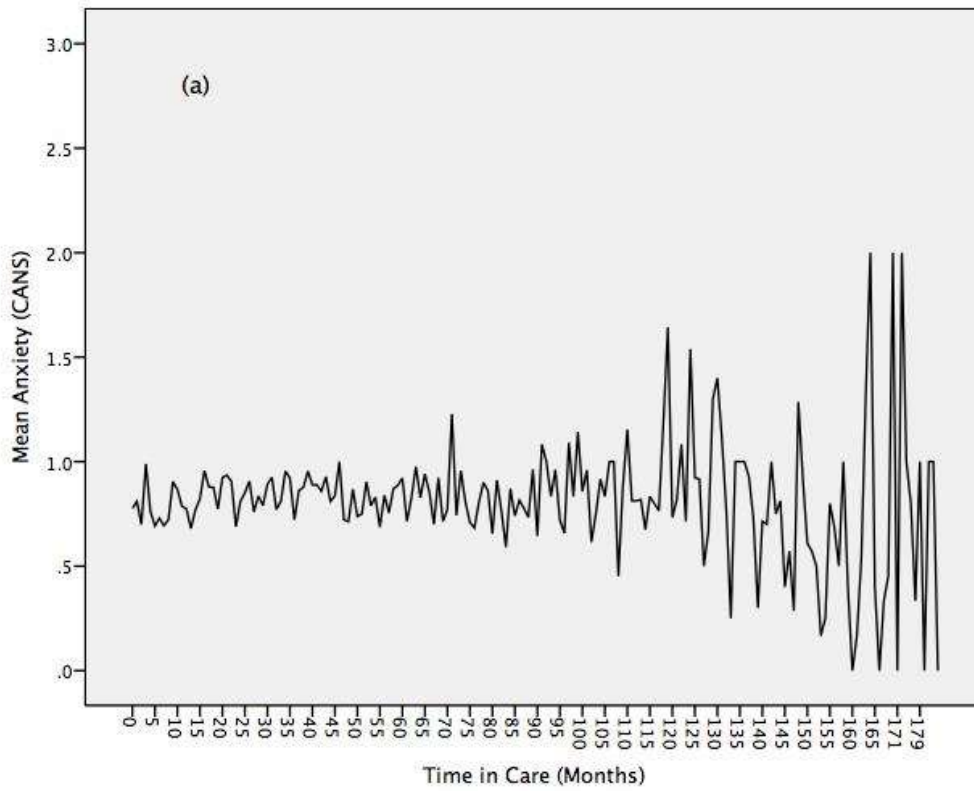


Figure 4. Final resilience model for predictors of ^aanxiety, ^bdepression and ^cboth disorder symptoms for children in out-of-home care.

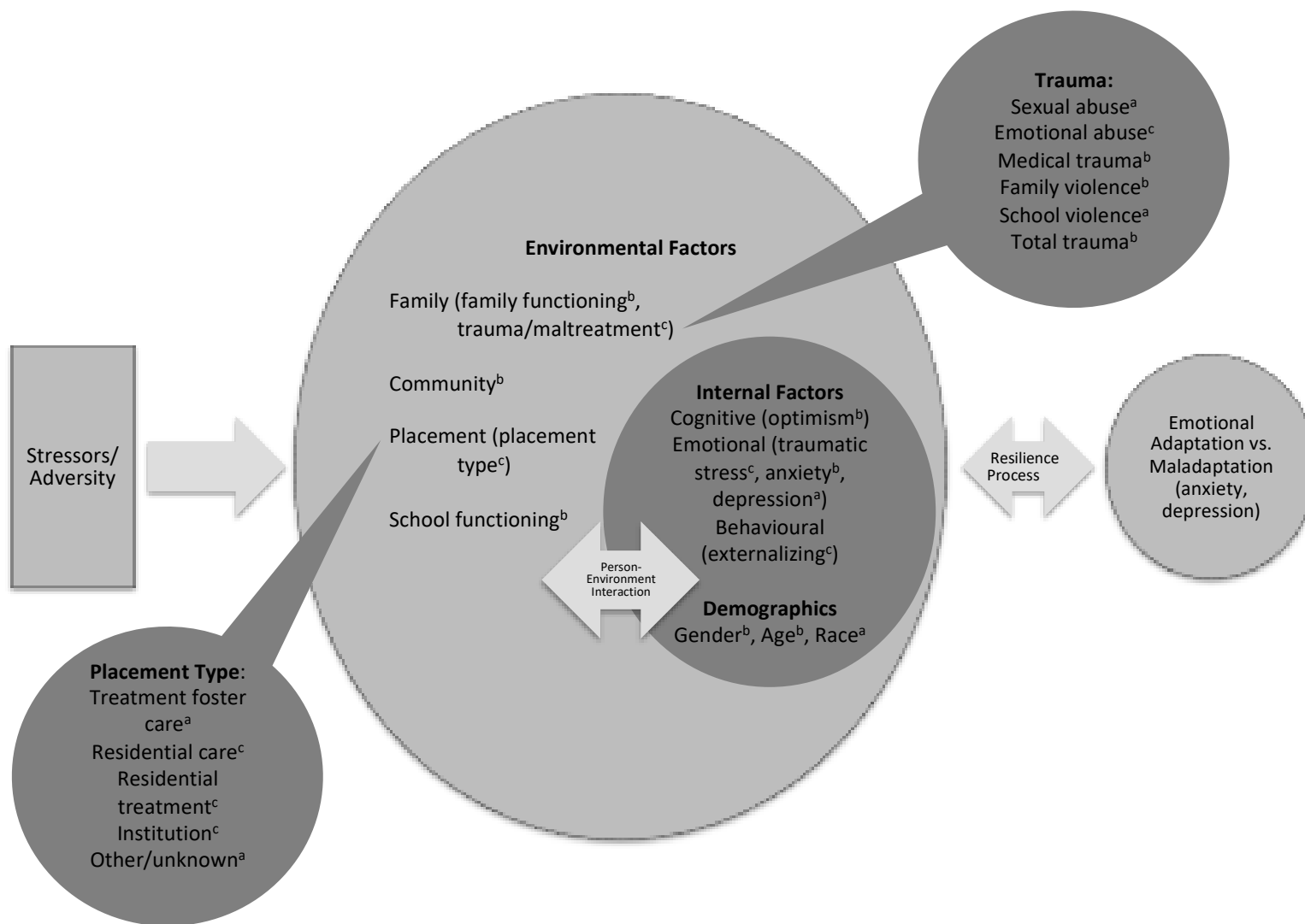
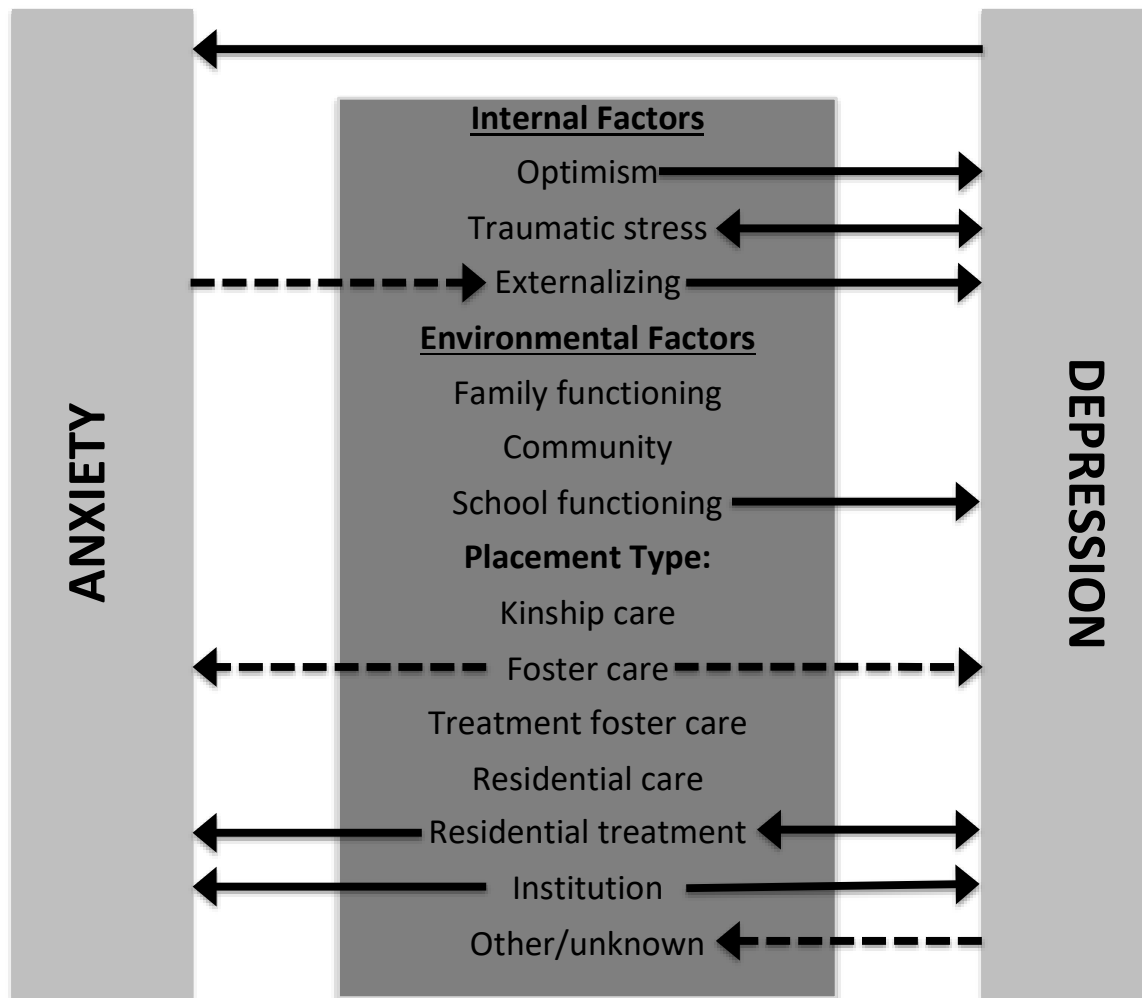


Figure 5. Unidirectional and reciprocal relationships across time for depression, anxiety, and related factors for children in out-of-home care, including positive associations (solid) and negative associations (dashed).



CHILD AND ADOLESCENT NEEDS AND STRENGTHS
Appendix A

01/27/2012

The State of Maryland
CHILD & ADOLESCENT NEEDS & STRENGTHS (CANS):
SCORING MANUAL

Praed Foundation
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A large number of individuals have collaborated in the development of the Maryland CANS. Along with the CANS versions for developmental disabilities, juvenile justice, and child welfare, this information integration tool is designed to support individual case planning and the planning and evaluation of service systems. The trauma items were developed in collaboration with Cassandra Kisiel, Ph.D., Glenn Saxe, M.D., Margaret Blaustein, Ph.D., Heide Ellis, Ph.D. and with the SAMHSA-funded National Child Traumatic Stress Network. The CANS is an open domain tool for use in service delivery systems that address the mental health of youth and their families. The copyright is held by the Praed Foundation to ensure that it remains free to use. For more information about other versions of the CANS, contact:

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Mark Lardner, MSW, LCSW-C

*The Institute for Innovation and Implementation
University of Maryland School of Social Work
525 W. Redwood Street, Baltimore, MD 21201
Baltimore, Maryland 21201*

MD CANS for youth ages 5 years and older

Please ✓ appropriate use: Initial Reassessment Transition/Discharge

Date:

M	M	D	D	Y	Y	Y	Y
---	---	---	---	---	---	---	---

m	m	d	d	y	y
---	---	---	---	---	---

 M F T

Child's Name _____ DOB _____ Gender _____ Race/Ethnicity _____

Current Living Situation: _____

Assessor (Print Name): _____ Signature _____

Caregiver Name: _____ Relation _____

LIFE DOMAIN FUNCTIONING					
0 = no evidence of need	2 = ACT to address need				
1 = monitor, collect more info	3 = ACT immediately, intensely				
	0	1	2	3	NA
Family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Living Situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Social Functioning - Peer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Social Functioning - Adult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Medical/Physical	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Enuresis/Encopresis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sleeping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Intellectual (IQ only)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Speech/Language Delay	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Autism Spectrum/PDD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Recreational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Job Functioning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal (DJS/criminal court)	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Judgment/Decision Making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sexual Development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
School Attendance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Achievement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CHILD BEHAVIORAL/EMOTIONAL NEEDS				
0 = no evidence of need	2 = ACT to address need			
1 = monitor, collect more info	3 = ACT immediately, intensely			
	0	1	2	3
Psychosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attn Deficit/Impulse Control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression/Mood Disorder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppositional Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct/Antisocial Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance Abuse	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Eating Disturbance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger Control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attachment Difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adjustment to Trauma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CHILD & ENVIRONMENTAL STRENGTHS					
0 = centerpiece strength	2 = identified but not yet useful				
1 = identified & useful strength	3 = not yet identified				
	0	1	2	3	NA
Family Environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Educational Environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Vocational Preferences & Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spiritual/Religious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Community Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Relationship Permanence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Natural Supports (i.e., unpaid)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Interpersonal Skills – Peer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Interpersonal Skills – Non-caregiver Adult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Optimism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Talents/Interests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Youth Involvement w/ Care Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Resiliency (History)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Resourcefulness (History)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

CHILD RISK BEHAVIORS				
0 = no evidence of need	2 = ACT to address need			
1 = monitor, collect more info	3 = ACT immediately, intensely			
	0	1	2	3
Suicide Risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Injurious Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reckless Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Danger to Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual Aggression	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Sexually Reactive Behaviors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Runaway	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Delinquent Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fire-Setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Intentional Misbehavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bullying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exploited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ACCULTURATION				
0 = no evidence of need	2 = ACT to address need			
1 = monitor, collect more info	3 = ACT immediately, intensely			
	0	1	2	3
Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural Identity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gender/Sexual Identity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ritual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Go to Next Page ➡

TRAUMA EXPERIENCES (over LIFETIME)				
0 = no evidence		2 = moderate exposure		
1 = suspected or mild exposure		3 = severe exposure		
	0	1	2	3
Sexual Abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neglect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Trauma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Witness to Family Violence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Violence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Violence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural/Man-made Disasters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
War-Affected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrorism-Affected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Witness/Victim to Criminal Activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

TRAUMA STRESS SYMPTOMS				
0 = no evidence of need		2 = ACT to address need		
1 = monitor, collect more info		3 = ACT immediately, intensely		
	0	1	2	3
Traumatic Grief/Separation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Re-experiencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoidance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Numbing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Affect Dysregulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissociation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PERMANENCY PLAN #1 CAREGIVER NEEDS & STRENGTHS				
<i>Identified Caregiver:</i>				
0 = no evidence of need		2 = ACT to address need		
1 = monitor, collect more info		3 = ACT immediately, intensely		
	0	1	2	3
Supervision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involvement with Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attachment Difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility to Child Care Services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential Stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developmental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marital/Partner Conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posttraumatic Reactions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Caregiver Criminal Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CURRENT CAREGIVER NEEDS & STRENGTHS				
<i>Identified Caregiver:</i>				
0 = no evidence of need		2 = ACT to address need		
1 = monitor, collect more info		3 = ACT immediately, intensely		
	0	1	2	3
Supervision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involvement with Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attachment Difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility to Child Care Services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential Stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developmental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marital/Partner Conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posttraumatic Reactions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Caregiver Criminal Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PERMANENCY PLAN #2 (if applicable) CAREGIVER NEEDS & STRENGTHS				
<i>Identified Caregiver:</i>				
0 = no evidence of need		2 = ACT to address need		
1 = monitor, collect more info		3 = ACT immediately, intensely		
	0	1	2	3
Supervision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involvement with Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attachment Difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility to Child Care Services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential Stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developmental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marital/Partner Conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posttraumatic Reactions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Caregiver Criminal Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SHADED areas indicate that user must complete relevant MODULE

SCORING DEFINITIONS & GUIDELINES

Key Characteristics of CANS

Key Characteristics of CANS

1. Item rating levels *translate directly into action*
2. Focus on the youth's needs, not interventions that could mask a need
3. Consider development and culture before translating into action items
4. 30-day window keeps assessments relevant and fresh

The MD CANS is comprised of eight sections of items. These sections are:

- Life Domain Functioning
- Child & Environmental Strengths
- Child Behavioral/Emotional Needs
- Child Risk Behaviors
- Acculturation
- Trauma Experiences
- Trauma Stress Symptoms
- Caregiver Needs & Strengths (Permanency Plan and Current)

The MD CANS also contains four modules that are completed when specific items are scored “1” or higher. These modules are:

- Substance Abuse
- Sexual Aggression
- Runaway
- Fire-setting

GENERAL STRATEGIES FOR USING THIS SCORING MANUAL TO SCORE ITEMS

1. Review the general scoring definitions for the specific CANS section.
2. Read the definition of the specific item.

These two strategies will be sufficient for many instances.

If further guidance is desired, examples and specific possible definitions for each rating (i.e., “0,” “1,” “2,” “3,” or—for some items—“N/A”) are given. However, please note that these examples are not comprehensive.

LIFE DOMAIN FUNCTIONING

How much is the youth struggling in the major areas of life?

For **Life Domain Functioning**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs. No action is required. This may be a strength.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

LD1. FAMILY

This item refers to how the youth is functioning with her/his family. Family ideally should be defined by who the youth identifies as her/his family. However, in the absence of this knowledge, consider biological relatives and their significant others with whom the youth still has contact as the definition of family.

POTENTIAL INTERVIEW QUESTIONS: *How does your family get along? Are there problems between family members? Has there ever been any violence? How is your family getting along right now?*

0	No evidence of problems in relationships with family members and/or youth is doing well in relationships with family members.
1	History or suspicion of problems. Youth might be doing adequately in relationships with family members, although some problems may exist. For example, some family members may have some problems in their relationships with youth.
2	Youth is having significant problems with parents, siblings, or other family members. Frequent arguing, difficulties in maintaining any positive relationship may be observed.
3	Youth is having severe problems with parents, siblings, or other family members. This would include problems of domestic violence, constant arguing, etc.

LD2. LIVING SITUATION

This item refers to how the youth is functioning in their current living arrangement (i.e., “where the youth’s head hits the pillow”), which could be a relative, temporary foster home, shelter, treatment foster care, group home, residential treatment center, etc. This rating should exclude respite, brief detention/jail, and brief medical and psychiatric hospitalization.

POTENTIAL INTERVIEW QUESTION: *How is the youth behaving and getting along with others in the current living situation?*

0	No evidence of problems with functioning in current living environment.
1	Mild problems with functioning in current living situation. Caregivers might be concerned about youth’s behavior in living situation.
2	Moderate to severe problems with functioning in current living situation. Youth has difficulties maintaining her/his behavior in this setting; the behavior creates significant problems for others in the residence and/or youth shows significant impairment in this context.
3	Profound problems with functioning in current living situation. Youth is at immediate risk of being removed from living situation due to his/her behaviors or concerns about welfare/safety.

LD3. SOCIAL FUNCTIONING – PEER

This item rates difficulty a youth may have in relationships with similar-age others. It includes age-appropriate behavior, the ability to make and sustain adaptive peer relationships, and adequate sources of adaptive peer relationships.

POTENTIAL INTERVIEW QUESTIONS: *How well does the youth get along with people around the same age as her/him? Does s/he make new friends easily? Has s/he kept friends a long time or does s/he tend to change friends frequently? Are these friendships healthy? Do these friendships help her/him succeed in life?*

0	No evidence of problems and/or youth has developmentally appropriate social functioning with peers.
1	History/ suspicion or youth is having some minor problems in making and keeping adaptive peer relationships.
2	Youth is having some moderate problems with peer relationships that interfere with other life domains.
3	Youth is experiencing severe disruptions in peer relationships. Youth may have no friends, or s/he has constant conflict in relations with peers, or primary peer relationships are maladaptive. The quality of the youth's peer relationships presents imminent danger to youth's safety, health, and/or development.

LD4. SOCIAL FUNCTIONING – ADULT

This item rates difficulty a youth may have in relationships with adults. It includes age-appropriate behavior, the ability to make and sustain adaptive adult relationships, and adequate sources of adaptive adult relationships.

POTENTIAL INTERVIEW QUESTIONS: *How does the youth get along with adults? Does s/he develop healthy relationships with adults easily? Has s/he kept healthy relationships with adults a long time or does s/he tend to change those frequently?*

0	No evidence of problems and/or youth has developmentally appropriate social functioning with adults.
1	History/ suspicion or youth is having some minor problems in relationships with adults.
2	Youth is having some moderate problems with relationships with adults that interfere with other life domains.
3	Youth is experiencing severe disruptions in relationships with adults. Youth may have no close relationships with adults, or s/he has constant conflict in relations with adults, or primary peer relationships are maladaptive. The quality of the youth's relationships with adults presents imminent danger to youth's safety, health, and/or development.

LD5. MEDICAL/PHYSICAL

This item refers to the youth's current medical health problems and physical impediments (i.e., both acute and chronic). Vision, weight, and asthma concerns would also be rated here. This item excludes mental health issues.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth generally healthy? Does s/he have any medical or physical problems? Does s/he have to see a doctor regularly to treat any problems (like asthma, diabetes)? Are there any activities the youth cannot do because of a physical or medical condition? How much does this interfere with her/his life?*

0	No evidence of health problems and/or child is healthy.
1	Youth has <i>mild</i> medical or physical problems (usually transient and treatable) that require medical evaluation or intervention.
2	Youth has <i>serious</i> medical or physical problems that require medical treatment or intervention. Or youth has a <i>chronic</i> illness or a physical challenge that requires <i>ongoing</i> medical intervention.
3	Youth has <i>life-threatening</i> illness or medical/physical condition. Immediate and/or intense action should be taken due to imminent danger to youth's safety, health, and/or development.

LD6. ENURESIS/ENCOPRESIS

This item describes any needs related to excreting and eliminating bodily wastes into inappropriate places (e.g., bed or clothes). This problem could be involuntary or intentional and applies only to youth age five years or older. Be sure to rate the cause(s) of this problem elsewhere on the CANS, if applicable.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth frequently pee or poop in places besides the toilet?*

0	There is no evidence of toileting problems.
1	History of toileting difficulties but is presently not exhibiting them, except on rare occasion.
2	Youth demonstrates toileting problems on a consistent basis, interfering with functioning.
3	Youth demonstrates significant difficulty with toileting to the extent that youth and parent are in significant distress or interventions have failed.

LD7. SLEEPING

This rating applies to the youth's sleep pattern (i.e., a full night's sleep).

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have problems with sleep? Does s/he sleep through the night? Is his/her sleep disturbed by nightmares or bedwetting?*

0	Youth gets a full night's sleep each night.
1	Youth has some problems sleeping. Generally gets a full night's sleep but has some sleep disturbances related to difficulty falling asleep, staying asleep, nightmares, or bedwetting.
2	Youth has frequent problems with sleep. Sleep is often disrupted and youth seldom obtains a full night's sleep.
3	Youth is generally sleep-deprived. Sleep is difficult for youth and s/he are not able to get a full night's sleep.

DEVELOPMENT DELAY ITEMS: Intellectual, Speech/Language Delay, & Autism Spectrum / PDD

POTENTIAL INTERVIEW QUESTIONS: *Does the youth's growth and development seem healthy? Has s/he reached appropriate developmental milestones (such as walking, talking)? Has anyone ever mentioned that the youth may have developmental problems? Has the youth developed like other children her/his age?*

LD8. INTELLECTUAL (IQ only)

This rating describes the youth's cognitive/intellectual functioning.

POTENTIAL INTERVIEW QUESTIONS: *In general, does the youth learn as quickly as other youth around the same age? Has the youth's intelligence ever been assessed? What is the youth's IQ score?*

0	No evidence that youth has any problems with intellectual functioning and/or youth's intellectual functioning appears to be in normal range.
1	Borderline to low average IQ (IQ between 70 and 85).
2	Mild to moderate delayed intellectual functioning (IQ between 50 and 70).
3	Severe or profound delayed intellectual functioning (IQ less than 50).

LD9. SPEECH/LANGUAGE DELAY

This rating describes the youth's ability to understand, process, and express language. Youth with a history of hearing problems or neglect are at risk for language development delays.

POTENTIAL INTERVIEW QUESTIONS: *Compared to other youth the same age, did the youth start talking on time? Is the youth's speech understandable to most people? Has a teacher, doctor, or anyone else ever expressed concern about the youth's speech and language development? Should speech and language therapy services be included in an intervention plan (e.g., in school)?*

0	No evidence of delays in speech and language development. Youth is able to understand and express self without difficulty.
1	Youth has mild difficulties with receptive or expressive ability. For instance, youth stutters or frequently requires repetition due to not understanding/processing directions given.
2	Speech and language presents a real frustration and barrier to social functioning for youth. A youth who meets criteria for a communication disorder, would be rated here.
3	Youth is unable to communicate at all or only on a very basic level with sounds or a very limited vocabulary.

LD10. AUTISM SPECTRUM / PDD

This rating describes symptoms of pervasive developmental disorders (PDDs), such as Autism, Asperger's, PDD NOS, Rett Syndrome, and Child Disintegrative Disorder. Youth with these symptoms demonstrate deficits in 1) social interaction, 2) verbal and nonverbal communication, and 3) repetitive behaviors or interests. In addition, they will often have unusual responses to sensory experiences, such as certain sounds or the way objects look. Each of these symptoms can be mild to severe and present in each individual youth differently.

POTENTIAL INTERVIEW QUESTIONS: *Since birth how responsive to people was the youth, compared to other youth of the same age? As a baby or toddler, did the youth maintain eye contact, respond to his/her name, and smile as often, as other children of the same age? Was the youth able to see the world through someone else's perspective? Compared to other youth of the same age, were there any delays in speaking? Since birth, does the youth focus on one object for long periods of time or have a hard time with breaks in routine?*

0	No evidence of a pervasive developmental disorder.
1	Evidence of a mild PDD. Youth may have symptoms of a PDD, but symptoms are below threshold for a PDD diagnosis and do not have a significant effect on youth's development.
2	Youth meets criteria for a PDD. Developmental delays create significant challenges for this youth.
3	Severe PDD. Youth is unable to meet developmental milestones.

LD11. RECREATIONAL

This item is intended to reflect the youth's interest in, access to, and use of adaptive leisure time activities.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have things that s/he likes to do with free time? Things that give her/him pleasure? Activities that are a positive use of her/his extra time? Does s/he often claim to be bored or have nothing to do?*

0	Youth has and enjoys adaptive recreational activities on an ongoing basis.
1	Youth is doing adequately with recreational activities, although some problems may exist.
2	Youth is having moderate problems with recreational activities. Youth may experience some problems with effective use of leisure time.
3	Youth has no access to or interest in recreational activities. Youth has significant difficulties making use of leisure time.

LD12. JOB FUNCTIONING

This item is intended to describe functioning in vocational settings. If a youth is not working and is not involved in any prevocational activities, this item should be rated 'N/A'. Youth aged 12 or younger typically would be rated 'N/A' here.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have a job? If so, how is s/he doing at work?*

0	No evidence of any problems in work environment.
1	Youth has some mild problems at work (e.g., tardiness, conflict).
2	Youth has problems at work.
3	Youth has severe problems at work in terms of attendance, performance or relationships. Youth may have recently lost job.
N/A	Not applicable. Youth is not currently or recently employed.

LD13. LEGAL (DJS/Criminal Court)

This item involves only the youth's involvement with the legal system due to youth's behavior (i.e., juvenile/criminal courts). Do not rate CINA review hearings or family court involvement here.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever admitted that s/he has broken the law? Has s/he ever been arrested? Has s/he ever been in detention?*

0	Youth has no known legal difficulties.
1	Youth has a history of legal problems but currently is not involved with the legal system.
2	Youth has some legal problems and is currently involved in the legal system.
3	Youth has serious current or pending legal difficulties that place him/her at risk for a court-ordered out of home placement.

LD14. JUDGMENT/DECISION-MAKING

This item describes the youth's age-appropriate decision-making processes and awareness of consequences. Ratings greater than "0" indicate that the youth requires more supervision than typically expected for the youth's age to keep the youth and others safe.

POTENTIAL INTERVIEW QUESTIONS: *Does s/he typically make good choices for him/herself? Do his/her choices ever result in harm to the youth or others? If the youth were left alone, how safe and responsible would the youth's decisions be, compared to other youth of the same age?*

0	No evidence of problems with judgment or decision-making, resulting in harm to development and/or safety.
1	History of problems with judgment in which the youth makes harmful decisions. For example, youth has a history of hanging out with other youth who shoplift.
2	Youth makes decisions harmful to her/his development or well-being more often than other similar-age youth. Therefore, youth requires supervision greater than expected for youth's age.
3	Youth makes decisions that would likely result in significant physical harm to self or others. Therefore, youth requires intense and constant supervision, over and above that expected for youth's age.

LD15. SEXUAL DEVELOPMENT

This rating describes issues around sexual development including developmentally inappropriate sexual behavior and sexual behavior presenting risk to the youth's safety and overall health. Please note that sexual orientation or gender identity issues should be rated in the Acculturation section.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth sexually active? Is there any reason to worry about her/his sexual behavior? Does the youth have less interest/more interest in sex than other youth her/his age?*

0	No evidence of any problems with sexual development.
1	Mild to moderate problems with sexual development. Youth might have some issues with sexually acting out but this behavior does not affect other areas of life.
2	Significant problems with sexual development. This behavior affects other areas of life. May include multiple older partners or high-risk sexual behavior.
3	Profound problems with sexual development. This level would include prostitution, very frequent risky sexual behavior, or sexual aggression.

LD16. SCHOOL ATTENDANCE

This item rates issues of tardiness and/or truancy. If school is not in session, rate the last 30 days when school was in session.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth had any difficulty with getting to or staying in school? Has the teacher or other school personnel expressed concern about the youth's attendance?*

0	No evidence of attendance problems. Youth attends regularly.
1	Youth has some problems attending school but generally goes to school. S/he may miss up to one day per week on average. Or s/he may have moderate to severe problems in the past six months but has been attending school regularly in the past month.
2	Youth is having problems with school attendance. S/he is missing at least two days per week on average.
3	Youth is not going to school. Youth is generally truant or refusing to go to school.
N/A	Not applicable based on youth's age.

LD17. SCHOOL ACHIEVEMENT

This item rates the youth's grades or level of academic achievement. Failing most subjects or being more than one year behind same-age peers would be rated '3.'

POTENTIAL INTERVIEW QUESTIONS: *How is the youth doing academically? Is s/he having difficulty with any subjects? Is s/he at risk of failing any classes? Of being left back? Has the teacher or other school personnel expressed concern about the youth's academic performance?*

0	No evidence of issues in school achievement and/or youth is doing well in school.
1	Youth is doing adequately in school, although some problem with achievement exists.
2	Youth is having moderate problems with school achievement. S/he may be failing some subjects.
3	Youth is having severe achievement problems. S/he may be failing most subjects or has been retained a grade level ("left back"). Youth might be more than one year behind same-age peers in school achievement.
N/A	Not applicable based on youth's age.

LD18. SCHOOL BEHAVIOR

This item rates the behavior of the youth in school or school-like settings (e.g., Head Start, pre-school). A rating of '3' would indicate a youth, who is still having problems after special efforts have been made (e.g., problems in a special education class). If youth is currently not attending (e.g., summer break, expelled, truancy), rate behavior when youth last attended.

POTENTIAL INTERVIEW QUESTIONS: *How is the youth doing in school? Has the teacher or other school personnel expressed concerns about the youth's behavior?*

0	No evidence of behavior problems at school or day care and/or youth is behaving well.
1	Youth is behaving adequately in school, although some behavior problems exist. May be related to either relationship with teachers or peers. A single detention might be rated here.
2	Youth is having moderate behavioral difficulties at school. S/he is disruptive and may have received sanctions including suspensions or multiple detentions.
3	Youth is having severe problems with behavior in school. S/he is frequently or severely disruptive. School placement may be in jeopardy due to behavior.
N/A	Not applicable based on youth's age.

CHILD & ENVIRONMENTAL STRENGTHS

What protective resources are currently available to the youth?

How useful are their protective resources, particularly when youth is faced with adversity?

For **Child & Environmental Strengths**, the following categories and action levels are used:

- 0 Identified & highly useful strength** - can be used as a centerpiece for a strength-based plan.
- 1 Identified & useful strength** - resource requires further development to serve as a focus of a strength-based plan.
- 2 Identified, but not yet useful strength** – potential resource requires significant development before it can be effectively utilized as a focus of a strength-based plan.
- 3 Not yet identified strength** - efforts are needed to identify potential resource(s) for strength-building efforts.

CES1. FAMILY ENVIRONMENT

Family refers to all biological or adoptive relatives with whom the youth remains in contact along with other individuals in relationships with these relatives. This item reflects how much the family as a whole (including the youth) feels connected, committed, and loved by one another. Ratings should include level of cohesion and quality of communication among family members.

POTENTIAL INTERVIEW QUESTIONS: *How do you care about one another in your family? Is there usually good communication? Is this an area that you could use some help to develop?*

0	Significant family strengths. This level indicates a family with much love and mutual respect for each other. Family members are central in each other's lives ("tight"). Youth is fully included in family activities.
1	Moderate level of family strengths. This level indicates a loving family with generally good communication and ability to enjoy each other's company. There may be some problems between family members and they sometimes need help with getting along and talking. Youth is generally included.
2	Mild level of family strengths. Family is able to communicate and participate in each other's lives; however, family members may not be able to provide significant emotional or concrete support for each other. Youth is often not included in family activities.
3	No evidence of any family relationships as strength at this time. Youth might not have identified family or identified family requires significant assistance to develop relationships and ability to communicate. Youth might not be included in normal family activities.

CES2. EDUCATIONAL ENVIRONMENT

This rating refers to the nature of the school's relationship with youth and family, as well as the level of support youth receives from the school. Rate according to how much the school is an effective partner in promoting youth's functioning and addressing youth's needs in school.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth's school an active partner in figuring out how to best meet the youth's needs. Does the youth like this school? When has the youth been at his/her best in school?*

0	The school is an effective advocate on behalf of the child and family to identify and successfully address the child's educational needs.
1	The school occasionally works with child and family to identify and address the child's educational needs.
2	School is currently unable to adequately address youth's academic or behavioral needs.
3	No evidence of the school working to identify or successfully address youth needs and/or school is unable or unwilling to work to identify and address youth needs and/or there is no school to partner with at this time.

CES3. VOCATIONAL PREFERENCES & SKILLS*

This item rates the development of skills which could be applied to a vocation including prevocational skills and work experience. Generally this rating is reserved for adolescents and is not applicable for youth 12 years and under. Computer skills would be rated here.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth know what s/he wants to be when s/he grows up? Are his/her goals realistic? Has s/he ever worked? Does s/he have plans for a career?*

0	Youth has stated a vocational preference and has vocational skills and work experience related to that preference.
1	Youth has some vocational skills or work experience, which will be generally useful for future employment.
2	Youth has some pre-vocational skills. Youth may have a clear vocational preference.
3	No evidence of vocational/pre-vocational skills or work experience and no expression of any vocational preference.

CES4. SPIRITUAL/RELIGIOUS*

This item refers to youth's experience of receiving comfort and support from religious or spiritual involvement.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth involved with any religious community? Does the youth have spiritual beliefs that provide comfort?*

0	Youth is involved in and receives significant comfort or support from spiritual/religious beliefs, practices and/or community. For example, youth is very involved in her church youth group, has many friends there, and derives a sense of belonging from her participation.
1	Youth is involved in and receives some comfort or support from spiritual/religious beliefs, practices, and/or community.
2	Youth has expressed some interest in spiritual/religious belief and practices.
3	No evidence of identified spiritual/religious beliefs, nor does youth show any interest in these pursuits.

CES5. COMMUNITY LIFE

This item reflects the youth's connection to people, places, or institutions in her/his community. This connection is measured by the degree to which the youth is involved with institutions of that community which might include (but are not limited to) community centers, little league teams, jobs, after-school activities, religious groups, etc. Connections through specific people (e.g., friends and family) could be considered an important community connection, if many people who are important to the youth live in the same neighborhood.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth active in a community? Is s/he a member of a community organization or group? Are there things that the youth does in the community?*

0	Youth has extensive and substantial, long-term ties with the community.
1	Youth has some significant community ties, albeit they may be relatively short term (i.e., past year).
2	Youth has an identified community but has only limited, or unhealthy, ties to that community
3	No evidence of an identified community of which s/he is a member at this time. For example, because youth has moved a lot or has been in multiple foster care settings, s/he may have lost their sense of connection to community life. Or youth lives in a campus-based residential treatment facility or residential drug rehabilitation facility (unless s/he has significant involvement in the community off-campus).

CES6. RELATIONSHIP PERMANENCE

This rating refers to the stability of significant relationships in the youth's life. This likely includes family members but may also include other individuals.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have relationships with adults that have lasted her/his lifetime? Is s/he in contact with both parents? Are there relatives in the youth's life with whom s/he has long-lasting relationships?*

0	This level indicates a youth who has very stable relationships. Family members, friends, and community have been stable for most of his/her life and are likely to remain so in the foreseeable future. Youth may have a stable relationship with both parents.
1	This level indicates a youth who has had stable relationships but there is some concern about instability in the near future (one year) due to transitions, illness, or age. A youth who has a stable relationship with only one parent may be rated here.
2	This level indicates a youth who has had at least one stable relationship over his/her lifetime but has experienced other instability through factors such as divorce, moving, removal from home, and death.
3	This level indicates a youth who does not have any stability in relationships. Youth might have to live "on their own" or be adopted.

CES7. NATURAL SUPPORTS (i.e., unpaid)

These ratings refer to unpaid helpers in the youth's natural environment. These include individuals who provide social support to the target youth and family.

0	Youth has significant natural supports, who routinely support the youth's healthy development.
1	Youth has identified natural supports, who sometimes support the youth's healthy development.
2	Youth has some identified natural supports; however, they are not actively contributing to the youth's healthy development.
3	Youth has no known natural supports.

INTERPERSONAL SKILLS

Interpersonal skills are rated independently of Social Functioning, because a child can have social skills but still struggle in his or her relationships at a particular point in time. Thus, this strength indicates an ability to make and maintain long-standing relationships.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth pleasant and likeable? Do adults or other children like him/her? Do you feel that the youth can act appropriately in social settings?*

CES8. INTERPERSONAL SKILLS-PEER

This rating refers to the youth's social and relationship skills with peers, specifically similar-age others.

0	Significant interpersonal strengths with similar-age peers. Youth is seen as well-liked by peers and has significant ability to form and maintain prosocial, adaptive relationships with peers. Individual has <i>multiple</i> close friends and is friendly with others.
1	Moderate level of interpersonal strengths. Youth has formed prosocial, adaptive interpersonal relationships with similar-age peers. Youth may have one friend, if that friendship is a healthy "best friend."
2	Mild level of interpersonal strengths with similar-age peers. Youth needs help getting and keeping friends. Youth has some social skills that facilitate prosocial and adaptive relationships with peers. Youth may not have any current close relationships, but has a history of making and maintaining healthy friendships with peers.
3	No evidence of observable interpersonal skills or healthy friendships with similar-age peers at this time and/or youth requires significant help to learn to develop interpersonal skills and healthy friendships.

CES9. INTERPERSONAL SKILLS-ADULT (i.e., non-caregiver adults)

This rating refers to the youth's social and relationship skills with non-caregiver adults.

0	Significant interpersonal strengths with adults. Youth is seen as well-liked by adults and has significant ability to form and maintain prosocial, adaptive relationships with adults. Individual has <i>multiple</i> close supportive relationships with non-caregiver adults.
1	Moderate level of interpersonal strengths. Youth has formed prosocial, adaptive relationships with non-caregiver adults.
2	Mild level of interpersonal strengths. Youth needs help forming and maintaining healthy relationships with adults. Youth has some social skills that facilitate prosocial, adaptive relationships with non-caregiver adults. Youth may not have any current relationships, but has a history of making and maintaining healthy relationships with non-caregiver adults.
3	No evidence of observable interpersonal skills or healthy friendships with adults at this time and/or youth requires significant help to learn to develop interpersonal skills and healthy relationships with adults.

CES10. OPTIMISM

This rating should be based on the youth's sense of self in his/her own future. This is intended to rate the youth's positive future orientation.

POTENTIAL INTERVIEW QUESTIONS: *Does s/he have a generally positive outlook on things? Does s/he have things to look forward to? Does s/he have plans for the future? Is s/he forward-looking and see him/herself as likely to be successful?*

0	Youth has a strong and stable optimistic outlook on her/his future.
1	Youth is generally optimistic about her/his future. Youth is likely able to articulate some positive future vision.
2	Youth has difficulties maintaining a positive view of self and life. Youth may vary from overly optimistic to overly pessimistic.
3	No evidence of optimism at this time and/or youth has difficulties seeing any positives about self or life.

CES11. TALENT/INTERESTS*

This item refers to hobbies, skills, artistic interests, and talents that are healthy ways that young people can spend their time and that also give them pleasure and a positive sense of self.

POTENTIAL INTERVIEW QUESTIONS: *What are the youth's talents or interests? What are things that the youth does particularly well? What does s/he enjoy?*

0	Child has a talent, interest, or hobby that provides him/her with pleasure and/or self-esteem.
1	Child has a talent, interest, or hobby that has the potential to provide him/her with pleasure and self-esteem.
2	Child has a talent, interest, or hobby. It is unclear if this provides him/her with any benefit.
3	No evidence of identified talents, interests, or hobbies at this time, and/or youth requires significant assistance to identify and develop talents and interests.

CES12. YOUTH INVOLVEMENT WITH CARE (i.e., insight and motivation for change)

This item refers to the youth's participation in efforts to address his/her identified needs. Participation is characterized by insight/awareness of needs and motivation to make changes to address needs.

0	Youth is knowledgeable of needs and helps direct planning to address them.
1	Youth is knowledgeable of needs and participates in planning to address them.
2	Youth is somewhat knowledgeable of needs but is not willing to participate in plans to address them.
3	Youth is neither knowledgeable about needs nor willing to participate in any process to address them.

CES13. RESILIENCY (i.e., history of recovery after adversity)

Resilience refers to a process leading to youth recovery from events threatening youth wellness. Although this is a youth-focused item, everyone in the youth's life (i.e., youth, family, and society) contributes to the resiliency process. This rating describes the youth's history of recovery victories; that is, the youth regained enough functioning to accomplish major developmental tasks after adverse events. Previous recovery victories indicate potential for future recovery victories.

0	Youth has achieved and maintained multiple recovery victories (and/or has even surpassed her/his baseline functioning).
1	Youth has achieved and maintained one recovery victory or multiple partial recoveries (with <i>perhaps</i> occasional assistance in maintaining progress).
2	Youth has demonstrated some partial recoveries, but continues to require moderate to significant assistance in maintaining progress.
3	No evidence of recovery at this time and/or youth requires significant assistance in achieving recovery.

CES14. RESOURCEFULNESS (i.e., history of effective support seeking)

This rating describes the youth's history of recognizing appropriate social support resources and effectively utilizing these resources in the face of adversity with the purpose of fostering recovery.

0	Youth has demonstrated on multiple occasions that s/he effectively recognizes and utilizes appropriate social support resources.
1	Youth has demonstrated on one occasion that s/he effectively recognizes and utilizes appropriate social support resources.
2	Youth has demonstrated that s/he can recognize appropriate social support resources but requires significant assistance to effectively utilize these resources.
3	No evidence that youth can recognize nor utilize appropriate social support resources and/or youth requires significant assistance in developing these skills.

**Vocational, Talents/Interests, and Spiritual/Religious have been found to be the three best predictors for positive outcomes for children involved in the mental health and juvenile justice systems. Children who had strengths in these areas were less likely to be rearrested than those who did not.*

CHILD BEHAVIORAL/EMOTIONAL NEEDS

To what degree do mental health challenges impair the youth/family's life?

For **Behavioral/Emotional Needs**, the following categories and symbols are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates a history, suspicion, or mild level of need, thus requiring *monitoring, watchful waiting, or preventive activities*.
- 2** indicates moderate need (i.e., impairing at least one life domain), thus requiring *action* to address this need.
- 3** indicates severe need (i.e., impairing multiple life domains), thus requiring *immediate or intensive action*.

BEN1. PSYCHOSIS

The primary symptoms of psychosis include hallucinations (experiencing things others do not experience), delusions (a false belief or an incorrect inference about reality that is firmly sustained despite the fact that nearly everybody thinks the belief is false or proof exists of its inaccuracy), unusual thought processes, strange speech, or bizarre behavior. The most common form of hallucinations is tactile, followed by auditory, and then visual. DSM-IV disorders included on this dimension are schizophrenia, schizoaffective disorder, schizophreniform disorder, brief psychotic disorder, delusional disorder, shared psychotic disorder, substance-induced psychosis, psychosis due to a general medical condition, psychosis NOS.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever talked about hearing, seeing or feeling something that was not actually there? Has the youth ever done strange or bizarre things that didn't seem to make sense? Does the youth have strange beliefs about things? Has anyone ever told you that the youth has a thought disorder or a psychotic condition?*

0	No evidence of thought disorder. Both thought processes and content are within normal range.
1	History, suspicion, or mild level of need regarding thought processes or content. The youth may be somewhat tangential in speech or evidence somewhat illogical thinking (age inappropriate). This category would be used for youth who are sub-threshold for one of the DSM diagnoses listed above.
2	Moderate disturbance in thought processes or content. The youth may be somewhat delusional or have brief or intermittent hallucinations. The youth's speech may be at times quite tangential or illogical. This level would be used for youth who meet the diagnostic criteria for one of the disorders listed above.
3	Severe psychotic disorder. The youth frequently experiences symptoms of psychosis and frequently has no reality assessment. There is evidence of ongoing delusions, hallucinations or both. Command hallucinations would be coded here. This level is used for extreme cases of the diagnoses listed above.

BEN2. ATTENTION DEFICIT/IMPULSE CONTROL

This rating focuses on the loss of control or intentional behavior, sometimes referred to as problems in executive functioning. Youth with impulse problems tend to engage in behavior without thinking, regardless of consequences. Symptoms of Attention Deficit and Hyperactivity Disorder and Impulse Control Disorder would be rated here. Inattention/distractibility not related to opposition would also be rated here.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth able to sit still for any length of time? Does s/he have trouble paying attention for more than a few minutes? Is the youth able to control him/herself? Does the youth report feeling compelled to do something despite negative consequences?*

0	No evidence of attention, hyperactivity, or impulse problems.
1	History, suspicion, or mild level of need regarding attention, hyperactivity, or impulse control. Youth may have some difficulties staying on task for an age appropriate time period.
2	Moderate symptoms of attention, hyperactivity, or impulse control problems. A youth who meets DSM-IV diagnostic criteria for ADHD would be rated here.
3	Severe impairment of attention/dangerous impulse control problems. Frequent impulsive behavior is observed or noted that carries considerable safety risk (e.g. running into the street, dangerous driving or bike riding). A youth with profound symptoms of ADHD would be rated here.

BEN3. DEPRESSION/MOOD DISORDER

Symptoms included in this dimension are irritable, depressed, or manic mood, social withdrawal, sleep disturbances, weight/eating disturbances, and loss of motivation. This dimension can be used to rate symptoms of the following mood disorders as specified in DSM-IV: dysthymic disorder, major depressive disorder, depressive disorder NOS, bipolar disorder NOS, bipolar I, bipolar II, mood disorder NOS.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth seem depressed or irritable? Has s/he withdrawn from normal activities? Does the youth seem lonely or not interested in others?*

0	No evidence of mood disorder symptoms.
1	History, suspicion, or mild level of need regarding mood disorder symptoms. Mild symptoms associated with a recent negative life event with minimal impact on life domain functioning.
2	Moderate level of mood disorder symptoms that interfere with functioning in at least one life domain. This level is used to rate youth who meet the criteria for an affective disorder listed above.
3	Severe level of mood disorder symptoms. This would include a youth who stays at home or in bed all day due to depression or one whose emotional symptoms prevent any participation in school, friendship groups, or family life. Disabling forms of depressive diagnoses would be coded here. This level is used to indicate a severe case of one of the disorders listed above.

BEN4. ANXIETY

This item describes the youth's level of fearfulness, worrying, panic attacks, or other characteristics of anxiety disorders.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have any problems with anxiety or fearfulness? Is s/he avoiding normal activities out of fear? Does the youth act frightened or afraid? Does the youth worry a lot?*

0	No evidence of any anxiety or fearfulness.
1	History, suspicion, or mild level of need regarding anxiety disorder symptoms. Mild to moderate symptoms associated with a recent negative life event. This level is used to rate either a mild phobia or anxiety problem or a sub-threshold level of symptoms for the other listed disorders.
2	Moderate level of anxiety disorder symptoms that has interfered significantly in youth's ability to function in at least one life domain.
3	Severe level of anxiety disorder symptoms that makes it virtually impossible for the youth to function in any life domain.

BEN5. OPPOSITIONAL BEHAVIOR (Non-compliance with authority)

This item is intended to capture how the youth relates to authority across contexts. Authority figures include caregivers, school officials, police, and other powerful adults. Oppositional behavior is different from conduct disorder in that the emphasis of the behavior is on non-compliance to authority rather than on seriously breaking social rules, norms, and laws.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth do what adults and other people of authority ask him/her to do? Have teachers or other adults reported that the youth does not follow rules or directions? Does the youth argue with adults when they try to get her/him to do something?*

0	No evidence of oppositional behavior. Youth is generally compliant, recognizing that all children and youth fight authority some.
1	History, suspicion, or mild level of need regarding compliance with authority figures. Behavior has minimal impact on life domain functioning. Youth may occasionally talk back to teacher, parent/caregiver. Caregiver may receive letters or calls from school regarding youth's noncompliance with school rules.
2	Moderate problems with compliance with authority figures. Behavior interferes with functioning in at least one life domain. A youth who meets the criteria for Oppositional Defiant Disorder in DSM-IV would be rated here.
3	Severe problems with compliance with authority figures. Behavior interferes with functioning in multiple life domains. A youth rated at this level would be a severe case of Oppositional Defiant Disorder. They would be virtually always noncompliant. Youth repeatedly ignores authority.

BEN6. CONDUCT / ANTISOCIAL BEHAVIOR

These symptoms indicate purposeful acts against society, rule-breaking for sport, satisfaction from subordination or pain of others, and lack of remorse/quilt for such acts. Acts include antisocial behaviors like pathological lying, shoplifting/stealing, vandalism, deliberate destruction of property, cruelty to animals, and assault. This dimension would include the symptoms of Conduct Disorder as specified in the DSM. Training example: Youth blindfolded foster sister, told her to walk down the steps, and – while there were still four steps remaining – told her she'd reached the bottom of the steps.

POTENTIAL INTERVIEW QUESTIONS: *Is the youth honest? How does the youth handle telling the truth/lies? Has the youth been part of any criminal behavior? Has the youth ever shown violent or threatening behavior towards others? Has the youth ever tortured animals or set fires?*

0	No evidence of serious violations of others or laws.
1	History, suspicion, or mild level of need regarding antisocial behavior. Youth may have some difficulties in school and home behavior. Problems are recognizable but not notably deviant for age, sex, and community. This might include occasional truancy, repeated severe lying, or petty theft from family.
2	Moderate antisocial behavior. This could include episodes of planned aggressive or other antisocial behavior. A youth rated at this level should meet the criteria for a diagnosis of Conduct Disorder.
3	Severe antisocial behavior. This could include frequent episodes of unprovoked, planned aggressive or other antisocial behavior that places youth or community at significant risk of physical harm due to these behaviors.

BEN7. SUBSTANCE ABUSE

These symptoms include use of alcohol and illegal drugs, the misuse of prescription medications and the inhalation of any substance for recreational purposes. This rating is consistent with DSM-IV Substance-related Disorders.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth used alcohol or any kind of drugs on more than an experimental basis? Does the youth have an alcohol or drug use problem? Has anyone reported that they think the youth might be using alcohol or drugs?*

0	No evidence of substance use. If the person is in recovery for greater than 1 year, they should be coded here although this is unlikely for a youth.
1	History, suspicion, or mild level of need regarding substance use that might occasionally impair functioning (e.g., intoxication, loss of money, reduced school performance, parental concern). This rating would be used for someone early in recovery (less than 1 year) who is currently abstinent for at least 30 days.
2	Moderate substance abuse problem that interferes with functioning in at least one life domain and thus requires treatment. Substance abuse problems consistently interfere with the ability to function optimally but do not completely preclude functioning in an unstructured setting.
3	Severe substance abuse problem. Youth requires detoxification, is dependant or addicted to alcohol and/or drugs. Youth intoxicated at the time of assessment (i.e., currently under the influence) is included here. A substance-exposed infant who demonstrates symptoms of substance dependence would be rated here.

BEN8. EATING DISTURBANCE

This item describes any needs involving the youth's food intake, such as food hoarding, overeating, anorexia, bulimia, rigid food preferences, and inability to chew/swallow due to muscle problems. Pica (i.e., persistently eating non-nutritive substances) would also be included.

POTENTIAL INTERVIEW QUESTIONS: *How does the youth feel about his/ her body? Does s/he seem to be overly concerned about his/her weight? Does s/he ever refuse to eat, binge eat, or hoard food? Has the youth ever been hospitalized for eating related issues?*

0	No evidence of any problems related to eating.
1	History, suspicion, or mild level of need regarding eating minimal impairment in functioning. This could include some preoccupation with weight or calorie intake. Youth of normal weight or below normal weight who are preoccupied with their body size or type would be rated here. This could also include some binge eating patterns.
2	Moderate problems with eating that impair functioning in at least one life domain. Youth may be finicky eaters, have few food preferences and not have a clear pattern of when they eat. They may spit food or overeat or may have problems with oral motor control.
3	Severe problems with eating, either in the mechanics of eating or with respect to food preferences, are present and are putting the youth at risk developmentally. The youth and family are very distressed and unable to overcome problems in this area.

BEN8. ANGER CONTROL

This item captures the youth's ability to identify and manage their anger when frustrated, regardless of the impulsivity component to behavior. (TIP: For concurrent ratings, consider how quickly the youth "cools down," esp. after youth receives desired response or object.)

POTENTIAL INTERVIEW QUESTIONS: *How does the youth control his/her temper? Does s/he get upset or frustrated easily? Does s/he become physically aggressive when angry? Does s/he have a hard time managing anger if someone criticizes or rejects him/her?*

0	No evidence of developmentally inappropriate anger control problems.
1	Mild problems with controlling anger. S/he may sometimes become verbally aggressive when frustrated. Peers and family members are aware of and may attempt to avoid stimulating angry outbursts.
2	Moderate anger control problems, getting him/her in significant trouble with peers, family, and/or school. This level may be associated with some physical violence. Others are likely quite aware of anger potential.
3	Severe anger control problems. His/her temper is likely associated with frequent fighting that is often physical. Others likely fear him/her.

BEN9. ATTACHMENT DIFFICULTIES

This item describes the youth's ability to form secure, age-appropriate emotional bonds with important others, display appropriate boundaries in their interactions with others (e.g., lack of clinginess, distancing), and appropriately differentiate their interactions with close others versus strangers. This item should be rated within the context of developmental appropriateness and the youth's significant relationships, including caregiver relationships and peer relationships. Social impairment due solely to developmental disorder or delay should NOT be rated here.

0	No evidence of attachment problems. Youth exhibits age-appropriate emotional bonds with caregiver(s) and peers.
1	Mild problems with attachment. There is some evidence of insecurity in the youth-caregiver relationship. Youth may have minor difficulties with appropriate physical/emotional boundaries with others.
2	Moderate problems with attachment. Youth may have ongoing difficulties with separation, may consistently avoid contact with caregivers and peers, and may have ongoing difficulties with physical or emotional boundaries with others.
3	Severe problems with attachment. Youth is unable to form attachment relationships with others (e.g., chronic dismissive/avoidant/detached behavior) OR youth presents with diffuse emotional/physical boundaries leading to indiscriminate attachment with others. Youth is considered at ongoing risk due to the nature of attachment behaviors. A youth who meets the criteria for Reactive Attachment Disorder (RAD) in DSM would be rated here. Youth may have experienced significant early separation from or loss of caregiver, or have experienced chronic inadequate care from early caregivers.

BEN10. ADJUSTMENT TO TRAUMA

This item covers the youth's reaction to any of a variety of traumatic experiences -- such as emotional, physical, or sexual abuse, separation from family members, witnessing violence, or the victimization or murder of family members or close friends. This dimension covers both adjustment disorders and posttraumatic stress disorder from DSM-IV. Behaviors which might indicate trauma reactions include anxiousness/hyper-vigilance, regression to behavior of younger ages (e.g., toileting problems, babyish speech, failure to engage in self-feeding, bathing, and other self-care), appetite disruption, withdrawal of interest from pleasurable activities, and other signs of emotional dysregulation after significant life events.

POTENTIAL INTERVIEW QUESTIONS: *Has youth experienced a traumatic event? Does s/he experience frequent nightmares? Is s/he troubled by flashbacks? Is s/he unusually afraid of being alone, or of participating in normal activities?*

0	No evidence of problems associated with traumatic life events.
1	History, suspicion, or mild level of need regarding adjustment to trauma. Youth may have an adjustment disorder or other reaction that might ease with the passage of time. Or youth may be recovering from a more extreme reaction to a traumatic experience.
2	Marked adjustment problems associated with traumatic experiences. Youth may have nightmares or other notable symptoms of Adjustment Disorder or Acute Stress Disorder. Adjustment is interfering with functioning in at least one life domain.
3	Youth has post-traumatic stress difficulties as a result of traumatic experience. Symptoms may include intrusive thoughts, hyper-vigilance, constant anxiety, and other common symptoms of Post Traumatic Stress Disorder (PTSD).

CHILD RISK BEHAVIORS

To what degree is the youth a danger to self and others?

For **Risk Behaviors**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

CRB1. SUICIDE RISK

This rating describes the presence of thoughts or behaviors aimed at taking one's life. This item rates overt and covert thoughts and efforts on the part of an individual to end his/her life. A rating of 2 or 3 would indicate the need for a safety plan.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever talked about a wish or plan to die or to kill him/herself? Has s/he ever tried to commit suicide?*

0	No evidence or history of suicidal or self-harming behaviors that are life-threatening.
1	History or suspicion of suicidal ideation or gesture, but no suicide attempts during the past 30 days.
2	Recent suicidal ideation or gesture, but not in past 24 hours. Self-harming behaviors that are life-threatening in the past 30 days (including today) without suicidal ideation or intent would be rated here.
3	Current suicidal ideation, intent, and/or attempt.

CRB2. SELF-INJURIOUS BEHAVIOR (for self-soothing)

This rating includes repetitive physically harmful behavior that generally serves a self-soothing function for the youth and could exist in the absence of suicidal intent. Rubbing, burning, face slapping, head banging against surfaces, carving, and cutting on the arms or legs would be common examples of self-mutilation behavior. Giving oneself tattoos also would be an example. Repeatedly piercing one's skin is another example. Professional tattoos or body piercing would not be classified as self-mutilation.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever talked about a wish or plan to hurt him/herself? Does the youth ever purposely hurt him/herself (e.g. cutting)?*

0	No evidence of self-injurious behavior.
1	History or suspicion of self-injurious behavior.
2	Engaged in self-injurious behavior that <i>does not require medical attention</i> .
3	Engaged in self-injurious behavior that <i>requires medical attention</i> .

CRB3. RECKLESS BEHAVIOR (without intent to harm self or others)

This rating includes reckless and dangerous behaviors that, while not intended to harm self or others, place the youth or others at some jeopardy. These behaviors could include dangerous thrill-seeking and other stunts for the sake of distraction or entertainment. Suicidal or self-injurious behavior is NOT rated here. (Please note that this rating is also related to Judgment/Decision-Making rating.)

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever talked about or acted in a way that might be dangerous to him/herself (e.g., reckless behavior such as subway surfing, riding on top of cars, reckless driving, climbing bridges, promiscuity)?*

0	No evidence of behaviors that place the youth at risk of physical harm.
1	History, suspicion, or mild level of reckless and risk-taking behavior that places youth at risk of physical harm.
2	Engaged in reckless behavior or intentional risk-taking behavior that places him/her in danger of <i>physical harm</i> .
3	Engaged in reckless behavior or intentional risk-taking behavior that places him/her at immediate risk of <i>death</i> .

CRB4. DANGER TO OTHERS (with intent to harm)

This item rates the youth's violent or aggressive behavior with the intention cause significant bodily harm to others. This rating includes actual and threatened violence, beyond normative displays (e.g., boys pushing each other around to say "hello" without intent to harm). Imagined violence (e.g., drawings, lists of potential targets for violence), when extreme, may be rated here. Homicidal ideation would be rated here. A rating of 2 or 3 would indicate the need for a safety plan.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever injured another person on purpose? Does s/he get into physical fights? Has the youth ever threatened to kill or seriously injure another person?*

0	No evidence or history of aggressive behaviors towards others (including people and animals).
1	History of aggressive behavior or verbal aggression towards others.
2	Recent aggressive or threatening behavior (e.g., homicidal ideation, physically harmful aggression, or dangerous fire setting) but not within past 24 hours.
3	Frequent or dangerous (significant harm) level of aggression to others. Youth is an immediate risk to others.

CRB5. SEXUAL AGGRESSION

Sexually abusive behavior includes both aggressive sexual behavior and sexual behavior in which youth takes advantage of a younger or less powerful youth through seduction, trickery, bribery or force.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever been accused of being sexually aggressive with another youth? What happened after that?*

0	No evidence of problems with sexual behavior in the past year.
1	History or suspicion of sexual aggression or mild problems of sexually abusive behavior. For example, occasional inappropriate sexually aggressive/harassing language or behavior.
2	Moderate problems with sexually abusive behavior, For example, frequent inappropriate sexual behavior. Frequent disrobing would be rated here only if it was sexually provocative. Frequent inappropriate touching would be rated here.
3	Severe problems with sexually abusive behavior. This would include the rape or sexual abuse of another person involving sexual penetration and other sexual acts.

CRB6. SEXUALLY REACTIVE BEHAVIORS

Sexually reactive behavior includes both age-inappropriate sexualized behaviors that may place a youth at risk for victimization or risky sexual practices. The primary distinction between sexual aggression and sexually reactive behaviors is that youth with sexually reactive behaviors target peers or older/more powerful others.

0	No evidence of problems with sexually reactive behaviors or high-risk sexual behaviors.
1	History, suspicion, or some evidence of sexually reactive behavior. Youth may exhibit occasional inappropriate sexual language or behavior, flirts when age-inappropriate, or engages in unprotected sex with single partner. This behavior does not place youth at great risk. A history of sexually provocative behavior would be rated here.
2	Moderate problems with sexually reactive behavior that place youth at some risk. Youth may exhibit more frequent sexually provocative behaviors in a manner that impairs functioning, engage in promiscuous sexual behaviors or have unprotected sex with multiple partners.
3	Severe problems with sexually reactive behaviors. Youth exhibits sexual behaviors that place youth or others at immediate risk.

CRB7. RUNAWAY

In general, to classify as a runaway or elopement, the youth is gone overnight or very late into the night.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever run away from home, school or any other place? If so, where did s/he go? How long did s/he stay away? How did you find her/him? Did s/he ever threaten to run away?*

0	No evidence of running away or elopement from the present living situation.
1	History or suspicion of runaway behavior. This rating includes youth who has expressed ideation about eloping from present living situation or treatment. Youth may have threatened running away on one or more occasions or have a history (lifetime) of running away but not in the past year.
2	Youth has run away from home once or run away from one treatment setting within the past year. Youth might have run away to home (parental or relative) in the past year from a treatment setting.
3	Youth has run away from home and/or treatment settings within the last 7 days or run away from home and/or treatment setting for two or more overnight stays during the past 30 days. Destination is NOT a return to home of parent or relative.

CRB8. DELINQUENT BEHAVIOR

This rating includes both criminal behavior and status offenses that may result from youth failing to follow required behavioral standards (e.g., truancy). These behaviors include those known beyond court-involvement. Sexual offenses should be included as criminal behavior. Substance use should NOT be counted here.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth been involved in any delinquent activities including truancy and curfew violations? Has the youth ever been arrested?*

0	No evidence or no history of criminal or delinquent behavior.
1	History or suspicion of criminal or delinquent behavior but none in the past 30 days. Status offenses in the past 30 days would be rated here.
2	Moderate level of criminal activity including a high likelihood of crimes committed in the past 30 days. Examples would include vandalism, shoplifting, etc.
3	Severe level of criminal or delinquent activity in the past 30 days. Examples would include car theft, residential burglary, gang involvement, etc.

CRB9. FIRE-SETTING

This item refers to behavior involving the intentional setting of fires that might be dangerous to the youth or others. This includes both malicious and non-malicious fire-setting. This does NOT include the use of candles or incense or matches to smoke or accidental fire-setting.

POTENTIAL INTERVIEW QUESTIONS: *Has the youth ever played with matches or set a fire? Did the fire-setting behavior destroy property or endanger the lives of others?*

0	No evidence or history of fire-setting behavior.
1	History or fire-setting but not in past six months. History of malicious fire-setting might warrant a rating here for longer than six months.
2	Recent fire-setting behavior (in past six months) but not of the type that has endangered the lives of others (e.g., playing with matches) or repeated fire-setting behavior over a period of at least two years, even if not in the past six months.
3	Acute threat of fire-setting. Youth has set fire that endangered the lives of others (e.g., attempting to burn down a house).

CRB10. INTENTIONAL MISBEHAVIOR (i.e., sanction-seeking behavior)

This rating describes obnoxious social behaviors that a youth engages in to intentionally force adults to sanction him/her. In other words, he/she is trying to get caught usually for some secondary gain (e.g., avoidance of adverse stimulus, attention, "cry for help").

POTENTIAL INTERVIEW QUESTIONS: *Does the youth ever intentionally do or say things to upset others? Has the youth sworn at someone or done other behavior that was insulting, rude, or obnoxious? Does the youth seem to purposely get in trouble by making you or other adults angry with them?*

0	No evidence of intentional misbehavior.
1	Mild level of problematic intentional misbehavior. This might include occasionally inappropriate social behavior that forces adults to sanction the youth. Infrequent inappropriate comments to strangers or unusual behavior in social settings might be included at this level.
2	Moderate level of problematic intentional misbehavior. Behavior is causing problems in the youth's life. Youth may be intentionally getting in trouble in school or at home.
3	Severe level of problematic intentional misbehaviors. This would be indicated by frequent seriously inappropriate behavior that force adults to seriously and/or repeatedly sanction the youth. Social behaviors are sufficiently severe that they place the youth at risk of significant sanctions (e.g. expulsion, removal from the community).

CRB11. BULLYING

Bullying is a pattern of behavior in which the youth intentionally torments others in physical, verbal, or psychological ways. Bullying can range from hitting, shoving, name-calling, threats, and mocking to extorting money and treasured possessions; it can also include shunning others and spreading rumors about targets. Bullies might also use email, chat rooms, instant messages, social networking websites, and text messages to taunt others or hurt their feelings. This item describes the history and current risk of the youth bullying others.

0	No evidence that youth has ever engaged in bullying at school or in the community.
1	History or suspicion of bullying, or youth has been involved with groups that have bullied other youths, either in school or in the community, however, youth has not had a leadership role in these groups.
2	Youth has bullied other youth in school or in the community. Youth has either bullied others individually or led a group that bullied youth.
3	Youth has repeatedly utilized threats or actual violence to bully youth in school and/or community.

CRB12. EXPLOITED

This item is used to examine history and level of current risk for exploitation, which includes being bullied or taken advantage of by others. This item includes youth who are currently being bullied at school or in their community. It would also include youth who are exploited in other ways (e.g., sexual abuse, prostitution, inappropriate expectations based on a youth's level of development, forced to take on a parental level of responsibility, etc).

0	No evidence of recent exploitation and no significant history of victimization within the past year. The youth may have been robbed or burglarized on one or more occasions in the past, but no pattern of victimization exists. Youth is not presently at risk for re-victimization.
1	History or suspicion of exploitation. Youth has not been exploited in the past year. Youth is not presently at risk for re-victimization.
2	Recently exploited (within the past year) but is not in acute risk of re-exploitation. This might include physical or sexual abuse, significant psychological abuse by family or friend, extortion or violent crime.
3	Recently exploited and is in acute risk of re-exploitation. Examples include working as a prostitute and living in an abusive relationship.

ACCULTURATION

How much of a concern is the cultural fit between youth and environment?

For **Acculturation**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

A1. LANGUAGE

This item includes both spoken and sign language. A '2' or '3' indicates need for an interpreter appropriate for necessary proceedings.

POTENTIAL INTERVIEW QUESTIONS: *Do the youth or significant family members have any difficulty communicating (either because English is not their first language, or due to another communication issue such as the need to use/learn sign language)?*

0	Youth and family speak English well.
1	Youth and family speak some English but potential communication problems exist due to limits on vocabulary or understanding of the nuances of the language.
2	Youth and/or significant family members do not speak English. Translator or native language speaker is needed for successful intervention but a qualified individual(s) can be identified within natural supports.
3	Youth and/or significant family members do not speak English. Translator or native language speaker is needed for successful intervention and no such individual is available from among natural supports.

A2. CULTURAL IDENTITY

Cultural identity refers to the youth's view of his/herself as belonging to a specific cultural group. This cultural group may be defined by a number of factors including race, religion, ethnicity, geography, or lifestyle.

POTENTIAL INTERVIEW QUESTIONS: *Does the youth have a sense of belonging to a specific cultural group? Does the youth have role models, friends, and community members who share his/her sense of culture?*

0	Youth has clear and consistent cultural identity and is connected to others who share his/her cultural identity.
1	Youth is experiencing some confusion or concern regarding cultural identity.
2	Youth has significant struggles with his/her own cultural identity. Youth may have cultural identity but is not connected with others who share this culture.
3	Youth has no cultural identity or is experiencing significant problems due to conflict regarding his/her cultural identity.

A3. GENDER / SEXUAL IDENTITY

This item refers to the youth's gender identity including transgender, heterosexual, gay/lesbian, bisexual, transsexual, etc.

0	Youth has clear and consistent gender/sexual identity and is connected to others who share or support his/her sexual identity.
1	Youth is experiencing some confusion or concern regarding gender/sexual identity.
2	Youth has significant struggles with his/her own gender/sexual identity. Youth may have gender/sexual identity but is not connected with others who are supportive.
3	Youth is experiencing significant problems due to conflict regarding his/her gender/sexual identity.

A4. RITUAL

Cultural rituals are activities and traditions that support cultural identity, including the celebration of culturally specific holidays such as Kwanza, Hanukkah, etc. Rituals also may include daily activities that are culturally specific (e.g. praying toward Mecca at specific times, eating a specific diet, access to media).

POTENTIAL INTERVIEW QUESTIONS: *Is your child able to celebrate with others (e.g., friends, family, and community members) who share their traditions and customs?*

0	Youth and family are consistently able to practice rituals consistent with their cultural identity
1	Youth and family are generally able to practice rituals consistent with their cultural identity however they sometimes experience some obstacles to the performance of these rituals.
2	Youth and family experience significant barriers and are sometimes prevented from practicing rituals consistent with their cultural identity.
3	Youth and family are unable to practice rituals consistent with their cultural identity.

TRAUMA EXPERIENCES

*These ratings are made based on **lifetime** exposure* to trauma. Perpetrators should NOT be rated here.
(Note: Definitions of trauma experiences were taken from the National Child Traumatic Stress Network (NCTSN).)*

For **Trauma Experiences**, the following rating categories are used:

- 0** indicates that there is no evidence of any trauma of this type.
- 1** indicates that exposure to this trauma type is suspected or considered mild.
- 2** indicates moderate exposure to this trauma type.
- 3** indicates severe exposure to this trauma type (often with medical and physical consequences).

TE1. SEXUAL ABUSE

This rating describes the youth's experience of sexual abuse and the impact of the abuse on youth functioning. Sexual abuse includes a wide range of sexual behaviors that take place between a youth and an older person or alternatively between a youth and another youth. Behaviors that are sexually abusive often involve bodily contact, such as sexual kissing, touching, fondling of genitals, and intercourse. However, behaviors may be sexually abusive even if they do not involve contact, such as of genital exposure ("flashing"), verbal pressure for sex, and sexual exploitation for purposes of prostitution or pornography.

0	No evidence that youth has experienced sexual abuse.
1	Suspicion that youth has experienced sexual abuse.
2	Sexual abuse. Youth might have experienced one or multiple incidences.
3	Severe sexual abuse. Youth might have experienced one severe incident or accumulated incidences (perhaps chronic) warranting this rating.

TE2. PHYSICAL ABUSE

This rating describes the youth's experience of physical abuse and the impact of the abuse on youth functioning. Physical abuse means causing or attempting to cause physical pain or injury. It can result from punching, beating, kicking, burning, or harming a child in other ways. Sometimes an injury occurs when a punishment is not appropriate for a child's age or condition. It may also include misuse of medical/chemical restraint or inappropriate sanctions.

0	No evidence that youth has experienced physical abuse.
1	Suspicion that youth has experienced physical abuse.
2	Moderate level of physical abuse and/or repeated forms of physical punishment (e.g., hitting, punching).
3	Severe and repeated physical abuse with intent to do harm and that causes sufficient physical harm to necessitate hospital treatment.

TE3. EMOTIONAL ABUSE

This rating describes the youth's experience of emotional abuse (including verbal and nonverbal) and the impact of the abuse on youth functioning. Emotional abuse encompasses ignoring, isolating, exploiting, corrupting, verbally assaulting (i.e., belittling, ridiculing, using pejorative labels), constant criticizing, terrorizing, threatening (i.e., threatening physical or sexual abuse or deprivation of life necessities), bullying, intimidating, harassing, neglecting, or rejecting (i.e., actively refusing to respond to youth needs). Emotional abuse also includes excessive, aggressive, or unreasonable demands that place expectations on a youth beyond her/his capacity.

0	No evidence that youth has experienced emotional abuse.
1	Suspicion or mild emotional abuse. For instance, youth may experience some insults or is occasionally referred to in a derogatory manner by caregivers.
2	Moderate emotional abuse. For instance, youth may be consistently denied emotional attention from caregivers, insulted or humiliated, or intentionally isolated from others.
3	Severe emotional abuse over an extended period of time (at least one year). For instance, youth is completely ignored by caregivers, or threatened/terrorized by others.

TE4. NEGLECT

This rating describes the youth's exposure to neglect and the impact of this exposure on youth functioning. Youth neglect occurs when a caregiver does not give a youth the care needed according to her/his age. Neglect may be physical (e.g., failure to provide necessary food or shelter, or lack of appropriate supervision), medical (e.g., failure to provide necessary medical or mental health treatment), educational (e.g., failure to educate a youth or attend to special education needs), and emotional (e.g., inattention to a youth's emotional needs, failure to provide psychological care, or permitting the youth to use alcohol or other drugs). Neglect also includes poor supervision for a youth, including putting her/him in the care of someone incapable of caring for youth. It can also mean abandoning a youth or expelling her/him from home.

0	No evidence that youth has experienced neglect.
1	Suspicion of or minor/occasional neglect. Youth may have been left at home alone with no adult supervision or there may be occasional failure to provide adequate supervision of youth.
2	Moderate level of neglect. This may include occasional unintended failure to provide adequate food, shelter, or clothing with corrective action.
3	Severe level of neglect, including prolonged absences by adults, without minimal supervision, and failure to provide basic necessities of life on a regular basis.

TE5. MEDICAL TRAUMA

This rating describes the youth's exposure to medical trauma and the impact of this exposure on youth functioning. Medical trauma refers to reactions that youth may have to pain, injury, and serious illness or to "invasive" medical procedures (such as surgery) or treatments (such as burn care) that are sometimes frightening.

0	No evidence that youth has experienced any medical trauma.
1	Mild medical trauma, including minor surgery (e.g., stitches, bone setting).
2	Moderate medical trauma, including major surgery or injuries requiring hospitalization.
3	Severe (i.e., life-threatening) medical trauma.

TE6. WITNESS TO FAMILY VIOLENCE

This rating describes the youth's exposure to family violence and the impact of this exposure on youth functioning. Family violence, also often referred to as domestic violence, may occur between spouses, domestic partners, romantic partners not living together, siblings, caregiver(s), sibling(s), relatives, and cohabitants. Family violence includes physical violence, sexual abuse, emotional abuse, intimidation, economic deprivation, and threats of violence.

0	No evidence that youth has witnessed family violence.
1	Suspicion that youth has been exposed to family violence. Youth might have witnessed one episode of family violence or have had mild or limited exposure to family violence.
2	Moderate family violence. Youth might have witnessed repeated episodes of family violence but no significant injuries (i.e., requiring emergency medical attention) have been witnessed.
3	Severe family violence. Youth might have witnessed repeated and severe episodes of family violence or has had to intervene in episodes of family violence. Significant injuries have occurred and have been witnessed by the youth as a direct result of the violence.

TE7. COMMUNITY VIOLENCE

This rating describes the youth's exposure to community violence and the impact of this exposure on youth functioning. Community violence includes predatory violence (e.g., robbery) and violence that comes from personal conflicts between people who are not family members. It may include brutal acts such as shootings, rapes, stabbings, and beatings. Youth may experience trauma as victims or witnesses.

0	No evidence that youth has witnessed or experienced violence in the community.
1	Youth has witnessed occasional fighting or other forms of violence in the community. Youth has <u>not</u> been directly impacted by the community violence (i.e., violence not directed at self, family, or friends) and exposure has been limited.
2	Youth has witnessed the significant injury of others in his/her community, or has had friends/family members injured as a result of violence or criminal activity in the community, or is the direct victim of violence that was not life-threatening, or has witnessed/experienced chronic or ongoing community violence.
3	Youth has witnessed or experienced the death of another person in his/her community as a result of violence, or is the direct victim of violence in the community that was life-threatening, or has experienced chronic/ongoing impact as a result of community violence (e.g., family member injured and no longer able to work).

TE8. SCHOOL VIOLENCE

This rating describes the youth's exposure to school violence and the impact of this exposure on youth functioning. School violence includes fatal and nonfatal student or teacher victimization, threats to or injury of students, fights at school, and students carrying weapons to school.

0	No evidence that youth has witnessed violence in the school setting.
1	Youth has witnessed occasional fighting or other forms of violence in the school setting. Youth has <u>not</u> been directly impacted by the violence (i.e., violence not directed at self or close friends) and exposure has been limited.
2	Youth has witnessed the significant injury of others in his/her school setting, or has had friends injured as a result of violence or criminal activity in the school setting, or has directly experienced violence in the school setting leading to minor injury, or has witnessed ongoing/chronic violence in the school setting.
3	Youth has witnessed the death of another person in his/her school setting, or has had friends who were seriously injured as a result of violence or criminal activity in the school setting, or has directly experienced violence in the school setting leading to significant injury or lasting impact.

TE9. NATURAL OR MAN-MADE DISASTERS

*This rating describes the youth's exposure to either natural or man-made disasters and the impact of this exposure on youth functioning. **Natural disasters** may include hurricanes, floods, tornadoes, earthquakes, brush fires, tsunami, typhoon, avalanche, blizzard, mudslide, volcanic eruption, cyclone, and wildfire. Other more minor natural occurrences in this category include heat waves, droughts, extreme precipitation, and hail storms. **Man-made disasters** consist of a broad category of life events, which can cause a traumatic response, both for direct and indirect victims. They might include transportation accidents and crashes (e.g., airplane, train, automobile), bridge/mine collapse, explosions, and energy/chemical containment failures. Factors to consider in disaster trauma include death or injury of loved one or self, home/habitat destruction, financial loss, and displacement from family or friends or community.*

0	No evidence that youth has been exposed to natural or man-made disasters.
1	Youth has been exposed to disasters second-hand (i.e., on television, hearing others discuss disasters). This would include second-hand exposure to natural disasters, such as a fire or earthquake or man-made disaster, including car accident, plane crashes, or bombings.
2	Youth has been directly exposed to a disaster or witnessed the impact of a disaster on a family member or friend. For instance, a youth may have observed a caregiver who has been injured in a car accident or has watched his neighbor's house burn down.
3	Youth has been directly exposed to a disaster that caused significant harm or death to a loved one or there is an ongoing impact or life disruption due to the disaster (e.g., house burns down, caregiver loses job).

TE10. WAR-AFFECTED

This rating describes the youth's direct exposure to war, political violence, or torture and the impact of this exposure on youth functioning. This type of trauma can be the result of living in a region affected by bombing, shooting, or looting, as well as forced displacement to a new home due to political reasons. Some young refugees have served as soldiers, guerrillas, or other combatants in their home countries, and their traumatic experiences may closely resemble those of combat veterans. Violence or trauma related to terrorism is not included here.

0	No evidence that youth has been exposed to war, political violence, or torture.
1	Youth did not live in war-affected region or refugee camp, but family was affected by war. Family members directly related to the youth may have been exposed to war, political violence, or torture; family may have been forcibly displaced due to the war, or both. This does not include youth who have lost one or both parents during the war.
2	Youth has been affected by war or political violence. S/he may have witnessed others being injured in the war, may have family members who were hurt or killed in the war, and may have lived in an area where bombings or fighting took place. Youth may have lost one or both parents during the war or one or both parents may be so physically or psychologically disabled from war so that they are not able to provide adequate caretaking of youth. Youth may have spent extended amount of time in refugee camp.
3	Youth has experienced the direct affects of war. Youth may have feared for their own life during war due to bombings, shelling, very near to them. They may have been directly injured, tortured or kidnapped. Some may have served as soldiers, guerrillas, or other combatants in their home countries.

TE11. TERRORISM-AFFECTED

This rating describes the degree to which a youth has been affected by terrorism. Terrorism is defined as "the calculated use of violence or the threat of violence to inculcate fear, intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious, or ideological." Terrorism includes attacks by individuals acting in isolation (e.g., sniper attacks) as well as attacks by groups or people acting for groups.

0	No evidence that youth has been affected by terrorism or terrorist activities.
1	Youth's community has experienced an act of terrorism, but the youth was not directly impacted by the violence (i.e., youth lives close enough to site of terrorism that they may have visited before or youth recognized the location when seen on TV, but youth's family and neighborhood infrastructure was not directly affected). Exposure has been limited to pictures on television.
2	Youth has been affected by terrorism within his/her community, but did not directly witness the attack. Youth may live near the area where attack occurred and be accustomed to visiting regularly in the past, infrastructure of youth's daily life may be disrupted due to attack (e.g. utilities or school), and youth may see signs of the attack in neighborhood (e.g., destroyed building). Youth may know people who were injured in the attack.
3	Youth has witnessed the death of another person in a terrorist attack, or has had friends or family members seriously injured as a result of terrorism, or has directly been injured by terrorism leading to significant injury or lasting impact.

TE12. WITNESS/VICTIM TO CRIMINAL ACTIVITY

This rating describes the degree of severity of exposure to criminal activity.

0	No evidence that youth has been victimized via or witnessed significant criminal activity.
1	Youth is a witness of significant criminal activity.
2	Youth is a direct victim of criminal activity or witnessed the victimization of a family or friend.
3	Youth is a victim of criminal activity that was life-threatening or caused significant physical harm or youth witnessed the death of a loved one.

TRAUMA STRESS SYMPTOMS

These ratings describe a range of reactions that youth may exhibit to any of a variety of traumatic experiences from youth abuse and neglect to community violence to disasters.

For **Trauma Stress Symptoms**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

TSS1. TRAUMATIC GRIEF/SEPARATION

This rating describes the level of traumatic grief due to death or loss or separation from significant caregivers.

0	There is no evidence that youth has experienced traumatic grief or separation from significant caregivers.
1	Youth is experiencing some level of traumatic grief due to death or loss of a significant person or distress from caregiver separation in a manner that is appropriate given the recent nature of loss or separation.
2	Youth is experiencing a moderate level of traumatic grief or difficulties with separation in a manner that impairs function in certain but not all areas. This could include withdrawal or isolation from others.
3	Youth is experiencing significant traumatic grief or separation reactions. Youth exhibits impaired functioning across several areas (e.g., interpersonal relationships, school) for a significant period of time following the loss or separation.

TSS2. RE-EXPERIENCING

These symptoms consist of difficulties with intrusive memories or reminders of traumatic events, including nightmares, flashbacks, intense reliving of the events, and repetitive play with themes of specific traumatic experiences. These symptoms are part of the DSM-IV criteria for PTSD.

0	This rating is given to a youth with no evidence of intrusive symptoms.
1	This rating is given to a youth with some problems with intrusions, including occasional nightmares about traumatic events.
2	This rating is given to a youth with moderate difficulties with intrusive symptoms. This youth may have more recurrent frightening dreams with or without recognizable content or recurrent distressing thoughts, images, perceptions or memories of traumatic events. This youth may exhibit trauma-specific reenactments through repetitive play with themes of trauma or intense physiological reactions at exposure to traumatic cues.
3	This rating is given to a youth with severe intrusive symptoms. Youth may exhibit trauma-specific reenactments that include sexually or physically traumatizing other youth or sexual play with adults. Youth may also exhibit persistent flashbacks, illusions or hallucinations that make it difficult for the youth to function.

TSS3. AVOIDANCE

These symptoms include efforts to avoid stimuli associated with traumatic experiences. These symptoms are part of the DSM-IV criteria for PTSD.

0	This rating is given to a youth with no evidence of avoidance symptoms.
1	This rating is given to a youth who exhibits some problems with avoidance. Youth may exhibit one primary avoidant symptom, including efforts to try and avoid thoughts, feelings or conversations associated with the trauma.
2	This rating is given to a youth with moderate symptoms of avoidance. In addition to avoiding thoughts or feelings associated with the trauma, youth may also avoid activities, places, or people that arouse recollections of the trauma.
3	This rating is given to a youth who exhibits significant or multiple avoidant symptoms. Youth may avoid thoughts and feelings as well as situations and people associated with the trauma and have an inability to recall important aspects of the trauma.

TSS4. NUMBING

These symptoms include numbing responses that are part of the DSM-IV criteria for PTSD. These responses are not present before the trauma.

0	This rating is given to a youth with no evidence of numbing responses.
1	This rating is given to a youth who exhibits some problems with numbing. Youth may have a restricted range of affect or an inability to express or experience certain emotions (e.g., anger or sadness).
2	This rating is given to a youth with moderate difficulties with numbing responses. Youth may have a blunted or flat emotional state or have difficulty experiencing intense emotions or feel consistently detached or estranged from others following the traumatic experience.
3	This rating is given to a youth with significant numbing responses or multiple symptoms of numbing. Youth may have a markedly diminished interest or participation in significant activities and a sense of a foreshortened future.

TSS5. AFFECT DYSREGULATION

These symptoms include difficulties modulating or expressing emotions, intense fear or helplessness, difficulties regulating sleep/wake cycle, and inability to fully engage in activities.

0	This rating is given to a youth with no difficulties regulating emotional responses. Emotional responses are appropriate to the situation.
1	This rating is given to a youth with some minor difficulties with affect regulation. Youth could have some difficulty tolerating intense emotions and become somewhat jumpy or irritable, in response to emotionally charged stimuli or more watchful or hyper-vigilant in general. Youth may have some difficulty sustaining involvement in activities for any length of time.
2	This rating is given to a youth with moderate problems with affect regulation. Youth may be unable to modulate emotional responses. Youth may exhibit marked shifts in emotional responses (i.e., from sadness to irritability to anxiety) or have contained emotions with a tendency to lose control of emotions at various points (i.e., normally restricted affect punctuated by outbursts of anger or sadness). Youth may also exhibit persistent anxiety, intense fear or helplessness, or lethargy/loss of motivation.
3	This rating is given to a youth with severe problems with highly dysregulated affect. Youth may have more rapid shifts in mood and an inability to modulate emotional responses (feeling out of control of their emotions). Youth may also exhibit tightly contained emotions with intense outbursts under stress. Alternately, youth may be characterized by extreme lethargy, loss of motivation or drive, and no ability to concentrate or sustain engagement in activities (i.e., emotionally "shut down").

TSS6. DISSOCIATION

Symptoms included in this dimension are daydreaming, spacing/blanking out, forgetfulness, emotional numbing, fragmentation, detachment, and rapid changes in personality often associated with traumatic experiences. This dimension may be used to rate dissociative disorders (e.g., Dissociative Disorder NOS, Dissociative Identity Disorder) but can also exist when other diagnoses are primary (e.g., PTSD, depression).

0	This rating is given to a youth with no evidence of dissociation.
1	This rating is given to a youth with minor dissociative problems, including some emotional numbing, avoidance or detachment, and some difficulty with forgetfulness, daydreaming, spacing/blanking out.
2	This rating is given to a youth with a moderate level of dissociation. This can include amnesia for traumatic experiences or inconsistent memory for trauma (e.g., remembers in one context but not another), more persistent or perplexing difficulties with forgetfulness (e.g., loses things easily, forgets basic information), frequent daydreaming or trance-like behavior, depersonalization and/or derealization. This rating would be used for someone who meets criteria for Dissociative Disorder NOS or another diagnosis that is specified "with dissociative features."
3	This rating is given to a youth with severe dissociative disturbance. This can include significant memory difficulties associated with trauma that also impede day to day functioning. Youth is frequently forgetful or confused about things he/she should know about (e.g., no memory for activities or whereabouts of previous day or hours). Youth shows rapid changes in personality or evidence of alternate personalities. Youth who meets criteria for Dissociative Identity Disorder or a more severe level of Dissociative Disorder NOS would be rated here.

CAREGIVER NEEDS AND STRENGTHS (PERMANENCY PLAN & CURRENT)

Caregiver ratings should be completed by household. If multiple households are involved in the permanency planning, then this section should be completed once for each household under consideration.

For **Caregiver Needs & Strengths** the following definitions and action levels apply:

- 0** indicates an area where there is no evidence of any needs. This is strength
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

CNS1. SUPERVISION

This rating is used to determine the caregiver's capacity to provide the level of monitoring and discipline needed by the youth.

POTENTIAL INTERVIEW QUESTIONS: *How do you feel about your ability to keep an eye on and discipline your child/children? Do you think you might need some help with these issues?*

0	This rating is used to indicate a caregiver circumstance in which supervision and monitoring are appropriate and functioning well.
1	This level indicates a caregiver circumstance in which supervision is generally adequate but inconsistent. This may include a caregiving situation in which one member of the caregiving team is capable of appropriate monitoring and supervision, but others are not capable or not consistently available.
2	This level indicates a caregiver circumstance in which appropriate supervision and monitoring are very inconsistent and frequently absent.
3	This level indicates a caregiver circumstance in which appropriate supervision and monitoring are nearly always absent or inappropriate.

CNS2. INVOLVEMENT WITH CARE

This rating should be based on the level of involvement the caregiver(s) has in the planning and provision of youth welfare and related services.

POTENTIAL INTERVIEW QUESTIONS: *How do you feel about being involved in services for your child? Do you feel comfortable being an advocate? Would you like any help to become more involved?*

0	This level indicates a caregiver(s) who is <i>actively involved</i> in the planning and/or implementation of services and is able to be an <i>effective advocate</i> on behalf of the youth.
1	This level indicates a caregiver(s) who is <i>consistently involved</i> in the planning and/or implementation of services for the youth but is <i>not an active advocate</i> on behalf of the youth.
2	This level indicates a caregiver(s) who is <i>minimally involved</i> in the care of the youth. In the case of the Permanency Plan caregiver, the caregiver may visit individual when in out-of-home placement, but does not become involved in service planning and implementation.
3	This level indicates a caregiver(s) who is <i>uninvolved</i> with the care of the youth. In the case of the Permanency Plan caregiver, the caregiver may want individual out of the home or fails to visit the youth when the youth is in residential placement.

CNS3. KNOWLEDGE

This rating should be based on caregiver's knowledge of the specific strengths of the youth and any problems experienced by the youth and their ability to understand the rationale for the treatment or management of these problems.

POTENTIAL INTERVIEW QUESTIONS: *Do you feel comfortable with what you know about your child's needs? Have professionals told you things about your child and you didn't understand what they were trying to say? Are there areas that you feel you would like to know more?*

0	This level indicates that the present caregiver is fully knowledgeable about the youth's psychological strengths and weaknesses, talents and limitations.
1	This level indicates that the present caregiver, while being generally knowledgeable about the youth, has some mild deficits in knowledge or understanding of either the youth's psychological condition or his/her talents, skills and assets.
2	This level indicates that the caregiver does not know or understand the youth well and that significant deficits exist in the caregiver's ability to relate to the youth's problems and strengths.
3	This level indicates that the present caregiver has little or no understanding of the youth's current condition. The placement is unable to cope with the youth given his/her status at the time, not because of the needs of the youth but because the caregiver does not understand or accept the situation.

CNS4. ORGANIZATION

This rating should be based on the ability of the caregiver to participate in or direct the organization of the household, services, and related activities (e.g., returning phone calls, getting to appointments and managing a schedule).

POTENTIAL INTERVIEW QUESTIONS: *Do you think you need or want help with managing your home? Do you have difficulty getting to appointments, managing a schedule?*

0	Caregiver(s) is well organized and efficient.
1	Caregiver(s) has minimal difficulties with organizing or maintaining household to support needed services. For example, may be forgetful about appointments or occasionally fails to call back case manager or other involved individuals.
2	Caregiver(s) has moderate difficulty organizing or maintaining household to support needed services.
3	Caregiver(s) is unable to organize household to support needed services.

CNS5. RESOURCES

This item refers to the financial and social assets (extended family) and resources that the caregiver(s) can bring to bear in addressing the multiple needs of the youth and family.

POTENTIAL INTERVIEW QUESTIONS: *Do you have enough of what you need to take care of your family's needs? Do you have family members or friends who can help you when you need it?*

0	Caregiver(s) has sufficient resources so that there are few limitations on what can be provided for the youth.
1	Caregiver(s) has the necessary resources to help address the youth's major and basic needs but those resources might be stretched.
2	Caregiver(s) has limited resources (e.g. a grandmother living in same town who is sometimes available to watch the youth).
3	Caregiver(s) has severely limited resources that are available to assist in the care and treatment of the youth.

CNS6. ATTACHMENT DIFFICULTIES

This item should be rated within the context of the caregiver's significant relationships with youth.

POTENTIAL INTERVIEW QUESTIONS:

0	No evidence of attachment problems. Caregiver-youth relationship is characterized by mutual satisfaction of needs and youth's development of a sense of security and trust. Caregiver appears able to respond to youth cues in a consistent, appropriate manner, and youth seeks age-appropriate contact with caregiver for both nurturing and safety needs.
1	Mild problems with attachment. There is some evidence of insecurity in the caregiver-youth relationship. Caregiver may at times have difficulty accurately reading youth's bids for attention and nurturance; may be inconsistent in response; or may be occasionally intrusive. Caregiver may have mild problems with separation (e.g., anxious behaviors in the absence of obvious cues of danger) or may avoid contact with youth in an inappropriate way. Caregiver may have minor difficulties with appropriate emotional boundaries with youth they have cared for.
2	Moderate problems with attachment. Attachment relationship is marked by sufficient difficulty as to require intervention. Caregiver may consistently misinterpret youth cues, act in an overly intrusive way, or ignore/avoid youth bids for attention/nurturance. Caregiver may have ongoing difficulties with separation, may consistently avoid contact with youth, and may have ongoing difficulties with emotional boundaries with other youth they have cared for.
3	Severe problems with attachment. Caregiver is unable to form attachment relationships with others (e.g., chronic dismissive/avoidant/detached behavior in care giving relationships) OR caregiver presents diffuse emotional/physical boundaries leading to indiscriminate attachment with others. Caregiver is considered an ongoing risk due to the nature of his/her attachment behaviors. A caregiver who meets the criteria for an Attachment Disorder in DSM-IV would be rated here. Caregiver may have experienced significant early separation from or loss from their caregiver, or have experienced chronic inadequate care from early caregivers, or caregiver may have individual vulnerabilities (e.g., mental health, developmental disabilities) that interfere with the formation of positive attachment relationships.

CNS7. ACCESSIBILITY TO CHILD CARE SERVICES

This item refers to baby sitting and day care services. If the youth is sufficiently independent to not need these services, then rate the caregiver as '0' on this need.

POTENTIAL INTERVIEW QUESTIONS:

0	Caregiver has access to sufficient child care services.
1	Caregiver has limited access to child care services. Needs are met minimally by existing, available services.
2	Caregiver has limited access or access to limited child care services. Current services do not meet the caregiver's needs.
3	Caregiver has no access to child care services.

CNS8. RESIDENTIAL STABILITY

This item rates the caregivers' current and likely future housing circumstances.

POTENTIAL INTERVIEW QUESTIONS: *Is your current housing situation stable? Do you have any concerns that you may have to move in the near future? Have you lost your housing?*

0	This rating indicates a family/caregiver in stable housing with no known risks of instability.
1	This rating indicates a family/caregiver that is currently in stable housing but there are significant risks of housing disruption (e.g., loss of job).
2	This rating indicates a family/caregiver that has moved frequently or has very unstable housing.
3	This rating indicates a family/caregiver that is currently homeless.

CNS9. FAMILY STRESS

This item describes the level of stress or burden the youth's current needs are generating in the family system.

POTENTIAL INTERVIEW QUESTIONS:

0	Caregiver able to manage the stress of youth's needs.
1	Caregiver has some problems managing the stress of youth's needs.
2	Caregiver has notable problems managing the stress of youth's needs. This stress interferes with their capacity to give care.
3	Caregiver is unable to manage the stress associated with youth's needs. This stress prevents caregiver from parenting.

CNS10. SAFETY

This rating refers to the safety of the assessed youth. It does not refer to the safety of other family or household members based on any danger presented by the assessed youth.

POTENTIAL INTERVIEW QUESTIONS: *Has the Department of Social Services ever been involved with your family? What happened that they became involved? Are they currently involved? If so what led to their involvement? Is there any current concern about the child/youth's safety from a child protection perspective?*

0	This level indicates that the present placement is as safe or safer for the youth (in his or her present condition) as could be reasonably expected.
1	This level indicates that the present placement environment presents some mild risk of neglect, exposure to adverse environments (e.g., drug use or gangs in neighborhood, etc.) but that no immediate risk is present.
2	This level indicates that the present placement environment presents a moderate level of risk to the youth, including such things as the risk of neglect or abuse or exposure to individuals who could harm the youth.
3	This level indicates that the present placement environment presents a significant risk to the well being of the youth. Risk of neglect or abuse is imminent and immediate. Individuals in the environment offer the potential of significantly harming the youth.

CNS11. PHYSICAL HEALTH

Physical health includes medical and physical challenges faced by the caregiver(s) that affects parenting.

POTENTIAL INTERVIEW QUESTIONS: *How is your health? Do you have any health problems that make it hard for you to take care of your family? Does anyone else in the family have serious physical needs? Do you help care for them?*

0	Caregiver(s) has no physical health limitations that impact assistance or attendant care.
1	Caregiver(s) has some physical health limitations that interfere with provision of assistance or attendant care.
2	Caregiver(s) has significant physical health limitations that prevent them from being able to provide some needed assistance or make attendant care difficult.
3	Caregiver(s) is physically unable to provide any needed assistance or attendant care.

CNS12. MENTAL HEALTH

This item refers to the caregiver's mental health status that affects parenting. Serious mental illness would be rated as a '2' or '3' unless the individual is in recovery.

POTENTIAL INTERVIEW QUESTIONS: *Do you have mental health needs that make parenting more difficult? Does anyone else in the family have serious mental health needs? Do you help care for them?*

0	Caregiver(s) has no mental health limitations that impact assistance or attendant care.
1	Caregiver(s) has some mental health limitations that interfere with provision of assistance or attendant care.
2	Caregiver(s) has significant mental health limitations that prevent them from being able to provide some needed assistance or make attendant care difficult.
3	Caregiver(s) is unable to provide any needed assistance or attendant care due to serious mental illness.

CNS13. SUBSTANCE USE

This item rates the caregiver's pattern of alcohol and/or drug use that affects parenting. Substance-related disorders would be rated as a '2' or '3' unless the individual is in recovery.

POTENTIAL INTERVIEW QUESTIONS: *Do you have any substance abuse needs that make parenting more difficult? Does anyone else in the family have serious substance abuse needs? Do you help care for them?*

0	Caregiver(s) has no substance-related limitations that impact assistance or attendant care. Long-term recovery would be rated here.
1	Caregiver(s) has some substance-related limitations that interfere with provision of assistance or attendant care. History and short-term recovery would be rated here.
2	Caregiver(s) has significant substance-related limitations that prevent them from being able to provide some needed assistance or make attendant care difficult.
3	Caregiver(s) is unable to provide any needed assistance or attendant care due to serious substance dependency or abuse.

CNS14. DEVELOPMENTAL (COGNITIVE DEVELOPMENT)

This item describes the caregiver's developmental status in terms of low IQ, mental retardation or other developmental disabilities that might affect parenting.

POTENTIAL INTERVIEW QUESTIONS: *Has anyone ever told you that you may have developmental problems that make parenting/caring for your child more difficult?*

0	Caregiver(s) has no developmental limitations that impact assistance or attendant care.
1	Caregiver(s) has some developmental limitations that interfere with provision of assistance or attendant care.
2	Caregiver(s) has significant developmental limitations that prevent them from being able to provide some needed assistance or make attendant care difficult.
3	Caregiver(s) is unable to provide any needed assistance or attendant care due to serious developmental disabilities.

CNS15. MARITAL/PARTNER CONFLICT

This rating describes the degree of difficulty or conflict in the caregiver relationship.

POTENTIAL INTERVIEW QUESTIONS:

0	Caregivers appear to be functioning adequately. There is no evidence of notable conflict in the caregiver relationship. Disagreements are handled in an atmosphere of mutual respect and equal power.
1	Mild to moderate level of family problems including marital difficulties and caregiver arguments. Caregivers are generally able to keep arguments to a minimum when youth is present. Occasional difficulties in conflict resolution or use of power and control by one partner over another.
2	Significant level of caregiver difficulties including frequent arguments that often escalate to verbal aggression or the use of verbal aggression by one partner to control the other. Youth often witnesses these arguments between caregivers or the use of verbal aggression by one partner to control the other.
3	Profound level of caregiver or marital violence that often escalates to mutual attacks or the use of physical aggression by one partner to control the other. These episodes may exacerbate youth's difficulties or put the youth at greater risk.

CNS16. CAREGIVER POSTTRAUMATIC REACTIONS

This rating describes posttraumatic reactions faced by caregiver(s), including emotional numbing and avoidance, nightmares and flashbacks that are related to their youth's or their own traumatic experiences.

POTENTIAL INTERVIEW QUESTIONS:

0	Caregiver has adjusted to traumatic experiences without notable posttraumatic stress reactions.
1	Caregiver has some mild adjustment problems related to their youth's or their own traumatic experiences. Caregiver may exhibit some guilt about their youth's trauma or become somewhat detached or estranged from others.
2	Caregiver has moderate adjustment difficulties related to traumatic experiences. Caregiver may have nightmares or flashbacks of the trauma.
3	Caregiver has significant adjustment difficulties associated with traumatic experiences. Symptoms might include intrusive thoughts, hypervigilance, and constant anxiety.

CNS17. CAREGIVER CRIMINAL BEHAVIOR

This item rates the criminal behavior of the caregiver(s).

POTENTIAL INTERVIEW QUESTIONS:

0	No evidence that youth's caregivers have ever engaged in criminal behavior.
1	One of youth's caregivers has history of criminal behavior but youth has not been in contact with this caregiver for at least one year.
2	One of youth's caregivers has history of criminal behavior resulting in incarceration and youth has been in contact with this caregiver in the past year.
3	Both of youth's parents have history of criminal behavior resulting in incarceration.

MODULES

MODULES SUBFORM

SUBSTANCE ABUSE MODULE

0 = no evidence of problems	1 = history, mild			
2 = moderate	3 = severe			
	0	1	2	3
Severity of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Duration of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stage of Recovery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Influences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parental Influences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Influences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SEXUAL AGGRESSION MODULE

0 = no evidence of problems	1 = history, mild			
2 = moderate	3 = severe			
	0	1	2	3
Relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Force/Threat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Age Differential	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Type of Sex Act	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Response to Accusation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Temporal Consistency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
History of Sexually Abusive Behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severity of Sexual Abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prior Treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

RUNAWAY MODULE

0 = no evidence of problems	1 = history, mild			
2 = moderate	3 = severe			
	0	1	2	3
Frequency of Running	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistency of Destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety of Destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involvement of Illegal Activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Likelihood of Return On Own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involvement With Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Realistic Expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FIRE-SETTING MODULE

0 = no evidence of problems	1 = history, mild			
2 = moderate	3 = severe			
	0	1	2	3
Seriousness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
History	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of Accelerants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intention to Harm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Response to Accusation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remorse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Likelihood of Future Fire-setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

JUVENILE JUSTICE MODULE

	# of Incidents
Age at First Offense	
Misdemeanor Referrals	
Felony Referrals	
Weapon Referrals	
Against-person misdemeanor referrals	
Against-person felony referrals	
Sexual misconduct misdemeanor referrals	
Felony sex offense referrals	
Detention	
Placement	
Escapes	
Failure to appear in court warrants	

MEDICAL / PHYSICAL MODULE

0 = no evidence of problems	1 = history, mild			
2 = moderate	3 = severe			
	0	1	2	3
Life Threat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronicity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diagnostic Complexity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Impairment in Functioning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treatment Involvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intensity of Treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organizational Complexity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SUBSTANCE ABUSE MODULE

These ratings describe the youth on the following dimensions based on their current substance use and any prior history of similar behaviors.

For **Substance Abuse**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

SU1. SEVERITY OF USE

Please rate the most recent incident.

0	Youth is currently abstinent and has maintained abstinence for at least six months.
1	Youth is currently abstinent but only in the past 30 days or youth has been abstinent for more than 30 days, but is living in an environment that makes substance use difficult.
2	Youth actively uses alcohol or drugs but not daily.
3	Youth uses alcohol and/or drugs on a daily basis.

SU2. DURATION OF USE

Please rate using time frames provided in the anchors.

0	Youth has begun use in the past year.
1	Youth has been using alcohol or drugs for at least one year but has had periods of at least 30 days when s/he did not have any use.
2	Youth has been using alcohol or drugs for at least one year (but less than five years) but not daily.
3	Youth has been using alcohol or drugs daily for more than the past year or intermittently for at least five years.

SU3. STAGE OF RECOVERY

Please rate the most recent incident.

0	Youth is in maintenance stage of recovery. Youth is abstinent and able to recognize and avoid risk factors for future alcohol or drug use.
1	Youth is actively trying to use treatment to remain abstinent.
2	Youth is in contemplation phase (i.e., recognizing a problem but not willing to take steps for recovery).
3	Youth is in denial regarding the existence of any substance use problem.

SU4. PEER INFLUENCES

Please rate the most recent incident.

0	Youth's primary peer social network does not engage in alcohol or drug use.
1	Youth has peers in her/his primary peer social network who do not engage in alcohol or drug use but has some peers who do.
2	Youth predominantly has peers who engage in alcohol or drug use, but youth is not a member of a gang.
3	Youth is a member of a peer group that consistently engages in alcohol or drug use. Youth may be a member of a gang.

SU5. PARENTAL INFLUENCES

Please rate the most recent incident.

0	There is no evidence that youth's parents have ever engaged in substance abuse.
1	One of youth's parents has history of substance abuse but not in the past year.
2	One or both of youth's parents have been intoxicated with alcohol or drugs in the presence of the youth.

3	One or both of youth's parents use alcohol or drugs with the youth.
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SU6. ENVIRONMENTAL INFLUENCES

*Please rate highest level in the **past 30 days**.*

0	No evidence that the youth's environment stimulates or exposes the youth to any alcohol or drug use.
1	Mild problems in the youth's environment that might expose the youth to alcohol or drug use.
2	Moderate problems in the youth's environment that clearly expose the youth to alcohol or drug use.
3	Severe problems in the youth's environment that stimulate the youth to engage in alcohol or drug.

SEXUAL AGGRESSION MODULE

These ratings describe the youth on the following dimensions based on their most recent sexually aggressive incident and any prior history of similar behaviors. Sexually aggressive behavior is defined as non-consenting sexual activity initiated by the abuser in which one of the following conditions apply: use or threat of physical force, age differential, power differential. A youth is only assessed on this dimension, if they were an active abuser in this form of sexual abuse of another person.

For **Sexual Aggression**, the following categories and action levels are used:

- 0** indicates an area where there is no evidence of any needs.
- 1** indicates an area that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates an area that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates an area that requires immediate or intensive action.

SA1. RELATIONSHIP

Please rate the most recent episode of sexual behavior.

0	No evidence of victimizing others. All parties in sexual activity appear to be consenting. No power differential.
1	Although parties appear to be consenting, there is a significant power differential between parties in the sexual activity with this youth being in the position of authority.
2	Youth is clearly victimizing at least one other individual with sexually abusive behavior.
3	Youth is severely victimizing at least one other individual with sexually abusive behavior. This may include physical harm that results from either the sexual behavior or physical force associated with sexual behavior.

SA2. PHYSICAL FORCE/THREAT

Please rate the highest level from the most recent episode of sexual behavior.

0	No evidence of use of any physical force or threat of force in either commission of the sex act or in attempting to hide it.
1	Evidence of use of threat of force in an attempt to discourage the victim from reporting the sex act.
2	Evidence of use of mild to moderate force in the sex act. There is some physical harm or risk of physical harm.
3	Evidence of severe physical force in commission of the sex act. Victim was harmed or at risk for physical harm from use of force.

SA3. PLANNING

Please rate the highest level from the most recent episode of sexual behavior.

0	No evidence of any planning. Sexual activity appears entirely opportunistic.
1	Some evidence of efforts to get into situations where likelihood of opportunities for sexual activity are enhanced.
2	Evidence of some planning of sex act.
3	Considerable evidence of predatory sexual behavior in which victim is identified prior to the act, and the act is premeditated.

SA4. AGE DIFFERENTIAL

Please rate the highest level from the most recent episode of sexual behavior.

0	Ages of the perpetrator and victim and/or participants essentially equivalent (less than 3 years apart).
1	Age differential between perpetrator and victim and/or participants is 3 to 4 years.
2	Age differential between perpetrator and victim at least 5 years, but perpetrator less than 13 years old.
3	Age differential between perpetrator and victim at least 5 years and perpetrator 13 years old or older.

SA5. TYPE OF SEX ACT

Please rate the highest level from the most recent episode of sexual behavior.

0	Sex act(s) involve touching or fondling only.
1	Sex act(s) involve fondling plus possible penetration with fingers or oral sex.
2	Sex act(s) involve penetration into genitalia or anus with body part.
3	Sex act involves physically dangerous penetration due to differential size or use of an object.

SA6. RESPONSE TO ACCUSATION

Please rate the highest level from the past 30 days.

0	Youth admits to behavior and expresses remorse and desire to not repeat.
1	Youth partially admits to behaviors and expresses some remorse.
2	Youth admits to behavior but does not express remorse.
3	Youth neither admits to behavior nor expresses remorse. Youth is in complete denial.

SA7. TEMPORAL CONSISTENCY

0	This level indicates a youth, who has never exhibited sexually abusive behavior or who has developed this behavior only in the past three months following a clear stressor.
1	This level indicates a youth, who has been sexually abusive during the past two years OR youth who has become sexually abusive in the past three months despite the absence of any clear stressors.
2	This level indicates a youth who has been sexually abusive for an extended period of time (i.e., more than two years), but who has had significant symptom-free periods.
3	This level indicates a youth who has been sexually abusive for an extended period of time (i.e. more than two years) without significant symptom-free periods.

SA8. HISTORY OF SEXUALLY ABUSIVE BEHAVIOR (toward others)

0	Youth has none or only one incident of sexually abusive behavior that has been identified and/or investigated.
1	Youth has two or three incidents of sexually abusive behavior that have been identified and/or investigated.
2	Youth has four to ten incidents of sexually abusive behavior that have been identified and/or investigated with more than one victim.
3	Youth has more than ten incidents of sexually abusive behavior with more than one victim? (has to be more than one?)

SA9. SEVERITY OF SEXUAL ABUSE

0	No history of any form of sexual abuse.
1	History of occasional fondling or being touched inappropriately, however not occurring on a regular basis or by someone in a caregiver capacity or suspicion of history of sexual abuse without confirming evidence.
2	This level is to indicate a moderate level of sexual abuse. This may involve a youth who has been fondled on an ongoing basis or sexually penetrated (anal or genital) once by someone not in a caregiver capacity.
3	This level is to indicate a severe level of sexual abuse involving penetration on an ongoing basis by someone either in a caregiver capacity or in close emotional relation to the youth.

SA10. PRIOR TREATMENT

0	No history of prior treatment or history of outpatient treatment with notable positive outcomes.
1	History of outpatient treatment which has had some degree of success.
2	History of residential treatment where there has been successful completion of program.
3	History of residential or outpatient treatment condition with little or no success.

RUNAWAY MODULE

These ratings describe the youth on the following dimensions based on their most recent running away incident and any prior history of similar behaviors.

For **Runaway**, the following categories and action levels are used:

- 0** indicates a dimension where there is no evidence of any needs.
- 1** indicates a dimension that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates a dimension that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates a dimension that requires immediate or intensive action.

R1. FREQUENCY OF RUNNING

0	Youth has only run away once in past year
1	Youth has run away on multiple occasions in past year.
2	Youth runs away often but not always.
3	Youth runs away at every opportunity.

R2. CONSISTENCY OF DESTINATION

0	Youth always runs away to the same location.
1	Youth generally runs away to the same location or neighborhood
2	Youth runs away to the same community but the specific locations change.
3	Youth runs away to no planned destination.

R3. SAFETY OF DESTINATION

0	Youth runs away to a safe environment that meets his/her basic needs (e.g. food, shelter).
1	Youth runs away to generally safe environments, however, they might be somewhat unstable or variable.
2	Youth runs away to generally unsafe environments that cannot meet his/her basic needs.
3	Youth runs away to very unsafe environments where the likelihood that he/she will be victimized is high.

R4. INVOLVEMENT IN ILLEGAL ACTIVITIES

0	Youth does not engage in illegal activities while on run-away beyond those involved with the running itself.
1	Youth engages in status offenses beyond those involved with the running itself while on run-away (e.g. curfew violations, underage drinking)
2	Youth engages in delinquent activities while on run-away.
3	Youth engages in dangerous delinquent activities while on run (e.g. prostitution)

R5. LIKELIHOOD OF RETURN ON OWN

0	Youth will return from run-away on his/her own without prompting.
1	Youth will return from run-away when found but not without being found.
2	Youth will make himself/herself difficult to find and/or might passively resist return once found.
3	Youth makes repeated and concerted efforts to hide so as to not be found and/or resists return.

R6. INVOLVEMENT WITH OTHERS

0	Youth runs away by self with no involvement of others. Others may discourage behavior or encourage youth to return from run-away.
1	Others enable youth running away by not discouraging youth's behavior.
2	Others involved in running away by assisting in hiding youth (helping youth to not be found.)
3	Youth actively is encouraged to run away by others. Others actively cooperate to facilitate running behavior.

R7. REALISTIC EXPECTATIONS

0	Youth has realistic expectations about the implications of his/her running away behavior.
1	Youth has reasonable expectations about the implications of his/her running away behavior but may be hoping for a somewhat 'optimistic' outcome.
2	Youth has unrealistic expectations about the implications of their running away behavior.
3	Youth has obviously false or delusional expectations about the implications of their running away behavior.

R8. PLANNING

0	Running away behavior is completely spontaneous and emotionally impulsive.
1	Running away behavior is somewhat planned but not carefully.
2	Running away behavior is planned.
3	Running away behavior is carefully planned and orchestrated to maximize likelihood of not being found.

FIRE-SETTING MODULE

These ratings describe the youth on the following dimensions based on their most recent fire-setting behavior and any prior history of similar behaviors.

For **Fire-Setting**, the following categories and action levels are used:

- 0** indicates a dimension where there is no evidence of any needs.
- 1** indicates a dimension that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates a dimension that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates a dimension that requires immediate or intensive action.

FS1. SERIOUSNESS

Please rate the most recent incident.

0	Youth has engaged in fire-setting that resulted in only minor damage (e.g. camp fire in the backyard which scorched some lawn).
1	Youth has engaged in fire-setting that resulted only in some property damage that required repair.
2	Youth has engaged in fire-setting which caused significant damage to property (e.g. burned down house).
3	Youth has engaged in fire-setting that injured self or others.

FS2. HISTORY

Please rate using time frames provided in the anchors.

0	Only one known occurrence of fire-setting behavior.
1	Youth has engaged in multiple acts of fire-setting in the past year.
2	Youth has engaged in multiple acts of fire-setting for more than one year but has had periods of at least 6 months where he/she did not engage in fire-setting behavior.
3	Youth has engaged in multiple acts of fire-setting for more than one year without any period of at least 3 months where he/she did not engage in fire-setting behavior.

FS3. PLANNING

Please rate the most recent incident.

0	No evidence of any planning. Fire-setting behavior appears opportunistic or impulsive.
1	Evidence suggests that youth places him/herself into situations where the likelihood of fire-setting behavior is enhanced.
2	Evidence of some planning of fire-setting behavior.
3	Considerable evidence of significant planning of fire-setting behavior. Behavior is clearly premeditated.

FS4. USE OF ACCELERANTS

Please rate the most recent incident.

0	No evidence of any use of accelerants (e.g., gasoline). Fire-setting involved only starters such as matches or a lighter.
1	Evidence suggests that the fire-setting involved some use of mild accelerants (e.g. sticks, paper) but no use of liquid accelerants.
2	Evidence that fire-setting involved the use of a limited amount of liquid accelerants but that some care was taken to limit the size of the fire.
3	Considerable evidence of significant use of accelerants in an effort to secure a very large and dangerous fire.

FS5. INTENTION TO HARM*Please rate the most recent incident.*

0	Youth did not intend to harm others with fire. He/she took efforts to maintain some safety.
1	Youth did not intend to harm others but took no efforts to maintain safety.
2	Youth intended to seek revenge or scare others but did not intend physical harm, only intimidation.
3	Youth intended to injure or kill others.

FS6. COMMUNITY SAFETY*Please rate highest level in the past 30 days.*

0	Youth presents no risk to the community. He/she could be unsupervised in the community.
1	Youth engages in fire-setting behavior that represents a risk to community property.
2	Youth engages in fire-setting behavior that places community residents in some danger of physical harm. This danger may be an indirect effect of the youth's behavior.
3	Youth engages in fire-setting behavior that intentionally places community members in danger of significant physical harm. Youth attempts to use fires to hurt others.

FS7. RESPONSE TO ACCUSATION*Please rate highest level in the past 30 days.*

0	Youth admits to behavior and expresses remorse and desire to not repeat.
1	Youth partially admits to behaviors and expresses some remorse.
2	Youth admits to behavior but does not express remorse.
3	Youth neither admits to behavior nor expresses remorse. Youth is in complete denial.

FS8. REMORSE*Please rate highest level in the past 30 days.*

0	Youth accepts responsibility for behavior and is truly sorry for any damage/risk caused. Youth is able to apologize directly to effected people.
1	Youth accepts responsibility for behavior and appears to be sorry for any damage/risk caused. However, youth is unable or unwilling to apologize to affected people.
2	Youth accepts some responsibility for behavior but also blames others. May experience sorrow at being caught or receiving consequences. May express sorrow/remorse but only in an attempt to reduce consequences.
3	Youth accepts no responsibility and does not appear to experience any remorse.

FS9. LIKELIHOOD OF FUTURE FIRE-SETTING*Please rate highest level in the past 30 days.*

0	Youth is unlikely to set fires in the future. Youth able and willing to exert self-control over fire-setting.
1	Youth presents mild to moderate risk of fire-setting in the future. Should be monitored but does not require ongoing treatment/intervention.
2	Youth remains at risk of fire-setting if left unsupervised. Youth struggles with self-control.
3	Youth presents a real and present danger of fire-setting in the immediate future. Youth unable or unwilling to exert self-control over fire-setting behavior.

JUVENILE JUSTICE MODULE

The Juvenile Justice Module is the Pre-Screen Risk Assessment from the Maryland Comprehensive Assessment and Service Planning (MCASP) instrument. The Pre-Screen Assessment is an evidence based tool that provides useful information on a youth's risk of re-offending. This scoring for this module is different from the rest of the CANS instrument. Instead of the rating each item using the 0-3 needs and strengths scale, each item will require a numerical response that corresponds to the total number of incidents identified by the item.

JJ1. AGE AT FIRST OFFENSE

The age at the time of the first offense for which the youth was referred to DJS. This could have been a misdemeanor or felony.

JJ2. MISDEMEANOR REFERRALS

Total number of DJS referrals in which the most serious offense was a misdemeanor.

JJ3. FELONY REFERRALS

Total number of DJS referrals in which the most serious offense was a felony.

JJ4. WEAPON REFERRALS

Total number of DJS referrals in which the most serious offense included the possession or use of a firearm or explosive.

JJ5. "AGAINST-PERSON" MISDEMEANOR REFERRALS

Total number of DJS referrals in which the most serious offense was an "against-person" misdemeanor. An "against-person" misdemeanor involves threats, force, or physical harm to another person such as assault, sex, coercion, harassment, obscene phone call, etc.

JJ6. "AGAINST-PERSON" FELONY REFERRALS

Total number of referrals for an "against-person" felony. An "against-person" felony involves force or physical harm to another person such as homicide, murder, manslaughter, assault, rape, sex, robbery, kidnapping, domestic violence, harassment, criminal mistreatment, intimidation, coercion, obscene harassing phone call, etc.

JJ7. SEXUAL MISCONDUCT MISDEMEANOR REFERRALS

Total number of DJS referrals for which the most serious offense was a sexual misconduct 4th degree misdemeanor.

JJ8. FELONY SEX OFFENSE REFERRALS

Total number of DJS referrals for a felony sex offense – first, second, or third degree.

JJ9. DETENTION

Number of times a youth served at least one day confined in detention under a detention order.

JJ10. PLACEMENT

Number of times a youth served at least one day in placement under commitment to DJS (including pending placement in a detention facility).

JJ11. ESCAPES

Total number of DJS referrals for escape from a detention facility.

JJ12. FAILURE TO APPEAR IN COURT RESULTING IN WARRANT

Total number of failures-to-appear in court that resulted in a warrant being issued. Exclude failure-to-appear warrants for non-criminal matters.

MEDICAL / PHYSICAL MODULE

These ratings describe the youth on the following dimensions based on their most recent and/or most serious medical/physical condition.

For **Medical / Physical**, the following categories and action levels are used:

- 0** indicates a dimension where there is no evidence of any needs.
- 1** indicates a dimension that requires monitoring, watchful waiting, or preventive activities.
- 2** indicates a dimension that requires action to ensure that this identified need or risk behavior is addressed.
- 3** indicates a dimension that requires immediate or intensive action.

MP1. LIFE THREAT

*Please rate highest level in the **past 30 days**.*

0	Youth's medical/physical condition has no implications for shortening his/her life.
1	Youth's medical/physical condition may shorten life, but not until later in adulthood.
2	Youth's medical/physical condition places him/her at some risk of premature death before he/she reaches adulthood.
3	Youth's medical/physical condition places him/her at imminent risk of death.

MP2. CHRONICITY

*Please rate highest level in the **past 30 days**.*

0	Youth is expected to fully recover from his/her current medical/physical condition within the next six months.
1	Youth is expected to fully recover from his/her current medical/physical condition after at least six months but less than two years.
2	Youth is expected to fully recover from his/her current medical/physical condition but not within the next two years.
3	Youth's medical/physical condition is expected to continue throughout his/her lifetime.

MP3. DIAGNOSTIC COMPLEXITY

*Please rate highest level in the **past 30 days**.*

0	The youth's medical diagnosis is clear and there is no doubt as to the correct diagnosis. Symptom presentation is clear.
1	Although there is some confidence in the accuracy of the youth's medical diagnosis, there also exists sufficient complexity in the youth's symptom presentation to raise concerns that the diagnosis may not be accurate.
2	There is substantial concern about the accuracy of the youth's medical diagnosis due to the complexity of symptom presentation.
3	At present, It is not possible to accurately diagnose the youth's medical condition(s).

MP4. EMOTIONAL RESPONSE

*Please rate highest level in the **past 30 days**.*

0	Youth is coping well with his/her medical/physical condition.
1	Youth is experiencing some emotional difficulties related to his/her medical/physical condition but these difficulties do not interfere with other areas of functioning.
2	Youth is having difficulties coping with his/her medical/physical condition. His/her emotional response is interfering with functioning in other life domains.
3	Youth is having a severe emotional response to his/her medical/physical condition that is interfering with treatment and functioning.

MP5. IMPAIRMENT IN FUNCTIONING*Please rate highest level in the past 30 days.*

0	Youth's medical/physical condition is not interfering with his/her functioning in other life domains.
1	Youth's medical/physical condition is having a limited impact on his/her functioning in at least one other life domain.
2	Youth's medical/physical condition is interfering with functioning in more than one life domain or is disabling in at least one.
3	Youth's medical/physical condition has disabled him/her in several life domains.

MP6. TREATMENT INVOLVEMENT*Please rate highest level in the past 30 days.*

0	Youth and family are actively involved in treatment.
1	Youth and/or family are generally involved in treatment but may struggle to stay consistent.
2	Youth and/or family are generally uninvolved in treatment although they are sometimes compliant with treatment recommendations.
3	Youth and/or family are currently resistant to all efforts to provide medical treatment.

MP7. FAMILY STRESS*Please rate highest level in the past 30 days.*

0	Youth's medical/physical condition is not adding any stress to the family.
1	Youth's medical/physical condition is a mild stressor on the family.
2	Youth's medical/physical condition is a stressor on the family and is interfering with healthy family functioning.
3	Youth's medical/physical condition is a severe stressor on the family and is resulting in significant functioning problems in multiple family domains.

MP8. INTENSITY OF TREATMENT*Please rate highest level in the past 30 days.*

0	Youth's medical treatment involves taking daily medication or visiting a medical professional no more than weekly.
1	Youth's medical treatment involves taking multiple medications or visiting a medical professional multiple times per week.
2	Youth's medical treatment is daily but non-invasive. Treatment can be administered by a caregiver.
3	Youth's medical treatment is daily and invasive and requires either a medical professional to administer or a well trained caregiver

MP9. ORGANIZATIONAL COMPLEXITY*Please rate highest level in the past 30 days.*

0	All medical care is provided by a single medical professional.
1	Youth's medical care is generally provided by a coordinated team of medical professionals who all work for the same organization.
2	Youth's medical care requires the collaboration of multiple medical professionals who work for more than one organization but current communication and coordination is effective.
3	Youth's medical care requires the collaboration of multiple medical professionals who work for more than one organization and problems currently exist in communication among these professionals.

Appendix B

File Number: H08-16-03

Date (mm/dd/yyyy): 08/15/2016



Université d'Ottawa **University of Ottawa**
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
John	Lyons	Social Sciences / Psychology	Supervisor
Natasha	Hudek	Social Sciences / Psychology	Student Researcher

File Number: H08-16-03

Type of Project: PhD Thesis

Title: Environmental and internal resilience in the internalizing outcomes of children in out-of-home care

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
08/15/2016	08/14/2017	Approved

Special Conditions / Comments:
N/A



Université d'Ottawa **University of Ottawa**
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: <http://www.research.uottawa.ca/ethics/forms.html>

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: <http://www.research.uottawa.ca/ethics/forms.html>

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5387 or by e-mail at: ethics@uOttawa.ca.

Signature:

Gabriel Petitti
Protocol Officer for Ethics in Research
For Daniel Lagarec, Chair of the Health Sciences and Sciences REB



December 22, 2016

Natasha Hudek
Faculty of Social Sciences
136 Jean-Jacques Lussier
Vanier Hall
Ottawa, Ontario, Canada
K1N 6N5

RE: RRB 2016-0802 – Environmental and Internal Resilience in the Internalizing Outcomes of Children in Out-of-Home Care

Dear Ms. Hudek:

The Research Review Board (RRB) of the Maryland Department of Human Resources (DHR) Social Services Administration (SSA) has reviewed the proposal submitted to the RRB on August 29, 2016, and approved by the RRB on September 28, 2016. The proposal is entitled, "Environmental and Internal Resilience in the Internalizing Outcomes of Children in Out-of-Home Care."

The Social Services Administration believes this is a worthwhile study that is in-line with our practices of ensuring safety, permanency, and well-being to our most vulnerable at-risk population our children. It is good to know that this study will look at the guardianship cohort (between ages 5 and 14 years old) in out-of-home placement that may posse anxiety and depression symptoms not yet known due to environmental and innate factors. These findings, if gleaned as factors, can help us build our evidence-base practices to support Families Blossom for better outcomes for youth and families.

Upon the recommendation of the RRB, I am approving this study. As a Memorandum of Understanding (MOU) is required, Maria Tillman, the SSA's Research Review Board liaison, will continue to work with you regarding the signing of a MCU with your organization and SSA. That document will be forwarded to you upon review by the Office of the Attorney General. We apologize for any inconvenience that this may have caused in your research.

If you have any questions about the RRB approval and the MOU process, you may reach Maria Tillman at:

Sincerely,


Rebecca Jones Gaston, MSW
Executive Director
Social Services Administration

cc: Dr. David Ayer, SSA
Brandi Stockdale, SSA
Maria Tillman, SSA
Cathy Dryden, OAG