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Megan Anne Feely

*Washington University in St. Louis*

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WASHINGTON UNIVERSITY IN ST. LOUIS

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Exploring the Relationships between Social Skills, Mental Health and Behavior  
In A Child Welfare Involved Population

by

Megan Anne Feely

A dissertation presented to the  
Graduate School of Arts & Sciences  
of Washington University in  
partial fulfillment of the  
requirements for the degree  
of Doctor of Philosophy

May 2016  
St. Louis, Missouri

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Megan Anne Feely

*Washington University in St. Louis*

*May 2016*

Dedicated to Liam and Kieran.

## ABSTRACT OF THE DISSERTATION

Exploring the Relationships between Social Skills, Mental Health and Behavior

In A Child Welfare Involved Population

by

Megan Feely

Doctor of Philosophy in Social Work

Brown School of Social Work

Washington University in St. Louis, 2016

Professor Patricia Kohl, Chair

Promoting child well-being is one of the three primary goals of the child welfare system. In contrast to safety and permanency, the other two primary goals, that are precisely defined in the federal statute, well-being remains undefined and poorly understood. Recently, the Administration on Children Youth and Families (ACYF) highlighted one facet of child well-being -- social and emotional well-being -- as a particular focus of the agency. These categories, i.e. behavior, emotional development and social functioning collectively are referred to as social and emotional well-being. The relationship between these constructs is unknown although it is likely that they are related to each other. Consequently, it is unclear which constructs, or if all, should be assessed to comprehensively measure social and emotional well-being. Unfortunately well-being cannot be directly analyzed because most of the available measures assess ill-being or the negative aspects of constructs.

The purpose of this dissertation was to develop empirically based, conceptual models of social-emotional ill-being for child welfare-involved youth in two age groups, 8-10 year olds and 11-17

year olds. These models were built through a systematic process of confirmatory factor analyses, which is in the analytic family of structural equation modeling. Because of the ability to include latent variables, i.e. variables not directly observable, and to specify the relationships between constructs, structural equation modeling was uniquely suited to testing these relationships.

# **Chapter 1: Introduction**

Well-being is having its moment in the national conversation about child welfare. The child welfare system (CWS), also referred to as the child protective system (hereafter called the child welfare system), is charged with ensuring the “safety, permanency and well-being” of children who are brought to its attention (U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 1998). Additionally, the social-emotional well-being of child welfare-involved children is a professed priority of the federal government (U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 2012). While safety and permanency are extensively defined in the federal statute and there are specific guidelines for measuring and reporting on safety and permanency, well-being remains undefined and poorly understood.

Recently, the Administration on Children Youth and Families (ACYF) highlighted one facet of child well-being -- social and emotional well-being -- as a particular focus of the agency (U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 2012). The ACYF memorandum introduces a multi-construct definition of “behavioral, emotional and social functioning – those skills, capacities, and characteristics that enable young people to understand and navigate their world in healthy, positive ways (U.S. Department of Health and Human Services, Administration for Children, Youth and Families, 2012), pg. 1).” These categories, i.e. behavior, emotional development and social functioning collectively are referred to as social and emotional well-being. The relationship between these constructs is unknown although it is likely that they are related to each other. Consequently, it is unclear

which constructs, or if all, should be assessed to comprehensively measure social and emotional well-being.

Well-being is a positive state rather than the absence of negatives. Unfortunately, most of the available measures assess ill-being or the negative aspects of constructs. Most current research, and much of the ACYF memorandum about well-being, that uses the term “well-being” is actually referring to ill-being. However, given the extensive literature base of and focus on ill-being, elucidating these constructs is critical to a better understanding of the experience of child welfare-involved children.

Guidance on how to most accurately measure social-emotional ill-being would be helpful at all levels of the system. Researchers and policy makers would have a better understanding of the role of social-emotional ill-being, particularly in relation to safety and permanency. Service providers would be able to more accurately assess and provide services to reduce ill-being.

The purpose of this dissertation was to develop empirically-based conceptual models of social-emotional ill-being for two developmental stages. The two stages are middle-childhood (ages 8-10 years old) and adolescence (11-17 years old). These models can be used to frame the selection of assessments in general, and possibly inform the development of new instruments. The models were built through a systematic process of confirmatory factor analyses. Because of the ability to include latent variables, i.e. variables not directly observable, and to specify the relationships between constructs, structural equation modeling was uniquely suited to testing these hypotheses. The final products contribute to the understanding of social-emotional ill-being for child welfare involved children.

# **Chapter 2: Background and Significance**

## **2.1 Child Maltreatment**

A significant number of children experience child maltreatment during their childhood. Recent estimates of the cumulative risk of maltreatment are that 12.5% of children will experience a confirmed case of maltreatment by 17 years of age (Wildeman et al., 2014). This is a significant public health concern. Experiencing maltreatment increases children's risk of maladjustment in the short-term and long-term. It is well established that children who have been maltreated are more likely than their peers to have behavior problems, cognitive delays, problems with social interactions and mental health needs at the time the maltreatment is investigated or shortly after, i.e. proximal to the experience of maltreatment (C. Casanueva, Ringeisen, Wilson, Smith, & Dolan, 2011; Font & Berger, 2015).

In addition to short-term problems, longitudinal and retrospective studies of child maltreatment provide strong evidence of the adverse distal effects of maltreatment. These studies, specifically the Lehigh Study e.g. (Herrenkohl, Klika, Herrenkohl, Russo, & Dee, 2012), the Spatz Widom longitudinal study (Widom, 1989), a prospective study in New Zealand (e.g., (D. M. Fergusson, McLeod, & Horwood, 2013; D. M. Fergusson, Boden, & Horwood, 2008), a study of chronic neglect and adverse outcomes (Jonson-Reid, Kohl, & Drake, 2012) and the ACES study (Anda et al., 1999; Felitti et al., 1998), have explored the long-term consequences of child maltreatment. These studies consistently find that children who experience physical abuse, sexual abuse and neglect are at higher risk of negative mental health and physical health outcomes in adulthood than their non-maltreated peers. The only study to publish on economic

outcomes found that maltreated children have lower education and earnings as adults as well (Currie & Widom, 2010).

## **2.2 Well-Being**

### **2.1.1 Current definition and measurement of child well-being**

Child well-being does not have a unified and agreed-upon definition in or out of the child welfare system (Webb, Dowd, Harden, Landsverk, & Testa, 2009); CDC website, <http://www.cdc.gov/hrqol/wellbeing.htm>). The child indicators movement, which uses the term well-being extensively, lacks a definition as well. The movement takes a more empirical approach to defining well-being. The most common manifestation of this approach is to produce a *state of the child* report (Ben-Arieh & Goerge, 2001). These reports present various indicators of child well-being for a specified population of children (e.g. all children in the U.S.A.). *State of the child* reports almost always include domains such as health, education and economic well-being. Most include additional domains such as safety, family organization or relationships, social relationships or support, risk behaviors or access to services (Federal Interagency Forum on Child and Family Statistics, 2013; Foundation for Child Development, 2012; Foundation for Child Development, 2012; UNICEF Office of Research, 2013). In general, these reports leave out the underlying assumptions that led them to choose the indicators that are included or even how the domains were identified (e.g. Foundation for Child Development, 2012). The inconsistency in selecting well-being domains and the wide variety of domains that are included lends support to the conclusion that there is not an agreed-upon definition of well-being.

These vague definitions are unhelpful in assessing and improving child well-being. This is an issue that deserves greater theoretical and practical specificity rather than the current grab-bag of possible perspectives, indicators, and measures. A recent publication by Raghavan and



Alexandrova (2014) has taken on the task of defining child well-being. Their *Two Sources Theory* states that:

“A child is doing well to the extent that she:

1. Develops those stage-appropriate capacities that would, for all we know, equip her for a successful future, given her environment.
2. And engages with the world in child-appropriate ways, for instance, with curiosity and exploration, spontaneity, and emotional security. (Raghavan & Alexandrova, 2014), pg. 10)”

The theory describes doing well, or well-being, as preparing for adulthood by developing the necessary skills and abilities while experiencing childhood. It is a dynamic definition that is nonetheless assessing the actual state of the child rather than the environment. It is important to note that this theory considers many of the typical indicators of well-being as pre-requisites or inputs to well-being. For example, it does not include health, safety, poverty, or other domains that are routinely included in well-being reports (Federal Interagency Forum on Child and Family Statistics, 2013; Foundation for Child Development, 2012; Foundation for Child Development, 2012; UNICEF Office of Research, 2013) as measures of well-being. These traditional indicators may be necessary in many or all cases to achieve well-being but they are not sufficient. They also do not contribute to understanding the state of well-being.

Conceptually, this approach frames the discussion of well-being differently than the indicators movement and many of the *state of the child* reports. This theory also allows for well-being to occur under adverse circumstances, such as poverty. As long as the child can still develop future capabilities and engage in their childhood she can experience well-being.

As evidenced by the many attempts to evade a definition, child well-being is a difficult concept to specify. Furthermore, despite its current trendiness it is rarely discussed from a theoretical

perspective. The recent contribution of the *Two Sources Theory* is a useful addition to a sparse field. Applying this theory to the child welfare system would be helpful in that it provides two, and only two, clear categories to measure. It requires the present and future of child welfare involved children, many of whom are poor and all of whom have experienced some level of maltreatment, to be assessed, rather than looking backward on previous experiences such as what type of maltreatment the children experienced. We should be asking, how is she able to engage in a child-appropriate way with the world? Or, what developments should occur to prepare him for the future? This allows for a positive and proscriptive assessment rather than a negative and descriptive one.

### **2.1.2 Ill-Being Versus Well-Being**

In most cases, including in the studies of child welfare involved children, when the term well-being is used what is actually being discussed is the absence of ill-being or absence of maladjustment. This is not necessarily the opposite of well-being which, as discussed above, is a positive state. However, a better understanding and measurement of ill-being in a child welfare involved population is still a critical step in improving the well-being of this population. Currently, there is a significant focus on disparate elements of maladjustment, such as focusing on behavior problems. This project will help clarify which domains need to be measured to assess social and emotional ill-being or maladjustment. Additionally, even though this will be a study of ill-being the categories measured are consistent with, although distinctly not testing, the categories from the Two Sources Theory. Reducing ill-being may be a pre-requisite for this population to prepare for a successful future and engage in the world in a child-appropriate manner.

### **2.1.3 Well-Being within Child Welfare**

Well-being is one of the three goals for children in the child welfare system, safety and permanency being the other two (DHHS, 1998). In 2012 the Administration for Children Youth and Families announced a focus on the social and emotional well-being of child welfare-involved youth (DHHS, 2012). The provision of services in the child welfare system is predicated on the assumption that the services will improve well-being in the short-term. The ACYF document suggests that if maladjustment can be addressed in childhood then the negative distal outcomes can be ameliorated or eliminated (DHHS, 2012). Many of the adverse long-term outcomes are related to poor social, mental health and behavioral outcomes. A better understanding of the negative outcomes proximal to the maltreatment may lead to more efficient assessments and services.

Across multiple studies child welfare involved children fared worse than comparison groups on almost all measures. This finding holds regardless of the specific part of the population (e.g. in-home or in foster care), or the type of data that is used in the analysis (i.e. survey or administrative). Child welfare involved children have a higher prevalence of clinically significant levels of need on cognitive, health and mental health and behavioral measures, poorer educational attainment, and teen-pregnancy, than children in the general population (e.g. (C. Casanueva et al., 2011; Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Claussen & Crittenden, 1991; M. E. Courtney, Terao, & Bost, 2004).

There are six large studies that inform our understanding of the mental health, behavior and social development of child welfare involved children. The studies are the first and second cohorts of the National Study on Child and Adolescent Well-Being (NSCAW I and NSCAW II), The Longitudinal Studies of Child Abuse and Neglect (LONGSCAN), Mental Health Service

Use of Youth Leaving Foster Care (*Voyages*), The Midwest Evaluation of the Adult Functioning of Former Foster Youth (*Midwest Study*), The Northwest Foster Care Alumni Study (*Northwest Study*) and the Child Neglect: Cross Sector Service Paths and Outcomes (*Service Paths*). Taken collectively, these studies provide clear and convincing evidence that regardless of the measures that are used or the segment of the population studied, child welfare involved children have poor outcomes in childhood (Jonson-Reid, Emery, Drake, & Stahlschmidt, 2010; Lanier, Jonson-Reid, Stahlschmidt, Drake, & Constantino, 2010) (Runyan & Litrownik, 2003)(C. Casanueva et al., 2011; Conn, Calais, Szilagyi, Baldwin, & Jee, 2014; Flaherty et al., 2009; Jones et al., 2010; Keller, Salazar, & Courtney, 2010; J. C. McMillen et al., 2004; J. C. McMillen et al., 2005; Tabone et al., 2010) and adulthood or during the transition to adulthood (M. E. Courtney & Dworsky, 2006; M. E. Courtney & Terao, 2006; Jonson-Reid et al., 2012; P. J. Pecora, 2005; P. J. Pecora, White, Jackson, & Wiggins, 2009; P. J. Pecora et al., 2006).

#### **2.1.4 Measurement of Child Well-Being by the Child Welfare System**

The federal government does not include well-being measures in most of the reports it requires.

The required reports are the Adoptions and Foster Care Analysis and Reporting System (AFCARS), the Child Welfare Outcomes report to Congress and the Child and Family Services Review (CFSR). Of these three reports, only the Child and Family Services Review (CFSR), has specific questions that could be considered to be about child well-being. The well-being related questions are:

1. Families have enhanced capacity to provide for their children's needs.
2. Children receive appropriate services to meet their educational needs.
3. Children receive adequate services to meet their physical and mental health needs.

However, these questions would only be defined as measuring child well-being when the broadest possible definition of well-being is used. Rather, they pertain to meeting identified needs rather than children and families' current status, functioning or capacity. Consequently, the required governmental reports do not provide guidance on what should be measured or the general state of well-being for child welfare involved children.

## **2.3 Social Emotional Well-Being**

Just as health is not the absence of disease, social-emotional well-being is not the absence of maladjustment or psychopathology but a different state that includes more positive traits. A useful definition of emotional well-being is “relationships between people which enhance, rather than damage, the well-being of individuals (Buchanan & Hudson, 2000).” For purposes of this dissertation, social and emotional well-being is defined as a state of positive emotions and social interactions, self-regulation of behavior and emotions, and an absence of negative emotions and interactions. Social-emotional well-being is important because the developmental psychopathology literature demonstrate that physical abuse, sexual abuse, and neglect result in a greater risk for poor social, emotional and behavioral problems or psychopathology (e.g. Kim & Cicchetti, 2010; Lynch & Cicchetti, 1991; Manly, Kim, Rogosch, & Cicchetti, 2001). The results of the NSCAW studies and other studies of foster youth further support these findings (Casanueva, Dolan, Smith, Ringeisen, & Dowd, 2012; J. C. McMillen et al., 2005; Raghavan et al., 2012). Psychopathology is a feature of ill-being. The higher risk and evidence of greater rates of problems make social emotional ill-being a logical focus for well-being efforts in this population.

Different terms are used to describe and label the categories of social and emotional ill-being. The ACF memorandum uses the categories from Lou and colleagues (2008) which combines

emotional and behavioral functioning into a single category. However, emotional functioning and behavioral functioning seem to be two distinct manifestations of that construct, particularly in youth. Emotional experience has been defined as people's reports of their subjective states which this is assessed through asking about affective experiences or what people are feeling (Charles, 2010). Although these subjective states may manifest in one's behavior, most of the description is related to internal processes or physiological responses. From the negative or ill-being side, internal processes and physiological response are consistent with mental health problems. For the purposes of this project the terms "mental health" was one domain, "behavioral functioning" a second domain and "social skills and relationships" a third domain. One aspect of the analyses was testing the distinction between the constructs of mental health and behavior. The combination of these domains will be referred to as "social-emotional ill-being".

### **2.3.1 Mental Health**

The World Health Organization defines mental health as:

Mental health is defined as a state...in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.

Most of the focus in the mental health field is on pathology or on the mental disorders.

Mental disorders are defined by diagnostic criteria in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-5) or the International Classification of Disease (ICD-10). The diagnoses are made based on signs and syndromes from the self-report of patients and clinical observation (Black & Andreasen, 2011). A disorder is determined to be present if the person meets the criteria and absent if they do not. Even though psychiatric diagnoses are the gold-standard of determination of mental problems, arriving at a diagnosis requires specific

training, is usually time consuming, and provides a binary determination of a patient having the disorder or not. Most surveys use other measures that assess the presence of a problem without determining a diagnosis. Usually these measures produce a continuous scale from a list of symptoms of the disorder (Snaith, 1993) and identify if someone has more or fewer symptoms of the disorder, rather than determining if the disorder is present or absent. This has practical advantages in capturing the reality of people's experience in that many people, for instance, have an experience that falls somewhere on the continuum between major depression at one end and the absence of all depressive symptoms at the other.

The term internalizing behaviors is often used as a proxy for mental health problems e.g. (Burns et al., 2004). The Child Behavior Checklist Internalizing Behaviors subscale is comprised of the Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints subscales (Achenbach & Rescorla, 2001). Any of these states could impede a person's ability to realize her potential or work fruitfully.

### **2.3.2 Behavior**

Behavior problems are a significant issue for child welfare involved children (Aarons et al., 2010; Burns et al., 2004; Casanueva et al., 2011; Casanueva et al., 2012; Conn, Szilagyi, Jee, Blumkin, & Szilagyi, 2015). A subset of this research focuses on how behavior relates to placement moves for out-of-home children because as behavior problems increase placement moves are more likely (DeGarmo, Chamberlain, Leve, & Price, 2009; Greeno et al., 2016; James, 2004).

The term *child behavior* is used to refer exclusively to children's problematic, disruptive behavior rather than providing a general description of all of children's behaviors. Here, consistent with Achenbach's original definition of externalizing behavior and the NSCAW II

definition (NSCAW Research Group, 2011), behavior is defined as the degree to which the child exhibits conflict with the environment. This distinguishes behavior problems from internalized mental health problems and excludes other behaviors that children exhibit that are not considered problematic. Behavior is often assessed using the Externalizing Problems subscales on the Child Behavior Checklist. The Aggressive and Rule-breaking behavior subscales make up the Externalizing Problems subscale (Achenbach & Rescorla, 2001).

### **2.3.3 Social skills**

Social skills are “the interaction between an individual and the environment and the tools used to initiate and maintain vital interpersonal relations (Elliott & Gresham, 1987).” Social skills are generally acquired through social learning or modeling of appropriate skills. They can be complex verbal and nonverbal interactions that require initiation of interaction and response to others (Merrell & Gimpel, 2014). These skills are needed to interact with peers and adults, in the home, and in the school environment and are a capability the child possesses. There are five dimensions of social skills: peer relations, self-management, adjustment to school rules and expectations, compliance, and assertion. Problems with social skills range from problems initiating interaction to reacting inappropriately to peers or adults (Merrell & Gimpel, 2014).

In the few studies that have examined the social skills of maltreated children, maltreated children were shown to have poorer skills than their peers on most of the above dimensions. Children who have been neglected by their parents are more likely to experience peer rejection in early adolescence and be violent later in adolescence (Chapple, Tyler, & Bersani, 2005). They are more likely to be withdrawn, more disliked, and more physically or verbally aggressive toward peers (Anthonysamy & Zimmer-Gembeck, 2007). Maltreated children also experience poorer



emotion recognition, a key component to interaction, as children (Luke & Banerjee, 2013) and as adults (Young & Widom, 2014).

## **2.4 Developmental Perspective**

Well-being should be considered within a developmental framework. Researchers consistently group children into ages, i.e. stages of development, to assess common developmental constructs for that age group (e.g. Lou, Anthony, Stone, Vu, & Austin, 2008); Wulczyn, Barth, Yuan, Harden, & Landsverk, 2005). The assumption is that the developmental processes that are important at one age may not be appropriate to assess or relevant at an earlier or later stage. Developmental stages originated with Jean Piaget's Theory of Cognitive Development which had six stages from birth to adulthood (Blume & Zembar, 2007). These developmental stages were loosely associated with chronological ages. The commonly used child development categories are infancy, early childhood, middle-childhood and adolescence. This project will focus on middle-childhood and adolescence. However, there is little consensus in the literature of the exact ages that are grouped into middle-childhood and adolescence with different scientists using different age groups for these categories. For example, Blume and Zembar (2007) define middle-childhood as 8-12 years old and adolescence beginning at age 13. Blakemore defines adolescence theoretically as the beginning with puberty but practically uses the age of 12 as the beginning of adolescence in some studies (Burnett & Blakemore, 2009). Other studies have included 11 year olds as adolescents (Burnett, Bird, Moll, Frith, & Blakemore, 2009). Other scientists identified 8-10 year olds as children and 12-14 year olds as young adolescents (Gunther Moor, van Leijenhorst, Rombouts, Crone, & Van der Molen, Maurits W, 2010). The descriptions that follow use the age-groupings of Blume and Zembar. However, given the terminological confusion of the beginning of adolescence and the

availability of measures, the age groups here are 8-10 year olds categorized as middle-childhood, specifically late middle-childhood and 11-17 year olds as adolescents.

### **2.4.1 Middle-childhood**

Middle-childhood is approximately from the age of 8 to 12 years old. It is a period where children develop more advanced cognitive skills. For example, children begin to apply logical solutions to problems, classify objects by type, and understand the conservation of weight mass and numbers. Peers become more important at this stage than earlier in childhood. Children also develop a sense of self that is influenced by but separate from the opinions of others. They also become more aware of others perceptions about them. During this phase, children should develop emotional competence and begin to understand their own emotions and the emotions of others. Additionally, better emotional control should develop during this period (Blume & Zembler, 2007). This was an interesting and important age to analyze for this dissertation because the more prominent role of peers and the development of emotional competence increased the possibility that mental health, social skills and behavior could be identified as distinct constructs.

### **2.4.2 Adolescence**

Adolescence begins around 13 years of age and continues at least until 18 years of age. Youth develop abstract thinking and are able to consider abstract concepts and possibilities. Decision-making and reasoning are still developing and adolescents may have difficulty assessing the reliability of information or assimilating information that is not consistent with their beliefs. This is a period when youth develop an identity that reconciles self-understanding and the opinions of others. Emotional development and self-understanding mature during this phase (Blume & Zembler, 2007).

These age-groups were selected because children and youth are separating from their families, forming stronger peer relationships, and developing a self-identity. Their perceptions of how they feel and their experiences may be sophisticated enough to provide a useful and interesting perspective. Adolescents were analyzed separately from the youth in middle-childhood because with the additional social and emotional development in adolescence it seemed likely that the domains could manifest differently.

## **2.5 Scope of the Dissertation**

More work is needed to develop the conceptualization and measurement of social-emotional ill-being. This dissertation will try to fill this gap by developing age-specific models of the relationships between mental health, behavior and social skills/relationships. The models will help researchers and practitioners better understand the complex nature of child welfare-involved children's social and emotional ill-being. Specifically, the models will be useful in identifying the domains that need to be measured to comprehensively assess social-emotional ill-being in direct practice. Additionally, the relationships between the domains could inform the development and deployment of interventions. The final models can be used in research analyses to better understand children's engagement with and movement through the child welfare system, and their social-emotional ill-being at different stages of engagement. While the results will not be immediately applicable to practice, the findings will bring us closer to identifying possible measures and provide some guidance as to what refinements may be needed.

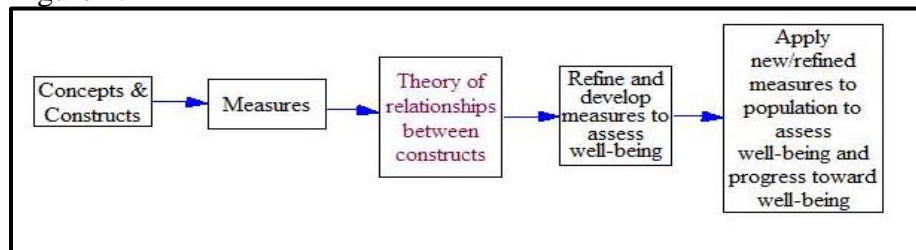
### **2.5.1 Need for a Theory**

To improve the social and emotional well-being of child welfare involved children, there is a need for a specific and testable theory that can inform the selection or development of measures. Behavior, emotional development, mental health, social skills and social relationships are

presumed to be related by researchers studying and writing about well-being for child welfare involved children (e.g.(C. Casanueva et al., 2012; Lou et al., 2008) but the specific nature of the relationships is not addressed. This leaves individual researchers and administrators to decide what to measure.

This project will bring clarity to the underlying aspects of the “problems” that child welfare involved children demonstrate. A theory will provide guidance to move the field toward a comprehensive and cohesive assessment of ill-being. This dissertation is situated in the middle of a process to improve the assessment and treatment of social and emotional ill-being. Figure 2.1 represents a conceptual model for how this dissertation relates to the development of appropriate assessments of ill-being in this population.

Figure 2.1



The results of this study should lead to a leaner list of possible measures or concepts to measure. A theory-testing approach to understanding the relationships between these domains will provide a theoretical foundation for future measurement of social-emotional ill-being in this population.

### 2.5.2 Theory Development

Theories can describe, explain or predict phenomena (Freese, 1980; Gerring, 2001). The current state of the literature lacks a cohesive and measurable theory guiding the assessment of ill-being

for child welfare involved children. The framework cited by ACYF includes too many domains for practical assessment and does not provide any guidance as to the prioritization of the domains. It also ignores how the different domains might relate to each other, such as if a problem is identified in one area what other areas are likely to be problematic. This is insufficient guidance for busy child welfare agencies that need to produce results and provide clear direction to their staff members

This dissertation develops of a theory of the “middle range” (Gerring, 2001; Merton, 1949) for the social-emotional ill-being of child welfare-involved children. Merton defines theories of the middle range to be between the “minor but necessary working hypotheses that evolve in abundance during day-to-day research” and “all inclusive systematic efforts to develop a unified theory” (Merton, 1949, pg. 448). He further specifies that these theories are specific enough to be empirically tested yet more than a detailed description of a phenomena. Gerring (2001) provides some additional criteria. In his definition, to be a theory of the “middle range” it should apply to a distinct population (child welfare involved children) where it is possible to have clear specification. This addition may be a specification of Merton’s “special theories applicable to limited conceptual ranges (Merton, 1949, pg. 457). Theories of the middle range are in contrast to a very specific theory that may have no generalizability, such as explaining a single child’s state of well-being, or grand unifying theory that seeks to explain society as a whole. This dissertation is a specific and focused test of possible, empirically specifiable relationships. Additionally, the theory will have analytic utility (Gerring, 2001, pg. 107) and therefore it can be used by policy makers or researchers who are focused on improving the ability of the child welfare system to accurately assess ill-being.

### **2.5.3 Preliminary Theory and Hypotheses**

Much of the analysis in this dissertation used an inductive process to identify the relationships.

However, the state of the field is not tabula rasa and I think best practice is to specify the preliminary status of the theory and the hypotheses that I tested. The theory and hypotheses represent deductions obtained from previous research, practice experience and current work with an agency that works with foster children. The results of the tests of the hypotheses were used to develop and refine the preliminary theory.

Aim 1: Specify a theory of the relationships between social skills, mental health and behavior for a child welfare-involved population.

Preliminary Theory: In a child welfare-involved population, social skills, mental and behavior are related domains.

Hypothesis 1: Social skills, mental health and behavior are three distinct constructs as assessed by existing measures.

Hypothesis 2: The constructs are positively correlated. Children with more problems in one area will have more problems in the other areas as well.

Hypothesis 3: The constructs are not strongly correlated but are related to each other by an underlying construct of social emotional ill-being.

Aim 2: Test the invariance of the model from Aim 1 across demographic groups.

# **Chapter 3: Methods**

This dissertation used the Second Cohort of the National Survey of Child and Adolescent Well-Being (NSCAW II) to explore the relationships between the social, mental health and behavioral domains for child welfare involved 8-10 year olds and 11-17 year olds. Structural equation modeling in Mplus was used to develop and test confirmatory factor models of the relationship between these domains. The best fitting model that included all domains was assessed for measurement invariance for gender and race/ethnicity.

## **3.1 Sample**

The sample was from the NSCAW II (n=5,872) and this study used the sub-sample of 8-17 year olds at the baseline assessment (n=1,652). The sample is drawn from investigations of child abuse or neglect that closed between February 2008 and May 2009. Baseline data were collected during a 15-month period from April 2008-December 2009. The measures that are used to assess the domains of well-being in the NSCAW II are restricted by age. To maximize the number of different measures used while maintaining a developmental focus, one model will be developed for the developmental stage of late middle-childhood consisting of youth 8-10 years old (n=598) and a second model will be developed for the adolescent stage of the youth who are 11-17 years old (n= 1,054).

### **3.1.1 Sampling Design**

NSCAW II used a two-stage stratified sampling design to make the sample representative of the population from which it was drawn. The country was stratified into nine strata consisting of the eight states with the largest child welfare populations and a ninth strata of the other states and the District of Columbia. To be included in the sampling frame, states had to allow the NSCAW staff to contact the family before staff from the child protective agency contacted the family.

This requirement limited the number of states that could participate to 42. One of the eight states that was excluded in the NSCAW II was a key state in the NSCAW I. Primary sampling units (PSU) were created within each stratum. Generally, a PSU was the geographic area served by a single child protective service agency and was either a single county or, if the agencies had small caseloads, two or more adjacent counties. The NSCAW II has 83 PSUs including the five that were added to replace a key state lost from the NSCAW I.

The second stage of stratification was within each PSU. Five domains were identified for sampling in the NSCAW II five domains. These domains were: (1) All children birth-17.5 who were not receiving CPS agency-funded services; (2) infants, less than 12 months, receiving CPS funded services and were in out-of-home care; (3) infants, less than 12 months, receiving CPS funded services and not in out-of-home care; (4) Children ages 1-17.5 years old receiving CPS funded services and in out-of-home care; (5) Children ages 1-17.5 who were receiving CPS funded services and were not in out-of-home care. Only one child per household was eligible for the study to minimize the burden on the family and presumably to eliminate clustering by family. If a child had multiple reports during the 15-month time frame she could only be sampled once. The final stage of sampling was a simple random sample of from each of the five domains of the children who met the eligibility criteria.

### **Weights**

In addition to the stratification in the sampling frame, the data are weighted to be nationally representative of the 42 states and the District of Columbia. The sample is weighted to account for selection probabilities that varied depending on availability of subjects and the first and second stage sampling domains. However, the eight “agency-first” contact states are excluded



from the weighted adjustments so the results cannot be considered to apply to them. By extension, even with the weights, the NSCAW II is not a nationally representative sample.

The purpose of the weights is to be able to approximate how the results would apply across the population. The purpose of this dissertation was to understand how these measures and domains related to each other. The weights have no bearing on these relationships and would only create methodological problems as the techniques for assessing the psychometric properties of weighted confirmatory factor analyses have not been developed. Additionally, the weights are the inverse proportion to being selected into the sample. As we do not fully understand the ill-being of the population and how different sub-samples of the population may vary in their ill-being, the weights are not applicable to this question. Therefore, they were not used.

## 3.2 Measures

Table 3.1 displays a complete list of the measures used and the ages of children to which they were administered.

Table 3.1: Domains, Constructs, Measures, Respondent and Ages Measure Administered to

Domain	Construct and Measure	Respondent	Ages at which Measure Administered										
			8	9	10	11	12	13	14	15	16	17	
Social	Social skills: Social Skills Rating System (SSRS) 8 -10 year olds	Caretaker	x	x	x							x	x
	Social Skills: SSRS 11-17 year olds	Caretaker				x	x	x	x	x			
	Social problems: CBCL Social subscale	Caretaker	x	x	x	x	x	x	x	x	x	x	x
	Social Skills: SSRS	Teacher	x	x	x	X							
	Social skills: SSRS	Teacher					x	x	x	x	x	x	x
	Social experience: Loneliness and Social Dissatisfaction	Youth	x	x	x	x	x	x	x	x	x	x	x
	Negative peers: Deviant Peer Affiliation Social problems : Youth Self Report (YSR) Social Subscale	Youth				x	x	x	x	x	x	x	X
Mental Health	Depression: Children’s Depression Inventory	Youth	x	x	x	x	x	x	x	x	x	x	x
	Trauma: Trauma-related intrusive thoughts and nightmares, Post-traumatic subscale of the Trauma Symptom Checklist for Children	Youth	x	x	x	x	x	x	x	x			
	Substance abuse: CRAFFT	Youth				x	x	x	x	x	x	x	x
	Depression: YSR-DSM Affective subscale	Youth				x	x	x	x	x	x	x	x
	Anxiety: YSR-DSM Anxiety subscale	Youth				x	x	x	x	x	x	x	x
	Somatic problems: YSR Somatic subscale	Youth				x	x	x	x	x	x	x	x
	Thought problems: YSR Thought problems subscale	Youth				x	x	x	x	x	x	x	x
	Depression: CBCL-DSM Affective subscale	Caretaker	x	x	x	x	x	x	x	x	x	x	x
	Anxiety: CBCL- DSM Anxiety subscale	Caretaker	x	x	x	x	x	x	x	x	x	x	x
	Somatic complaints: CBCL Somatic subscale Thought problems: CBCL Thought problems subscale	Caretaker Caretaker	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Behavior	Attention Problems: YSR Attention subscale	Youth				x	x	x	x	x	x	x	x
	Rule-breaking Behavior: YSR- Rule Breaking subscale	Youth				x	x	x	x	x	x	x	x
	Aggressive Behavior: YSR - Aggressive Behavior	Youth				x	x	x	x	x	x	x	x
	Rule-breaking CBCL - Syndrome - Rule Breaking	Caretaker	x	x	x	x	x	x	x	x	x	x	x
	Aggressive CBCL- Syndrome - Aggressive Behavior	Caretaker	x	x	x	x	x	x	x	x	x	x	x
	Attention Problems – CBCL	Caretaker	x	x	x	x	x	x	x	x	x	x	x

### **3.2.1 Child Behavior Checklist and the Youth Self Report**

The subscales from the CBCL are used extensively in this model. To avoid repeating information about the measure in subsequent sections, the description and psychometric properties for the entire CBCL are presented here. The CBCL, Teacher Report Form and YSR were designed to be used together to provide different perspectives on the child's behavior. The aim was also to have a report of the child's behavior in different settings because behavior often varied between settings. The measures were developed using an empirical rather than theoretical foundation. They were most recently refined and updated in 2001 when the CBCL/6-18 replaced the 1991 CBCL/4-18 (Achenbach & Rescorla, 2001). The 2001 version was normed on a non-clinical nationally representative sample (n=1,753). The test-retest reliability was  $\alpha=0.95$  ( $p<.001$ ) for the specific problem scales.

In addition to the empirically-derived syndrome scales, the developers worked with 22 "highly experienced child psychiatrists and psychologists from 16 cultures" to develop subscales from the existing CBCL items that were more closely aligned with DSM-IV criteria than the syndrome subscales (Achenbach & Rescorla, 2001). There are six DSM-oriented subscales, Affective Problems, Anxiety Problems, Somatic Problems, Conduct Problems, Oppositional Defiant Problems, and Attention Deficit Disorder Problems. These subscales also had strong internal reliability ( $\alpha=0.72-0.91$ ).

In this study the Affective and Anxiety DSM-oriented scales were in the mental health domain to have better correspondence between the constructs that the scale purports to represent and existing DSM diagnoses. Previous studies have found that the DSM-oriented Affective Scale performed similarly to the empirically based scales and the Anxiety Scale performed better than empirically based subscales in determining concordance with DSM-IV diagnoses (Ebesutani et

al., 2010)(Ebesutani et al., 2010; (Ferdinand, 2008). There is a DSM-Oriented scale for Somatic Complaints and ADHD but there was no literature assessing the accuracy of these scales so the original empirically based scales were used. The more comprehensive list of the empirically derived Rule-Breaking Behavior and Aggressive Behavior was used in the behavior domain. The two empirical scales include 35 problem behaviors compared to only 18 problem behaviors in the DSM-Oriented scales. Consequently, the empirical scales are likely to provide a fuller picture of the range of behavior problems that parents and caretakers may experience. There is no DSM-Oriented scale for Social Problems or Thought Problems so the empirically based subscale was used.

Multicollinearity is a potential problem with using the Youth Self Report and the care-taker reported Child Behavior Checklist. The multicollinearity of these two variables will be tested in the preliminary data steps.

### **3.2.3 Measures of Mental Health**

#### **Depression**

Depression was measured by the Children's Depression Inventory (CDI) and the DSM-oriented Affective Problem scale from the CBCL and YSR. The NSCAW II used the Children's Depression Inventory (CDI) to evaluate a "range of depressive symptoms (NSCAW Research Group, 2011), pg. 11)". The CDI is derived from Beck's Depression Inventory and was developed in the late 1970s (Saylor, Finch, Spirito, & Bennett, 1984); the version administered in NSCAW II was copyrighted 1982. It is the most common measure for assessing children's depression (Twenge & Nolen-Hoeksema, 2002)) but studies have found that it may not always discriminate between children with depression and children with problems other than depression (Saylor et al., 1984). For the purposes of this study this is an acceptable limitation because it is

part of the larger mental health domain rather than being used as an individual measure to determine depression rates.

The DSM-oriented Affective Problems subscale from the CBCL and YSR was used. In a validity study, the Affective Problems scale was consistent with a DSM-IV diagnosis of major depressive disorder or dysthymia (AUC=.77-.83 (CBCL) and .77-.90 (YSR)).

### **Trauma**

The only trauma-related measure in the NSCAW II is the Post-Traumatic subscale of the Trauma Symptom Checklist- Alternate Version (TSCC-A) and this subscale was used. The full measure has six clinical subscales and uses a 4-point Likert scale from 'never' to 'almost all the time'. The TSCC was normed on a sample of 3,008 children and has a cutoff to designate a clinical range. The Post-Traumatic Stress subscale was designed to measure intrusive thoughts and nightmares related to the traumatic event.

### **Substance Abuse**

The CRAFFT, thus named because the letters are an acronym of key words in the measure, was used to assess for alcohol or drug problems. The CRAFFT is a screening tool. A score greater than two is considered problematic while a score greater than four may indicate dependence (Knight, Sherritt, Shrier, Harris, & Chang, 2002). The validity of the CRAFFT was tested on a population of youth recruited from a hospital clinic (n=538). The screening demonstrated good sensitivity (0.76) and specificity (0.94) when compared with DSM-IV diagnostic criteria (Knight et al., 2002).

### **Anxiety**

Anxiety was measured using the Anxiety Problems DSM-Oriented subscale from the CBCL (6/18) and YSR. The Anxiety Problems scale had lower AUC values than the Affective

Problems scale (AUC values .65-.70 for the CBCL and .62-.76 for the YSR) (Ferdinand, 2008). However, in the absence of a better measure in the NSCAW II, this scale was a reasonable option.

### **3.2.4 Measures of Behavior**

#### **Aggressive Behavior**

Aggressive behavior was measured using the Aggressive Behavior subscale from the CBCL and YSR. The Aggressive Behavior syndrome scale has questions that refer to the youth's unpleasant or dangerous behavior. Generally, this behavior is problematic for their placement or parents but it is not illegal. For example, the scale has questions such as how often the child is "mean to others", "argues a lot" or "attacks people".

#### **Rule Breaking Behavior**

The Rule Breaking Behavior subscale of the CBCL and YSR consists of questions that ask about how often the child exhibits behavior that is illegal or against the rules of most institutions such as lying or smoking.

### **3.2.5 Measures of Social Skills and Relationships**

#### **Social Skills**

The Social Skills Rating System (SSRS) and the Social Problems subscale on the CBCL were used to assess social skills. The SSRS has three major scales, Social Skills, Problem Behaviors and Academic Competence, and has a teacher and caretaker report. Only the Social Skills scale was administered in NSCAW II. The SSRS has different measures for 3-5 year olds, 6-10 year olds and for children 11 years and older. All three age groups have four subscales, Cooperation, Assertion, Responsibility and Self-control on the parent form; the teacher form does not have the Responsibility subscale (Gresham, Elliott, Vance, & Cook, 2011)). The internal reliability is reasonably strong with alphas from 0.65-0.80 on the parent form and 0.86-0.93 on the teacher

report form (Gresham et al., 2011). Multicollinearity was assessed for these two scales. The CBCL and YSR Social Problems scale is an 11-item sub-scale that assesses how well the child is able to be independent and how well he gets along with others. It is an empirically derived scale that is not included on the Internalizing or Externalizing sub-scales.

### **Peers**

Peer relationships were measured with the Deviant Peer Affiliation Scale. Using a 6-item scale the measure assesses how frequently the youth's friends demonstrate illegal or unethical behavior. The measure has questions such as "During the last year, how many of your friends have cheated on school tests?" with a five point None-to-All Likert scale as the response option. In a study of pre-adolescent and adolescent boys, the internal reliability was good with  $\alpha=0.89$  at Wave 1 and  $\alpha=0.80$  at Wave II (Dishion, Patterson, Stoolmiller, & Skinner, 1991). This measure was useful because it provided insight into the peers that the youth chose.

### **Loneliness**

The child's perception of their relationships with their peers was assessed with the Loneliness and Dissatisfaction Scale, a 24 item self-report of the child's perception of their relationships with peers (Cassidy & Asher, 1992)). The original scales include 16 relevant items and 8 unrelated items such as "Do you like music?". These other items were included to encourage the children to answer more openly but in the NSCAW II children were only asked the relevant items. This scale was reverse-scored in the NSCAW II so that higher scores would represent more problems.

### **3.2.6 Attention Problems**

The Attention Problems subscale of the CBCL/YSR was used to assess attention problems.

Attention problems could be considered a behavior problem or a mental health problem. ADHD

is a DSM-5 diagnosis; however, many of the symptoms of ADHD are overt behaviors that parents and caretakers could consider problematic. For example, some of the questions ask about not being able to sit still, being impulsive, inattentive, or acting too young for their age. The empirically-derived Attention Problems scale will be tested in the mental health model and in the behavior model.

### **3.3 Analytic Approach**

Univariate analyses were used to describe the population and the measures. Correlations within each domain were used to assess for multi-collinearity.

Through an alternative model testing approach, confirmatory factor analysis (CFA) was used to determine the indicators that related to the mental health, social and behavior domains and the relationships between the domains. In the alternative models approach, more than one model is identified *a priori* and each model is tested using the same data (Kline, 2011). This approach allows multiple models or modifications of a single model to be tested without trying all possible variables and combinations. Another potential approach was a multitrait-multimethod (MTMM) model. The MTMM approach assesses the construct validity by assessing for convergent and discriminant validity of several traits that have been assessed by several methods (Byrne, 2013). This approach requires, ideally, three traits to be assessed by three different methods. Additionally, MTMM models frequently have difficulty converging (Byrne, 2013). The correlated uniqueness (CU) was another possible analytic approach. Given the developmental nature of this study the CU model seemed more appropriate for a later study once a preliminary understanding of these domains was established.



A series of models were developed to assess whether mental health, social and behavior were three separate domains, and how the domains were related. Separate models were developed for the two age-groups, 8-10 year olds and 11-17 year olds. Model fit was assessed using the cut-offs for the fit indices endorsed by Bowen and Guo (2011). The maximum likelihood robust estimator (MLR) was used to accommodate the non-normality of some of the indicator variables while retaining the advantages of full-information maximum likelihood estimation.

For each age-group, these steps were followed to determine the number and composition of domains:

1. One factor: A single latent factor was run with all of the indicator variables. This was tested to rule it out as a possibility.
2. Two-domain factors: The indicators for mental health and behavior were included on one latent factor and the fit was assessed. Then models of mental health and social, and social and behavior. Model fit was assessed using fit indices.
3. Three factors: A model of each domain was developed and tested with and without method effects. Specifically, a model of mental health as a latent factor, a model of social as a latent factor, and a model of behavior as a latent factor were developed with covarying errors or latent factors for the respondent. Attention problems was tested as a mental health problem and as a behavior problem. Very low-loading indicators or indicators that were not significant were trimmed at this stage.

### **3.3.1 Hypothesis Testing**

Two hypotheses were compared: (1) that the three domains were correlated and would have a positive and meaningful covariance and (2) that they were related by a higher-order factor. The best-fitting individual domains were put into these two models to test these hypotheses. The

models were compared using the available fit-indices. The latent factors for respondent were included in these models. Modification indices were examined to assess for localized strain. In the final models, the highest modification index for a covarying error was released if the relationship was theoretically supported.

### **3.3.2 Assessment of Model Fit**

The fit of a model assesses how well the actual data fit the matrix of data that is produced by the model. Measures of fit assess this difference or discrepancy. The cut-offs for each fit statistic or fit index set a threshold for how large the difference can be between the data and model and still be considered an acceptable model for the data. Each fit index has a recommended cut-off point. The model chi-square should not be significant; RMSEA should  $\leq 0.05$  for close fit and  $\geq .10$  as poor fit (Bowen & Guo, 2011). The CFI and TLI should be  $\geq 0.95$  (Bowen & Guo, 2011) and the SRMR  $< 0.08$  (Hu & Bentler, 1999). Different fit indices should be considered because each assesses a different type of fit (Brown, 2006). Given the larger sample size and the sensitivity of the model chi-square to sample size (Kline, 2011), a model was considered to have acceptable fit with a significant chi-square value. Modification indices were used to identify areas of localized strain where the model fits poorly on specific parameters.

### **3.3.3 Method Effects**

Consistent error as a result of the respondent can be modeled as method effects in SEM (Brown, 2006). If there were only two indicators or measures for the respondent then the error of those indicator variables was allowed to covary. If there were more than two then a latent construct for the respondent was created. The respondent that had fewer measures for the domain was selected to have the latent factor. That is, if there were three youth reports and five caretaker reports then a latent factor for the youth report was used. To simplify the results section, the

term *caretaker latent factor* refers to a latent factor of all the caretaker-reported measures in the model. The term *youth latent factor* refers to a latent factor of all the youth-reported measures in the model.

### **3.3.4 Mean Value and Intercept Invariance**

The mean value for the latent factor may vary for different demographic groups. Additionally, the factor structure and parameters of a model may vary by demographic group suggesting an underlying difference in the latent construct for each group (Brown, 2006). Measurement invariance was assessed using the Multiple Indicators Multiple Causes (MIMIC) modeling approach. In a MIMIC model, the demographic grouping variable is regressed on the latent factor to assess for mean differences and on each indicator variable to assess for intercept invariance by group. The final three-factor models were assessed for mean differences and intercept invariance by gender and race ethnicity.

# **Chapter 4: Results**

For ease of presentation, the results are presented by age-group. All of the results for the 8-10 years olds including bivariate analysis, invariance testing, and hypotheses testing are presented before moving on to the results for the 11-17 year olds.

## **4.1 Eight to Ten Year Olds**

### **4.1.1 Population Description**

The sample was 53.3% male, and 46.7% female (Table 4.1). White (36.5%), African American (29.3%) and Hispanic children (26.3%) were

almost equally represented. The rest of the children were categorized as Other (8%), which included Native American/indigenous children and Asian children. The majority of children remained in their home of origin (67.7%). Of children who were not in their home, 7.7% were in an informal kinship arrangement, 8.2% in a formal kinship arrangement, 14.7% in non-relative foster care and 1.7% in a residential placement. The majority of children lived in urban areas (86%).

**Table 4.1: Basic Demographics 8-10 Year Olds**

<b>Variable</b>	<b>N</b>	<b>%</b>
Total	598	100
Gender- male	319	53.3
Female	279	46.7
Race/ethnicity - White	218	36.5
African American	175	29.3
Hispanic	157	26.3
Other	48	8.0
Age		
8	218	36.45
9	181	30.27
10	199	33.28
Placement - Parent	405	67.7
Formal kinship	49	8.2
Informal kinship	46	7.7
Non-relative foster care	88	14.7
Residential/other	10	1.7
Urban	519	86.0
Non-urban	84	14.0

### **4.1.2 Ill-being Measures**

Measures of central tendency and dispersion are presented in Table 4.2. The raw scores of the CBCL measures were used in the analysis because the T-scores attenuate the highest values (Achenbach & Rescorla, 2001). However the T-scores can be used to compare this population to the general population. A T-score between 65 and 69 on the syndrome scales is considered

borderline and a score above 70 is the clinical range. In the normed population, a T-score of 65 was the 93<sup>rd</sup> percentile and 70 was the 97<sup>th</sup> percentile. In this sample, the percentage of Somatic Complaints scores in the clinical range were similar to the normed sample with 2.5% of the sample with a score greater than 70. However, on the other CBCL scales 9%-17% of the sample was in the clinical range, indicating more problems among the child welfare-involved population vs. the normed population.

**Table 4.2: Descriptions of measures, 8-10 year olds**

Domain and Measures	N	Mean (SD)	Median	Range
<b>Social Skills</b>				
Loneliness and Social Dissatisfaction: youth report	480	33.1 (12.5)	31	16-80
Social Skills: caretaker report	577	46.7 (12.1)	48	2-72
Social Skills: teacher report	287	34.9 (12.0)	34	9-60
Social problems: caretaker report	596	4.2 (3.8)	3	20 -
<b>Mental Health</b>				
Depression: youth report	491	9.7 (7.9)	8	0-41
Depression: caretaker report	596	2.6 (3.2)	2	0-16
Intrusive thoughts from trauma: youth report	490	9.3 (6.4)	9	0-30
Anxiety: caretaker report	596	2.4 (2.3)	2.4	0-12
Somatic Complaints: caretaker report	595	1.6 (2.2)	1	0-16
Thought Problems: caretaker report	595	3.7 (4.3)	2	0-24
<b>Behavior</b>				
Rule-breaking behavior: caretaker report	595	3.6 (3.8)	3	0-23
Aggressive behavior: caretaker report	595	8.7 (8.1)	7	0-36
Attention Problems: caretaker report	596	6.2 (4.8)	6	0-20

The Child Behavior Checklist subscales generally behaved as a count variable with corresponding distributions but other measures were close to a normal distribution. The skew and kurtosis were outside  $\pm 1$  for the caretaker report of social problems, depression, anxiety, somatic complaints, thought problems, rule-breaking behavior and youth report of depression. The skew was 1.15 for caretaker-reported aggressive behavior, but the kurtosis was less than 1 (0.85). All of the extreme skew and kurtosis values were positive indicating that there was a

cluster of low scores and then a long tail toward the high scores. A positive kurtosis value greater than or less than 1, indicates a steeper peak. In all cases there was a larger clustering of very low scores than would be consistent with a normal distribution.

There was very little missing data on the caretaker-reported measures with fewer than five observations missing. The youth-reported measures are missing about 18% or 108 observations.

### 4.1.3 Bivariate Correlations

The correlations between the social skills measures, presented in Table 4.3, ranged from a low of 0.22 between youth-reported loneliness and caretaker-reported social skills (reverse scored). The highest correlation was between the caretaker report of social skills and social problems (0.56).

All correlations were significant at  $p < .001$  and none of the values were high enough to cause concerns about collinearity. Because attention problems could have been categorized with Mental Health or Behavior, the correlations

of these measures were run together (Table 4.4). The highest correlation between two mental health or behavior measures was between caretaker-reported aggressive and rule-breaking behavior (0.84). The lowest correlations were between the youth-

reported trauma measure and the caretaker reported measures (0.09 – 0.13). Several of the correlations were higher than 0.70. This

indicates that too much variance may be shared to produce accurate results in OLS regression.

Caretaker-reported thought problems had consistently high correlations with the other caretaker-reported measures. The correlation of the caretaker and youth-reports of youth depression, the

**Table 4.3: Social measures correlations, 8-10 year olds**

	Loneliness – yth	Social problems - caretaker	Social skills – caretaker	Social skills – teacher
<i>Loneliness – yth</i>	-			
<i>Social problems- caretaker</i>	0.30	-		
<i>Social skills – caretaker</i>	0.22	0.56	-	
<i>Social skills - teacher</i>	0.24	0.32	0.27	-

only construct that was measured by both respondents, was very low (0.19) but the correlation between youth-reported depression and trauma was higher (0.47). These correlations show a consistent pattern of closer association by respondent than by domain.

**Table 4.4: Correlations of mental health and behavior measures 8-10 year olds**

	Depression – yth	Trauma – yth	Depression - care	Anxiety - care	Somatic - care	Thought - care	Rule-Breaking	Aggressive	Attention
<i>Depression – yth</i>	-								
<i>Trauma – yth</i>	<b>0.47</b>	-							
<i>Depression - care</i>	<b>0.19</b>	<b>0.12</b>	-						
<i>Anxiety – care</i>	<b>0.18</b>	0.09*	<b>0.70</b>	-					
<i>Somatic complaints – care</i>	<b>0.12</b>	0.10*	<b>0.61</b>	<b>0.56</b>	-				
<i>Thought problems – care</i>	<b>0.15</b>	0.11*	<b>0.76</b>	<b>0.70</b>	<b>0.55</b>	-			
<i>Rule-breaking – care</i>	<b>0.21</b>	<b>0.13</b>	<b>0.57</b>	<b>0.35</b>	<b>0.35</b>	<b>0.71</b>	-		
<i>Aggressive behavior – care</i>	<b>0.20</b>	<b>0.11</b>	<b>0.67</b>	<b>0.45</b>	<b>0.45</b>	<b>0.76</b>	<b>0.84</b>	-	
<i>Attention problems – care</i>	<b>0.23</b>	<b>0.12</b>	<b>0.65</b>	<b>0.40</b>	<b>0.40</b>	<b>0.75</b>	<b>0.69</b>	<b>0.77</b>	-

#### 4.1.4 Preliminary Model Results

The results from the preliminary models that were used to identify the final models are presented in Appendix A. The final models from the preliminary stage are presented in Table 4.5. The guidelines for fit indices are detailed in Table 4.6. Because of the variation in the scales of the

measures, fully standardized

factor loadings are used to

make comparisons between the

observed variables easier to interpret.

Table 4.6: Fit Indices and Critical Values

Fit Index	Close Fit
RMSEA - Root Mean Square Error of Approximation	<0.05
TLI - Tucker Lewis Index	≥0.95
CFI - Comparative Fit Index	≥0.95
SRMR - Standardized Root Mean Square Residual	<0.08
Chi-square	NS

The model with all measures loading onto a single factor did not fit the data well and all fit indices were outside the acceptable range (Model 1, Appendix A). However, many of the

models where the latent factor encompassed two domains did fit the data (Models 2-8). A latent factor for the youth-reported measures (youth latent factor) was used in these two-domain models which improved model fit. A single domain a model with good fit was developed for Mental Health, Behavior and Social using a latent factor for the respondent (Models 9-19).

### **One Factor**

A single factor with all of the items included had a poor fit and all fit statistics were outside of the acceptable range (Model 1). In this model, all of the measures were included with no correlated errors or method effects. Using the fully standardized loadings, the aggressive behavior scale had the highest loading (0.90) followed by the thought problems scale (0.87). The lowest loadings were from the youth-reported measures (trauma, depression and loneliness scales). Because of the poor fit, at this stage a single-domain factor was ruled out.

### **Two Factors**

In the models that included two domains (Models 2-Model 8), some of the models fit relatively well and several of the models had fit statistics within the acceptable ranges. Once a latent factor for the respondent was added, Social and Mental Health fit well in a model as did Social and Behavior. Because it was unclear how all three domains related to each other, the preliminary steps were continued to develop single-domain models.

### **Social Skills and Mental Health**

The Mental Health and Social latent factor (Model 2) did not fit the data well. Because this model had three youth reports, a youth latent factor was used rather than several correlated errors (Model 3). Then two latent factors were used, a youth latent factor and one for the caretaker reported-measures (caretaker latent factor) (Model 4). Both Model 3 and Model 4 had fit indices in the acceptable ranges. The highest loading was from caretaker-reported thought problems.



Only one modification index had a value greater than 10 suggesting that there were few areas of localized strain.

### **Mental Health and Behavior**

The model of Mental Health and Behavior did not have good fit indices (Model 5). Adding the youth latent factor made the model just-identified with no fit indices (Model 6). A model of Mental Health and Behavior was run with the errors from the youth reports of depression and trauma allowed to covary (Model 6a). The model fit indices were out of the acceptable range (Appendix A). The strongest loadings were thought problems (0.89) and aggressive behavior (0.89). The covariance between the youth reports was 0.46. The modification indices were examined to identify problems with the model and possible areas of localized strain. Thirteen of the modification indices were over 10 suggesting the model fit poorly in several places. The highest value was for allowing the errors of aggressive and rule breaking behavior to covary (MI=155.00, EPC=6.34), i.e. the two Behavior measures. Because all of the fit indices were out of the acceptable ranges, no further adjustments were made to this model.

### **Social skills and Behavior**

Even without a latent factor for respondent, most of the fit indices of the Social and Behavior model were within the acceptable ranges (Model 7); only the chi-square test and the RMSEA were outside the range. Adding a caretaker latent factor improved the RMSEA value and the chi-square approached non-significance (Model 8). Additionally, all of the loadings for Model 8 were salient at greater than 0.40.

### **Summary of the combination factor results**

The latent factors of Social and Behavior, and Social and Mental Health had acceptable fit indices. However, the fit indices for the models of Mental Health and Behavior were outside the

acceptable ranges. This was an unanticipated finding given the similarity of aggressive and rule-breaking behavior to the mental health diagnoses of oppositional defiant disorder and conduct disorder. Because the combination models with Social had acceptable fit indices, it was possible that the three domains were not distinct from each other. In particular it seems that the social measures may not have been assessing a distinct concept. However, as Social fit with the other domains, but Mental Health and Behavior did not fit together, the relationship between the domains was still unclear. Therefore, the preliminary model testing continued to develop the single-domain latent factor models.

### **Individual factors by domain**

#### **Mental health**

The latent factor for mental health was comprised of: the caretaker report of affective problems, anxiety, thought problems and somatic complaints; and the youth report of depression and trauma. Additionally, the caretaker report of attention problems was tested with Mental Health to assess whether attention fit better Mental Health or Behavior.

First, a model was first run with all variables except attention (Model 9), then with attention (Model 10). These models had similar fit indices, so a covarying error of the youth-reported measures was added (Models 11 and 12). The fit improved with the covarying error and Model 12 (without attention) had excellent fit. In both models, the youth reports (depression and trauma) had very low loadings, 0.22 and 0.15, which were below the 0.40 cutoff that is considered salient. A model was run without the youth reports, but removing them did not improve the fit indices (not presented in table).

### **Additional Testing of Mental Health**

Mental Health was more difficult to fit than the other domains. To better understand how the respondent was impacting the results, a caretaker latent factor was used (Model 13) even though the majority of the measures were caretaker-reported.

The results of this model demonstrated a strong effect for the respondent. The youth-reported items had high loadings on the main factor (0.92 and 0.51). The loadings of the caretaker-reported measures to the main factor were quite low (0.14-0.22). Additionally, the loadings to the caretaker latent factor were quite high (0.66-0.85). These results made it difficult to interpret the meaning of the latent construct. The Mental Health latent factor may more accurately be described as “mental health mostly as observed by the caretaker” because the reporter accounted for so much of the variation and there were more caretaker-reported measures. However, because the models with and without the youth reports had a similar fit, the model with the youth reports was used to have the broadest perspective on the construct. The factor loadings for this model are presented in Table 4.5.

### **Social**

The Social skills and problems domain is comprised of the caretaker report of social skills, caretaker report of social problems, the teacher report of social skills, and the youth report of loneliness and social dissatisfaction. First, a model was run with all the measures loading on a latent construct (Model 15). This model had poor fit. In the next iteration, the error for the two caretaker-reported measures was allowed to covary. This improved the model fit so that all fit indices were within the desired range (Model 16). This was the best-fitting model for Social and the loadings are presented in Table 4.5.

## Behavior

The Behavior domain included the caretaker reports of aggressive and rule-breaking behavior. The attention problems measure was tested with on this domain. A model of aggressive and rule breaking behavior was under-identified. Even if the loadings were set to be equal the model would not have had fit indices. With attention problems, the model had high loadings (attention = 0.79, rule breaking = 0.86, aggressive = 0.97) but was just-identified and therefore no fit statistics were produced (Model 18). In this model, most of the variation in aggressive behavior was accounted for by the latent construct; for every one-unit increase in the latent construct the aggressive behavior score increased by 0.97. To have an over-identified model that would have a spare parameter to produce fit indices, two of the observed variables were set to have equal

**Table 4.5: Final Single-Domain Models 8-10 Year Olds, Fully Standardized Estimates**

	Social	Mental Health	Behavior
<b>Social Skills: Model 16</b>			
Loneliness and Social Dissatisfaction: youth report	0.48		
Social Skills: caretaker report	0.50		
Social Skills: teacher report	0.51		
Social problems: caretaker report	0.64		
	Estimate	S.E.	
Social skills with social problems: caretaker report	0.36	0.09	
<b>Mental Health: Model 12</b>			
Depression: youth report		0.21	
Depression: caretaker report		0.88	
Intrusive thoughts from trauma: youth report		0.13	
Anxiety: caretaker report		0.81	
Somatic Complaints: caretaker report		0.72	
Thought Problems: caretaker report		0.88	
	Estimate	S.E.	
Depression with trauma: youth report	0.46	0.04	
<b>Behavior : Model 19</b>			
Rule-breaking behavior: caretaker report			0.97
Aggressive behavior: caretaker report			0.88
Attention Problems: caretaker report			0.76

P<.001 for all relationships

loadings. The range of the scales of rule breaking (0-23) and attention (0-20) were more similar to each other than either was to the scale for aggressive behavior (0-36). Therefore, rule

breaking and attention were set to have equal loadings. With this step, the model had adequate fit, although the RMSEA was outside of the acceptable range of less than 0.08 (Model 19). The loadings of this model are presented in Table 4.6.

#### **4.1.5 Summary of Preliminary Steps**

These initial steps were inconclusive in determining whether Behavior, Social and Mental Health were distinct concepts. In particular, Social was closely related to both Behavior and Mental Health. However, the latent factor that included all three domains had poor fit indices. This indicates that while Social was closely related to the other two domains, the three did not form a cohesive construct. Therefore, I chose to proceed with the hypotheses testing to explore the relationship between the three domains.

#### **4.1.6 Hypothesis testing for 8-10 year olds**

Models that included Social, Mental Health and Behavior were built to test the hypotheses.

H<sub>1</sub>: The three domains were correlated and would have a positive and meaningful covariance.

The three latent factors, Social, Mental Health and Behavior, were allowed to covary in this model.

H<sub>2</sub>: The domains were related through a higher-or second-order factor. A second-order factor was added with the original three latent factors as the reflective indicators.

The youth latent factor from the preliminary models was included in the models. All fit indices of the hypotheses testing models are presented in Table 4.7. The loadings and covariances for the final models are presented in Table 4.8 and Figures 4.1 and 4.2.

H<sub>1</sub>: The covarying model fit poorly but the covariances of the factors was very high (Model 20).

Adding a youth latent factor improved the model fit sufficiently so the indices were within the

acceptable range (Model 21). The highest modification index was for allowing aggressive and rule-breaking behavior to covary. These were the two externalizing subscales on the Child Behavior Checklist and had a very high correlation; therefore, this was a logical parameter to add to the model (Model 22).

Table 4.7: Hypotheses Testing 8-10 year olds Model Fit

Model	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
<b>Covarying Models</b>					
Model 20: Three-factor, no method Effects	456.06 (62)	0.89	0.86	.103 (.094-.112)	.082
Model 21: Three-factor, yth latent factor	259.97 (59)	0.94	0.93	.076 (.066-.085)	.045
Model 22: Three-factor, yth latent, aggressive WITH rule-breaking	207.95 (58)	0.96	0.94	.066 (.056-.076)	.041
<b>Higher Order</b>					
Model 23: Higher order, no method Effects	456.062 (62)	0.89	0.86	.103 (.094-.112)	.082
Model 24: Higher order with youth Latent	259.98 (59)	0.94	0.93	.076 (.066-.085)	.045
Model 25: Higher order with youth latent and aggressive WITH rule-breaking	207.94 (58)	0.96	0.94	.066 (.056-.076)	.041
<b>Post-hoc Revisions to Single Factor</b>					
Model 26: Single factor, youth latent Factor	530.26 (74)	0.88	0.85	.102 (.094-.110)	.069
Model 27: Single factor, youth latent and aggressive WITH rule-breaking	326.32 (72)	0.93	0.92	.077 (.069-.085)	.055

The covariances of the three factors on the final model (Model 22) were very high and ranged from 0.91 between Mental Health and Social to .98 between Social and Behavior (Figure 4.1).

The covariance values can be used to calculate the percent of shared variance between factors.

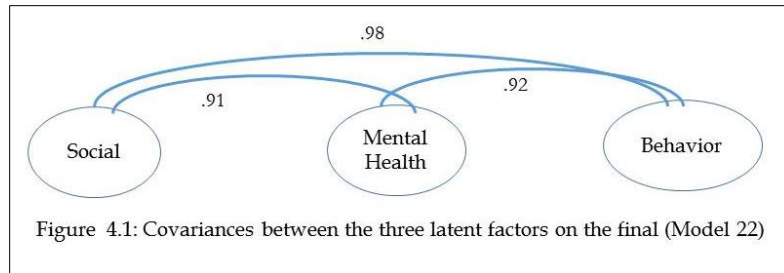
The fully standardized covariance squared is the percent of shared variance (Brown, 2006).

Therefore, Mental Health and Behavior shared 85% of their variation; Behavior and Social

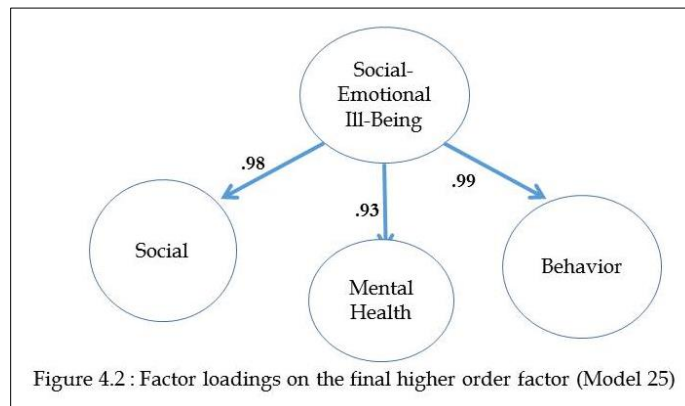
shared 96% of their variation; Mental Health and Social shared 83% of their variation. The

suggested cut-off for a covariance/correlation value of two factors to be considered distinct is

about 0.85 (Brown, 2006). These covariance values were so high that it called into question whether these factors were distinct from each other. This was consistent with the results in the preliminary state of testing two domains together; the domains did not demonstrate much differentiation.



On the higher-order factor (Figure 4.2), the standardized loadings for all three domains approached 1.0 (social skills was 0.98, mental health was 0.93, behavior was 0.99). The loadings on the higher-order factor are interpreted as for every one-unit increase in the higher-order factor, each of the first-order factors increased by most of a unit. Another way to interpret the results is that the squared, standardized loadings are equivalent to amount of the variance in the first-order factor that is accounted for by the higher-order factor. Therefore, 96% of the variance in Social, 86% of the variance in Mental Health, and 98% of the variance in Behavior is accounted for by the variance of the higher-order factor.



Because the covarying factors and higher-order factor models had the same number of degrees of freedom, the fit indices were the same. However, each model provides some unique information about these relationships.

**Table 4.8: Final Model: 8-10 Year Olds, Fully Standardized Estimates**

	Social	Mental Health	Behavior	Youth
<b>Social Skills</b>				
Loneliness and Social Dissatisfaction: youth report	.27			.56
Social Skills: caretaker report	.64			
Social Skills: teacher report	.39			
Social problems: caretaker report	.89			
<b>Mental Health</b>				
Depression: youth report		.24		.82
Depression: caretaker report		.85		
Intrusive thoughts from trauma: youth report		.15		.53
Anxiety: caretaker report		.81		
Somatic Complaints: caretaker report		.63		
Thought Problems: caretaker report		.90		
<b>Behavior</b>				
Rule-breaking behavior: caretaker report			.79	
Aggressive behavior: caretaker report			.90	
Attention Problems: caretaker report			.86	
	Estimate	S.E.		
Aggressive with Rule-breaking	.47	.058		

P<.001 for all relationships

#### 4.1.7 Post-hoc Models

The covariances of the factors for H<sub>1</sub> were so high that it was possible the domains were a single factor. Therefore, another single-factor model was run with a youth latent factor (Table 4.7).

The youth latent factor improved model fit. The modification indices were inspected as well.

Following standard protocol, only one parameter was released at a time, starting with the highest modification index that can logically be explained. The highest modification index was to allow the error of aggressive behavior to covary with rule-breaking behavior. These are the two sub-scales that comprise the CBCL externalizing behavior sub-scale, therefore they were allowed to covary. When this parameter was added to the model, the model fit was similar to the other two hypothesized models.



### 4.1.8 Intercept Invariance and Mean Differences

Measures may not function the same across groups and different groups may have different average scores for a latent factor. Difference in latent means and invariance the intercept of indicators was assessed for gender and race/ethnicity using *CFA with covariates* also referred to as *Multiple Indicators Multiple Causes* (MIMIC) models. The invariance testing was conducted on the three factor model. Model fit indices are presented in Table 4.9 and the results of the invariance testing are presented in tables 4.10 and 4.11.

#### Mean Differences by Gender

Gender was significantly related to all three domains and males had higher means on all domains (full results presented in Table 4.10). Using the unstandardized loadings, the mean of the Social latent factor was 2.70 units higher for males, 2.01 units higher for Behavior and 0.88 units higher for Mental Health. All variables were coded so that higher numbers indicate more problems in that domain. The standardized estimates (not to be confused with the completely standardized estimates used throughout this dissertation) can be interpreted as an effect size. Males were about a third (0.35) of a standardized score higher on Social, which is between a small and medium effect size. Males were almost half a standardized score higher on Behavior (0.49) and Mental Health (0.46) which is a medium effect size for gender.

**Table 4.9 : Model Fit for MIMIC Models Testing Mean Differences**

Model	Chi-square	Df	p-value	RMSEA	CFI	TLI
Gender	243.16	68	0.00	.066 (.057-.075)	0.95	0.94
Race/ethnicity	260.52	88	0.00	.057 (.049-.065)	0.96	0.94

#### Intercept Invariance by Gender

Males had higher intercepts on all of the care-taker reported indicator variables. Most of the standardized estimates were fairly modest but several were noteworthy for their effect size. In particular, the standardized estimate for gender on the teacher report of social skills was 0.54,

0.45 for the caretaker report of thought problems, and 0.50 for caretaker report of attention problems. These were medium effect sizes for the effect of gender on the score.

**Table 4.10: Mean Difference and Measurement Invariance Unstandardized and Standardized Estimates by Gender**

Factors and Indicators regressed on Gender Male is the reference	Unstandardized estimate	Standardized estimate	p-value
<b>Mean Differences</b>			
Social	2.70	0.35	<.000
Behavior	2.01	0.49	<.000
Mental health	0.88	0.46	<.000
<b>Measurement Invariance</b>			
Social			
Loneliness and Social Dissatisfaction: youth report	-0.31	-0.03	0.79
Social Skills: caretaker report	4.64	0.38	<.000
Social Skills: teacher report	6.47	0.54	<.000
Social problems: caretaker report	0.99	0.26	.001
Mental Health			
Depression: youth report	-0.13	-0.02	0.86
Depression: caretaker report	1.30	0.41	<.000
Intrusive thoughts from trauma: youth report	-0.43	-0.07	0.46
Anxiety: caretaker report	0.82	0.36	<.000
Somatic Complaints: caretaker report	0.33	0.15	0.05
Thought Problems: caretaker report	1.90	0.45	<.000
Behavior			
Rule-breaking behavior: caretaker report	1.36	0.36	<.000
Aggressive behavior: caretaker report	3.05	0.28	<.000
Attention Problems: caretaker report	2.39	0.50	<.000

### Mean Differences by Race/Ethnicity

Very few of the mean differences by race were significant although several were close to significance (Table 4.11). White youth were used as the reference group for the race/ethnicity invariance and mean difference testing. The Other race/ethnicity youth was significantly related to the Social factor and the mean of that group was 3.71 units lower than White youth. On Mental health, the Other youth had a lower mean by 0.78 units than white youth ( $p=.01$ ) and the effect was 0.41, or a medium-small effect size. African American and Hispanic youth had lower means than White youth; 0.40 units lower for African American youth and 0.47 units lower for Hispanic youth and the difference was close to significance at  $p<.05$  ( $p=.059$  and  $p=.056$ ).

Hispanic youth had a lower mean than white youth by 1.26 units which was a small to medium effect size. The Other youth had means for the Behavior factor that were 1.95 units lower than white youth on behavior which was a medium effect size (0.47).

### **Invariance by Race/Ethnicity**

Most of the intercepts of the measures were invariant by race; that is, the measures did not behave differently for children of different races. A general trend for these results was for African American youth to not vary significantly from White; for Hispanic youth to be slightly better and approaching statistical significance; and for the Other youth to be significantly better or less maladjusted than white youth. However there were some notable exceptions. The teacher report of the social skills of African American youth was statistically significant with a standardized estimate of 0.42 and an unstandardized estimate of 5.07. This translates to a score of 5.07 units higher, i.e. worse, for African American youth, which is a small to moderate effect size for being an African American youth compared to a White youth. On the caretaker report of somatic complaints, African American youth were significantly different than White youth, with a lower unstandardized score by 0.63 units and an effect size of 0.29. For Hispanic youth and Other youth the measure did not function significantly differently than it did for White youth.

**Table 4.11: Mean Difference and Measurement Invariance, Unstandardized and Standardized Estimates Race/Ethnicity**

	Unstandardized estimate	Standardized estimate	p-value
<b>Mean Differences (White reference)</b>			
<u>Social</u>			
African American	-0.98	-0.13	0.256
Hispanic	-1.64	-0.21	0.077
Other	-3.71	-0.48	0.003
<u>Mental Health</u>			
African American	-0.40	-0.21	0.059
Hispanic	-0.47	-0.25	0.056
Other	-0.78	-0.41	0.011
<u>Behavior</u>			
African American	-0.07	-0.02	0.878
Hispanic	-1.26	-0.31	0.007
Other	-1.95	-0.47	0.002
<b>Measurement Invariance (White reference)</b>			
<u>Social</u>			
Loneliness and Social Dissatisfaction: youth report			
African American	-1.63	-0.13	.238
Hispanic	-0.23	-0.02	.876
Other	-1.17	-0.09	.558
Social Skills: caretaker report			
African American	-0.31	-0.03	.803
Hispanic	-1.34	-0.11	.299
Other	-4.57	-0.38	.012
Social Skills: teacher report			
African American	5.07	0.42	.004
Hispanic	-1.58	-0.13	.322
Other	-0.37	-0.03	.891
Social problems: caretaker report			
African American	-0.54	-0.14	.162
Hispanic	-0.75	-0.20	.070
Other	-1.61	-0.42	.003
<u>Mental Health</u>			
Depression: youth report			
African American	0.02	0.00	.986
Hispanic	-0.11	-0.01	.902
Other	-0.85	-0.11	.495
Depression: caretaker report			
African American	-0.59	-0.18	.068
Hispanic	-0.67	-0.21	.055
Other	-1.70	-0.37	.008
Trauma: youth report			
African American	-.957	-0.15	.210
Hispanic	-1.70	-0.27	.016
Other	-0.93	-0.15	.352
Anxiety: caretaker report			
African American	-0.41	-0.18	.071
Hispanic	-0.35	-0.15	.163
Other	-0.92	-0.40	.003
Somatic Complaints: caretaker report			
African American	-0.63	-0.29	.004
Hispanic	-0.37	-0.17	.115

	-0.27	-0.12	.394
	Unstandardized estimate	Standardized estimate	p-value
Other			
Thought Problems: caretaker report			
African American	-0.61	-0.14	.155
Hispanic	-1.04	-0.24	.025
Other	-1.48	-0.35	.011
<u>Behavior</u>			
Rule-breaking behavior: caretaker report			
African American	0.27	0.07	.473
Hispanic	-0.57	-0.15	.160
Other	-1.31	-0.35	.012
Aggressive behavior: caretaker report			
African American	0.23	0.03	.785
Hispanic	-1.72	-0.21	.043
Other	-2.98	-0.37	.012
Attention Problems: caretaker report			
African American	-0.41	-0.09	.405
Hispanic	-1.72	-0.36	.001
Other	-2.31	-0.48	.001

#### 4.1.9 Summary of the Models for 8-10 Year Olds

Hypothesis 1 was not supported. While the domains did have a positive and meaningful covariance, the covariance values were over the critical value for considering them separate domains. Hypothesis 2 was supported. The three domains fit a model with a second-order factor. Additionally, the model with a single latent factor encompassing all of the measures fit the data once the youth latent factor was added. Therefore, the relationship between Social, Mental Health and Behavior for 8, 9 and 10 year olds who were involved with the child welfare system is best interpreted as the manifestation of a higher-order of ill-being or as a single broad construct.

These inconclusive results provide some interesting heuristic results. In this population, these domains can be conceptualized two ways to help the field better understand and therefore address the problems that these youth demonstrate. They can be understood as one broadly defined domain of ill-being, or that each child has some state of ill-being that is manifesting

almost equally as problems with mental

**Table 4.12: Demographic Description, 11-17 Year Olds**

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health, behavior and social skills. A key point across the models is the close relationship of social skills to the other domains.

The results of the tests of mean difference demonstrated consistent variation in the mean scores by gender on all three domains. Males had consistently worse scores than females. However, these results may be driven by the caretaker reported measures. . All of the youth-reported measures had invariant intercepts by gender. The results for race/ethnicity were more complicated. Generally, African American youth had scores close to those of White youth and Hispanic youth and youth of Other races and ethnicities had better, or less maladjusted, scores than White and African American youth. Again, it was only caretaker or teacher reported measures that had significant results for having non-invariant intercepts by race/ethnicity.

## **4.2 Results 11-17 Year Olds**

### **4.2.1 Population Description**

Full results are presented in Table 4.12. The total sample for the 11 to 17 year old age group, the older group, is n=1054. The sample has more females (55%) than males (45%). Caucasian is the largest race/ethnicity group (38%) with a significant portion of the population African American (27%) and Hispanic (24%). Of the 1054, 11 to 16 year-olds are almost equally represented, with each age representing about 15% of the population, however 17 year olds only represent 6% of the population. Most of the sample remained in their home of origin (67.46%) with a birth or adoptive parent. The next largest percentage of youth were in non-relative foster care placements (12%) and smaller percentages of the population in formal kinship placements (6%), informal kinship (8%) and residential or other placements (6%). The majority of children were from urban areas (84%) with 16% in non-urban areas.

## 4.2.2 Ill-Being Measures

Table 4.13 presents the measures of central tendency and dispersion for all of the measures administered to the 11-17 year olds. More youth from the sample were in the clinical range on the CBCL and YSR syndrome scales than would be expected in the general population. On the CBCL, the percent in the clinical range varied from 4.8% to 12.5%. On the YSR syndrome scales the percent in the clinical range was

Variable	11-17 year olds	
	N	%
Total	1054	100
Gender- male	471	44.69
Female	583	55.31
Race/ethnicity - White	400	38.10
African American	286	27.24
Hispanic	254	24.19
Other	110	10.48
Age		
11	170	16.13
12	156	14.80
13	165	15.65
14	166	15.75
15	167	15.84
16	164	15.56
17	66	6.26
Total 11-17	1054	100
Placement - Parent	711	67.46
Formal kinship	67	6.36
Informal kinship	80	7.59
Non-relative foster care	130	12.33
Residential/other	66	6.26
Urban	883	83.78
Non-urban	171	16.22

lower with 2.9%-7.2% in the clinical range. While fewer youth-reports placed youth in the clinical range, this population still reports more problems than would be expected in the general population.

## Social Measures

The Social Skills Rating System was the only measure that was scaled so that higher scores represented a better outcome; this scale was reverse-scored to be consistent with the other measures. There was very little missing across all scales. The caretaker report of social skills was missing 8.2% (n=86). This was the highest percentage of missing, other than the teacher report of social skills where the majority of observations were missing for this age-group. The measures were not normally distributed. The skew and kurtosis values were outside the accepted range of  $\pm 1$  for deviant peer affiliations and caretaker reported social problems. All of the skew and kurtosis was in the positive direction, indicating that there were a fewer high scores with a

long tail to the right or higher scores. Kurtosis was also positive which indicates a steeper peak. In all cases there was a larger clustering of very low scores than would be consistent with a normal distribution.

### **Mental Health Measures**

Almost all observations were present for the mental health measures with less than 4% missing on all measures. Many of the mental health measures failed to meet the assumptions of normal distribution. The skew and/or kurtosis were outside of  $\pm 1$  on the youth reports of depression (both measures), substance abuse, somatic complaints and caretaker reports of depression, anxiety, somatic complaints and thought problems. All of the skew and kurtosis values were in the positive direction, indicating that there were a few high scores with a long tail to the right and a steep peak in the low-score range.

### **Behavior**

The three measures of behavior, including attention problems, were missing 3% or less. As with the CBCL measures, several of the YSR measures had skew and kurtosis values that were outside accepted ranges. The youth and caretaker report of rule-breaking and aggressive behavior had skew and kurtosis greater than 1.0.



**Table 4.13: Description of Measures 11-17 year olds**

<b>Domains and Measures</b>	<b>N</b>	<b>Mean (SD)</b>	<b>Median</b>	<b>Range</b>
<b>Social Skills</b>				
Loneliness and social dissatisfaction: youth report	988	29.16 (10.89)	27	16-72
Social problems: youth report	1047	3.58 (2.51)	3	0-14
Deviant peer affiliation: youth report	979	9.33 (4.41)	8	6-30
Social skills: caretaker report	968	51.64 (12.19)	53	11-77
Social problems: caretaker report	1022	3.72 (3.65)	3	0-19
Social skills: teacher report	271	36.79 (11.72)	36	10-60
<b>Mental Health</b>				
Depression: youth report (CDI)	1036	9.28 (7.72)	8	0-45
Depression: youth report (CBCL)	1042	4.73 (3.99)	4	0-22
Intrusive thoughts from trauma: youth report	1040	8.56 (5.89)	8	0-30
Substance Abuse: youth report	1009	0.79 (1.56)	0	0-6
Anxiety: youth report	1043	3.10 (2.27)	3	0-12
Somatic complaints: youth report	1047	2.71 (1.41)	2	0-16
Thought problems: youth report	1047	3.87 (3.00)	3	0-14
Depression: caretaker report	1022	3.24 (3.48)	2	0-20
Anxiety: caretaker report	1022	2.31 (2.26)	2	0-12
Somatic complaints: caretaker report	1019	1.91 (2.60)	1	0-19
Thought problems: caretaker report	1022	3.40 (3.86)	2	0-23
<b>Behavior</b>				
Rule-breaking behavior: caretaker report	1022	4.77 (4.76)	3	0-25
Aggressive behavior: caretaker report	1022	8.25 (7.42)	6	0-36
Attention Problems: caretaker report	1022	5.51 (4.48)	5	0-19
Rule-breaking behavior: youth report	1047	3.91 (3.29)	3	0-18
Aggressive behavior: youth report	1047	10.05 (6.56)	9	0-35
Attention Problems: youth report	1047	6.06 (3.49)	6	0-17

### 4.2.3 Bivariate Correlations

Because attention problems could not be clearly categorized into the mental health or behavior domains, the correlations for those variables were run together (Table 4.14). None of the correlations were over 0.72 and all save one were significant at  $p < .01$ . Specifically, the correlation between youth-reported substance abuse and caretaker-reported anxiety was not significant. The correlations tended to be higher between the same reporter on different domains than on the same domain across reporters. The dark line on the table demarcates the youth and caretaker reports. For example, youth-reported depression and youth-reported trauma had a

correlation of 0.61 ( $p < .001$ ). But, the correlation of youth-reported depression and caretaker-reported depression was only 0.29 ( $p < .001$ ). Other high correlations were similarly unexpected, such as the caretaker report of attention problems and aggressive behavior (.71,  $p < .001$ ) or caretaker report of attention problems and thought problems (.72,  $p < .001$ ). The substance abuse measure had low correlations with most other measures.

**Table 4.14: Correlations of mental health and behavior measures**

	Depression (CDI) – yth	Trauma – yth	Substance Abuse – yth	Depression – yth	Somatic – yth	Thought – yth	Attention – yth	Rule-breaking – yth	Aggressive – yth	Anxiety – yth	Depression - caretaker	Anxiety – caretaker	Somatic - caretaker	Thought – caretaker	Attention - caretaker	Rule-Breaking - caretaker	Aggressive - caretaker
<i>Depression (CDI) - yth</i>	--																
<i>Trauma – yth</i>	.58	--															
<i>Substance Abuse – yth</i>	.32	.21	--														
<i>Dep. (CBCL) – yth</i>	.71	.61	.25	--													
<i>Somatic – yth</i>	.55	.51	.18	.69	--												
<i>Thought – yth</i>	.51	.57	.18	.59	.54	--											
<i>Attention – yth</i>	.60	.50	.27	.60	.50	.63	--										
<i>Rule-breaking – yth</i>	.52	.32	.48	.48	.42	.48	.49	--									
<i>Aggressive – yth</i>	.53	.41	.24	.53	.46	.64	.67	.64	--								
<i>Anxiety – yth</i>	.53	.56	.15	.64	.53	.52	.64	.32	.48	--							
<i>Depression - caretaker</i>	.27	.19	.20	.29	.18	.20	.27	.24	.24	.23	--						
<i>Anxiety – caretaker</i>	.19	.15	.06 <sup>^</sup>	.18	.13	.15	.20	.11	.19	.22	.66	--					
<i>Somatic – caretaker</i>	.19	.15	.11	.23	.21	.14	.20	.17	.20	.20	.67	.53	--				
<i>Thought – caretaker</i>	.22	.15	.10	.20	.13	.22	.22	.17	.24	.16	.71	.70	.55	--			
<i>Attention – caretaker</i>	.26	.16	.12	.18	.16	.23	.30	.23	.30	.16	.60	.64	.44	.72	--		
<i>Rule-breaking – caretaker</i>	.26	.10	.34	.18	.16	.18	.24	.45	.34	.08	.49	.39	.35	.55	.58	--	
<i>Aggressive – caretaker</i>	.24	.15	.16	.19	.16	.21	.23	.30	.38	.13	.59	.57	.45	.70	.71	.73	--

The social skills measures had more modest correlations than the mental health and behavior

measures (Table 4.15). The highest correlations were between the youth report of loneliness and social problems (0.50,  $p < .001$ ) and the caretaker report of loneliness and social problems (0.51,  $p < .001$ ). The measure of deviant peer affiliations had very low to non-significant correlations with the other measures and was not significantly associated with the care taker report of social

skills. Again, the youth and caretaker report of the same measure had a low correlation; only 0.27 ( $p < .001$ ) between the caretaker and youth report of social problems.

**Table 4.15: Correlations of Social Measures 11-17 year olds**

	Deviant peer	Social skill - caretaker	Social skill – teacher	Loneliness – yth	Social problem – care	Social problem – yth
<i>Deviant peer-yth</i>	--					
<i>Social skills – care</i>	.04	--				
<i>Social skill – teacher</i>	<b>.10</b>	<b>.21</b>	--			
<i>Loneliness – yth</i>	<b>.08</b>	<b>.23</b>	<b>.16</b>	--		
<i>Social problem – care</i>	<b>.06</b>	<b>.51</b>	<b>.14</b>	<b>.27</b>	--	
<i>Social problem – yth</i>	<b>.14</b>	<b>.16</b>	.03	<b>.50</b>	<b>.27</b>	--

#### 4.2.4 Preliminary Model Results

Fit indices for all preliminary models are presented in Appendix B. The Mental Health and Social models fit the data well once youth latent or caretaker latent factors were added.

However, Behavior fit poorly even with a latent factor for respondent. The six measures, three caretaker-reported and three youth-reported, did not fit on the same latent factor. However, a latent factor with only youth-reported measures fit the data, as did a latent factor with caretaker-reported measures. Therefore, two separate sets of models were used in the hypotheses testing phase. Separate tests were run with the youth-reported measures of behavior and the caretaker-reported measures of behavior.

##### Single Factor

A single latent factor with all of the measures loading on a latent factor did not fit the data. All of the fit indices were well outside of acceptable ranges (Model 39). Therefore, a single factor that included all three domains was ruled out.

## **Two Domains**

The two-domain latent factors fit the data poorly, even with latent factors for the respondent.

## **Mental Health and Social**

The Mental Health and Social latent factor fit the data poorly (Model 41). Adding a caretaker latent factor improved the fit indices, but they were still outside of acceptable ranges (Model 42).

While factor loadings are usually not interpreted when the model fit is poor, many of the factor loadings were below 0.40 and therefore not salient loadings.

## **Mental Health and Behavior**

A latent factor of Mental Health and Behavior fit the data poorly (Model 43) as did all modifications to the model (Models 44 - 47). A caretaker latent factor improved the fit but not enough for the fit indices to be within the acceptable range (Model 46). After the single-domain models were refined, a latent factor of Mental Health and Behavior was run using only the youth-reported behavior measures (Model 44). Then a latent factor with only caretaker-reported behavior measures (Model 45). While model fit improved over the original models, the indices were still outside the acceptable range.

## **Social and Behavior**

The measures for Social and Behavior were put into a model (Model 48) and then a caretaker latent factor was added (Model 49). Neither model fit the data well. Attention problems were included in all of the Social and Behavior models. Two more models were run. One model with the caretaker-reported behavior measures (Model 50) and one with the youth-reported behavior measures (Model 51). The model that used the caretaker-reported behavior measures had the least-bad-fit but most indices were still outside of the accepted ranges (Model 50).

## **Single Domain**

The single-domain models were able to achieve an acceptable fit to the data. However, Behavior only fit the data with the youth-reported measures or with the caretaker-reported measures. The models that included both respondents fit poorly.

## **Mental Health**

A key decision with the single-domain factors was to establish the best domain for attention. To do so, a latent factor of Mental Health was tested with attention problems (Model 53) and one was tested without attention problems (Model 52). The chi-square value was much lower for the model without attention but all indices for both models were outside the accepted ranges.

Creating a youth latent factor (Model 54) and a caretaker latent factor (Model 55) improved the model fit and the CFI, RMSEA and SRMR indices fell within the acceptable range with both models. The loadings for Model 55 with the latent factor for the caretaker report are presented in Table 4.16.

## **Social**

The latent factor that included all of the measures of social skills fit the data poorly (Model 56).

In particular, the measure of deviant peer associations had a very low loading (0.13,  $p=.01$ ). This variable was removed for lack of salience. The latent factor without the deviant peer measures had barely improved model fit indices (Model 57). A covarying error for the youth reports was added (Model 58). In that model most fit indices were within the acceptable range. One exception was the teacher-reported social skills measure. That measure had a very low loading and was removed as well. The final model excluded the teacher report and the deviant peer associations and had a covarying error for the youth-reported measures of social problems and loneliness (Model 60). The loadings of this model are in Table 4.16.

## **Behavior**

This was a difficult model to fit. Despite several reasonable modifications, the youth and caretaker reported measures were so disparate that there was not an acceptable model that included both sets of measures. Additionally, attention problems had to be tested for fit in the Behavior model because it was possible for attention problems to be an indicator of Mental Health or Behavior. The model of all six variables, including both reports of attention, fit poorly (Model 61), as did the model that left out attention problems (Model 62). Adding latent factors for the reporter improved the fit slightly but all indices were still out of range (Model 63).

However, a model of only the youth reported behavior problems had strong loadings (fully-standardized) ranging from 0.68 for rule-breaking to 0.94 for aggressive behavior (Model 66). Attention was tested with the models that only used the caretaker reports or the youth reports. With a loading of 0.72, attention problems had a slightly higher loading than rule breaking. The high loading of attention suggests that attention does belong with aggressive and rule-breaking behavior more than it does with the measures of mental health. To have fit indices for the model, attention problems and rule-breaking were set to equal because of their similar scales (Model 67). The fit indices for this model were excellent. In the model that included only the caretaker-reported measures (Model 64), attention had a strong loading (fully standardized loading =0.75,  $p < .001$ ). Once attention problems and rule-breaking were set to be equal, the fit indices for the caretaker-reported model were excellent (Model 65). The factor loadings of the Models 65 and 67 are presented in Table 4.16.

**Table 4.16: Final Models by Domain: 11-17 Year Olds, Fully Standardized Estimates**

<b>Fully Standardized Factor Loadings</b>				
	<b>Social</b>	<b>Mental Health</b>	<b>Behavior</b>	<b>Caretaker</b>
<u>Social Skills – Model 60</u>				
Loneliness and social dissatisfaction: youth report	0.32			
Social problems: youth report	0.31			
Social skills: caretaker report	0.60			
Social problems: caretaker report	0.85			
Loneliness WITH social problems – youth reports	0.44			
<u>Mental Health – Model 55</u>				
Depression: youth report (CDI)		0.78		
Depression: youth report (CBCL)		0.89		
Intrusive thoughts from trauma: youth report		0.72		
Substance Abuse: youth report		0.29		
Anxiety: youth report		0.72		
Somatic complaints: youth report		0.75		
Thought problems: youth report		0.69		
Depression: caretaker report		0.31		.81
Anxiety: caretaker report		0.22		.76
Somatic complaints: caretaker report		0.25		.67
Thought problems: caretaker report		0.24		.79
<u>Behavior caretaker report - Model 65</u>				
Rule-breaking behavior: caretaker report			0.76	
Aggressive behavior: caretaker report			0.95	
Attention Problems: caretaker report			0.77	
<u>Behavior youth report – Model 67</u>				
Rule-breaking behavior: youth report			0.71	
Aggressive behavior: youth report			0.94	
Attention Problems: youth report			0.70	

### 4.2.5 Hypothesis Testing for 11-17 Year Olds

The best fitting models of each individual domain were used to test the two hypotheses:

H<sub>1</sub>: The three domains were correlated and would have a positive and meaningful covariance.

The three latent factors, Social, Mental Health and Behavior, were allowed to covary in this model.

H<sub>2</sub>: The domains were related through a higher-or second-order factor. A second-order factor was added with the original three latent factors as the reflective indicators.

There were some changes to the list of included variables. Deviant peer associations and the teacher report of social skills were left out of the social skills model, and attention was included with behavior. A caretaker latent factor was used across domains. Because the youth-reporter model of Behavior fit the data as well as the caretaker-reporter model, two sets of hypotheses-testing models were run. Despite trying both behavior factors and trying latent factors for caretaker and youth separately, none of the models had acceptable fit. Therefore neither hypothesis was supported. Full results of the hypotheses testing models are presented in Tables 4.17 and 4.18.

#### **4.2.6 Hypothesis Testing, Caretaker Report of Behavior Covarying Models**

The first set of hypothesis testing models used the Behavior domain that only included the caretaker-reported measures (Table 4.17). All three factors were entered into a model and allowed to covary (Model 69). Without a latent factor for the respondent, the fit indices were well outside the acceptable ranges. Adding a caretaker latent factor improved the fit indices but they were still outside the acceptable range (Model 70). Using a youth latent factor improved the SRMR index into the acceptable range (.049) and the RMSEA was close to the 0.08 cut-off for an acceptable fit (Model 70a). However, the CFI, TLI and chi-square indices were not in the accepted range. The modification indices were inspected to identify any theory-informed measures that, if their errors were allowed to covary, would improve the model fit. The highest modification index was for allowing the error of the aggressive behavior measure to covary with the error of the rule-breaking behavior measure. Including this modification was insufficient to achieve good model fit (Model 71). Consequently,  $H_1$ , that the domains were related and positively correlated, was not supported for the 11-17 year olds.



**Table 4.17: Hypotheses Testing 11-17 year olds, only caretaker report in Behavior domain**

Model <sup>A</sup>	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
Covarying Models					
Model 69: Three-factor, no method effects	4181.81 (153)	0.57	0.50	.171 (.166-.175)	0.193
Model 70: Three-factor, caretaker latent factor	1161.60(123)	0.89	0.86	.090 (.085-.094)	0.072
Model 70a: Three-factor, yth latent	1271.06 (123)	0.88	0.85	.094 (.090-.099)	0.049
Model 71: Three-factor, yth latent Three-factor, yth latent, aggressive WITH rule-breaking	1117.36 (122)	0.89	0.87	.088 (.083-.093)	0.048
Higher Order					
Model 72: Three-factor, yth latent Higher order, no method effects	Not positive definite				
Model 73: Three-factor, yth latent Higher order with care latent	1161.57 (123)	0.89	0.86	.090 (.085-.094)	0.072
Model 74: Three-factor, yth latent Higher order with youth latent	1757.46 (124)	0.83	0.79	.112 (.107-.117)	0.100

<sup>A</sup>Deviant peer and teacher SSRS report removed

### Higher Order Factor

The higher-order factor with the caretaker-reported behavior measures was not positive definite and therefore the fit indices were not reliable (Model 72). Adding a caretaker latent factor made the model positive-definite but the fit indices were poor (Model 73). A youth latent factor had a similar result (Model 74). Therefore, H<sub>2</sub>, that the domains were related through a second-order factor, was not supported.

## 4.2.7 Hypothesis Testing, Youth Report of Behavior

### Covarying Models

The second set of hypothesis testing of the Behavior domain only included the youth-reported measures (Table 4.18). Results for the three covarying factors that used the youth-reported behavior measures followed a similar trend as the models that used the caretaker-reported behavior measures. The initial model fit poorly (Model 75). The model with a caretaker latent factor had a better fit (Model 76) but the indices were still outside the accepted range. Allowing the errors of the youth reports of rule-breaking and substance abuse to covary (as the highest modification index that was logically related) brought the fit indices almost into the acceptable

ranges (Model 77). Using a latent factor for the youth reports did not produce a well-fitting model (Model 78) nor did allowing the errors of the caretaker-reports of aggressive behavior and rule-breaking to covary as suggested by the highest logically-related modification index (Model 79).  $H_1$  was not supported given the poor fit of all of the models.

**Table 4.18: Hypotheses Testing 11-17 year olds, only youth report in Behavior domain**

Model <sup>A</sup>	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
<b>Covarying Models</b>					
Model 75: Three-factor, no method effects	3853.81 (132)	0.59	0.52	.164 (.159-.168)	0.145
Model 76: Three-factor, caretaker latent factor	1292.77 (126)	0.87	0.84	.094 (.089-.099)	0.053
Model 77: Three-factor, caretaker latent factor rule-breaking WITH substance abuse	590.36 (125)	0.90	0.88	.081 (.075-.088)	0.046
Model 78: Three-factor, care latent, aggressive WITH rule-breaking	1186.33 (125)	0.88	0.86	.090 (.085-.095)	0.053
Model 79: Three-factor, yth latent	1989.48 (123)	0.79	0.74	.120 (.116-.125)	0.159
<b>Higher Order</b>					
Model 80: Higher order, no method effects	3853.81 (132)	0.59	0.52	.164 (.159-.168)	0.145
Model 81: Higher order, caretaker latent	1292.77 (126)	0.87	0.84	.094 (.089-.099)	0.053
Model 82: Higher order, youth latent	1310.94 (120)	0.87	0.83	.097 (.092-.102)	0.060

<sup>A</sup>Deviant peer and teacher SSRS report removed

### Higher Order Factor

The higher order factor fit poorly (Model 80). Using a caretaker latent factor (Model 81) or youth latent factor (Model 82) improved the fit, all of the fit indices save the SRMR remained outside the acceptable range. Consequently,  $H_2$  was not supported for the 11-17 year olds either.

### Single Factor Post-hoc Testing

The single-factor model was re-run with a few changes. A caretaker latent factor was included, and deviant peer associations and the teacher report of social skills were removed from Social (Model 83). Caretaker and youth reports of behavior were both left in the model. The fit indices were closer to the accepted range but all but the SRMR were still outside the acceptable range.

The modification indices were used to identify the relationship with the highest value. The errors of the caretaker report of aggressive and rule-breaking behavior were allowed to covary (Model 84). This failed to improve the fit enough to bring the indices within the appropriate ranges (Table 4.19).

**Table 4.19: Post-hoc Revision to Single Factor**

Model <sup>A</sup>	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
Model 83: Single factor, care latent factor	2444.97 (180)	0.81	0.78	.109 (.106-.113)	0.064
Model 84: Single factor, care latent, aggressive WITH rule-breaking	2219.85 (179)	0.83	0.80	.104 (.100-.108)	0.063

<sup>A</sup>Deviant peer and teacher SSRS report removed

### Post-hoc Testing of Three-Domain Models

In contrast to the well-fitting model for the 8-10 year olds the models for the 11-17 year olds were much poorer fitting. There were two potential explanations. First, the three domains for the older group were not as closely related as they were for the younger age group. Second, some spurious issue was disrupting what would potentially be a good fit. To rule out the spurious explanations and to either support or undermine the conclusion that the domains are differently related in older youth, some additional post-hoc testing was conducted. Two possibilities were tested. The first possibility was that the age range of 11 to 17 years old was too large with too much variation in the patterns of responses to produce a good-fitting model. To test this possibility, the correlations of the measures for only 14-17 year olds, or approximately high-school aged youth, were compared to the correlations for the whole sample and a the final hypothesis-confirming models was run using only the 14-17 year old group.

The second possibility is that having more youth reports increases the chances for disagreement between the youth and caretaker reports making the models more difficult to fit. This possibility was tested by using only the youth-reported measures in a three-factor and higher-order model.

More non-CBCL measures were included in the youth-reported measures, which provided a broader perspective on each domain than just assessing the relationships between the CBCL subscales. The models for Social and Behavior as individual domains with only the youth-reported measures were under-identified. Therefore, just confirmatory analyses of the youth-reported measures in a covarying factors model and as a higher-order factor were tested.

### **Post-hoc Testing Results**

These post-hoc tests were intended to lend credibility to the conclusions rather than be a separate set of tests. The correlations of the 14-17 year olds were similar to the full sample of 11-17 year olds. The post-hoc model that included only the youth-reported measures (Models 89-92) and the models that included only 14-17 year olds (Models 85-89 and Model 91) had similar poor-fitting results as the models with the full sample and caretaker and youth respondents. Results are presented in Appendices C and D.

### **4.2.8 Summary of the Models of the 11-17 Year Olds**

The results for the 11-17 year olds were very different than the results for the models of the 8-10 year olds throughout the testing process. Most importantly, the hypotheses were not supported for the 11-17 year olds. The domains did not fit the data as covarying models or as a higher-order factor. In the preliminary testing phase, the two-domain models did not fit well together. Additionally, achieving a good fit for the single-domain models required more adjustments to the model than with the younger age-group. In particular, the youth and caretaker reports of behavior were so disparate that none of the models that included both sets had acceptable fit. By only using the 14-17 year olds and then only the youth reports, the post-hoc testing added support to the conclusion that the concepts were more distinct for older children than for the younger children.

## **Chapter 5: Discussion and Implications**

This investigation expands the knowledge base on the key domains of social-emotional ill-being for 8-17 year old child welfare-involved youth in several important ways. Well-being is one of the three stated goals of the child welfare system and recently the Administration of Children Youth and Families has highlighted the importance of social-emotional well-being for maltreated children and youth. However, well-being in general and social-emotional well-being in particular remain undefined in the federal statutes or guidelines. Additionally the field lacks consensus on the essential domains of either type of well-being. Outside of the child welfare field, there is general agreement that well-being is a positive state, but this definition has yet to be adopted by child welfare researchers, policy makers, or practitioners. The field is further limited by the available and commonly-used measures which, almost exclusively, assess ill-being rather than well-being.

This investigation furthers our understanding of social-emotional ill-being and clarifies the relationships between mental health, behavior and social skills. These are three of the commonly-discussed domains of social-emotional well-being. These findings contribute to the literature by creating useable age-specific definitions of what should be assessed to measure social-emotional ill-being. This is an important clarification because of the increasing focus on the social-emotional well-being, or really ill-being, of child welfare-involved children.

There are several strengths to the particular approach used in this investigation. The NSCAW II dataset included subjects from 42 states and the sample represented all the stages of involvement with the child welfare system from investigation, through substantiation, and removal to foster care. There were youth who had never been reported for maltreatment before and youth who had

one or more previous maltreatment reports. This is a more diverse sample than would usually be available in a single dataset. Additionally, the NSCAW II administered a variety of measures across several social-emotional domains. The analytic approach of structural equation modeling allowed for the specific relationships between latent factors to be modeled and analyzed. This is an important feature to understanding the nature of the relationships between these domains.

The key findings of this dissertation are summarized below and organized by the major themes: ill-being in this population and the relationships between the three domains; the variation in relationship by age-group; the discordance between the youth and caretaker reports; the invariance of the domains by gender for the 8-10 year old age-group; and the differences by race/ethnicity. Practice, research and policy implications follow the discussion of the results.

## **5.1 Ill-Being and the Relationship between Mental Health, Social and Behavior**

Aim 1 of this dissertation was to revise a theory of the relationships between the domains of mental health, social skills and behavior for child welfare-involved youth. The preliminary theory set out in Chapter 2 was:

In a child welfare-involved population, social skills, mental health and behavior are related domains.

The results showed that these relationships varied by age. For 8-10 year olds these domains were closely and positively related. This means that for the younger youth there was a dominant pattern of a youth being consistently high (or low or in the middle) across all three domains. Therefore, if a youth had a high score on the Behavior factor, his or her scores on the Social and Mental Health factors tended to be high as well. In this age-group, the three domains can be understood as facets of a single broad concept. They can also be understood as reflecting a

higher-order concept that we will refer to as social-emotional ill-being. The youth's social-emotional ill-being was then manifested fairly equally in her behavior, mental health and social skills.

For the older age group, 11-17 year olds, the model with all three domains did not fit the data which means that the domains were not closely related. Youth who had a high score on the Mental Health factor did not consistently have high scores on the Social and Behavior factors. Given the high percentage of youth in the clinical range on the individual measures, it is probable that most youth had high scores in one or two domains but not in all three domains. Without the consistent pattern of similar scores across the three domains, the models with all three domains would not fit the data. Therefore in this age-group, social-emotional ill-being was not a clearly defined construct.

The two age groups provided a clear contrast in their representation of the relationships between mental health, social skills and behavior. The results show that for younger youth, there is a cohesive concept of social-emotional ill-being, but that older youth do not experience an underlying domain of social-emotional ill-being in the same way. Therefore, I would revise the preliminary theory to:

The relationship between mental health, social skills and behavior is age-dependent. In younger children these domains are closely related, but starting around the age of 11 years old these are three distinct domains.

### **5.1.1 Emotional Development and Ill-Being**

The difference between these two age groups suggests a developmental shift in emotional understanding. The 8-10 year olds are in the developmental stage of late middle-childhood (Blume & Zembler, 2007). The 11-17 year old age-group covers the span of adolescence. Significant physical, cognitive, social and emotional development occurs during adolescence.

These findings may be tapping into the youth's development of emotional awareness or being able to distinguish one emotion from another. Emotional awareness is a component of emotional intelligence which is defined as:

[Emotional intelligence is] The subset of social intelligence that involves the ability to monitor one's own and other's feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions. (Salovey & Mayer, 1990), pg 189)

What could be happening is that in younger children, the ill-being they experience is not specific enough to be categorized into any particular direction, although it strongly manifests through behavior which is closely associated with social skills and mental health problems. As they mature, these feelings of ill-being are more distinct and are more clearly distinguished as sadness, anxiety, loneliness, aggressive behavior and so forth. These feelings manifest more strongly in some areas for some youth than in others. This results in a more distinct relationship between the three domains for older youth.

These findings are consistent with research on the functional and structural changes in the brains of adolescents. Until recently there was a fairly straightforward theory of adolescent's impulsive behavior and increased risk of mental health problems that focused on the slower development of the prefrontal cortex in conjunction with changes in the limbic system (e.g. Steinberg, 2008). However, recent neuro imaging results, particularly functional magnetic resonant imaging (fMRI) have not supported this theory (Crone & Dahl, 2012).

There have been at least two major developments in the last 15 years that have changed the landscape for understanding the brain and behavioral changes in adolescence. First, longitudinal MRI studies have increased our knowledge of the structural development of the brain. These studies have resulted in a more nuanced understanding of the structural changes the adolescent



brain undergoes. The second major change has been that with the use of fMRI scientists are able to observe the areas of the brain that are recruited as people perform specific tasks and how the areas recruited vary between childhood, adolescence and adulthood. Together, the advances from these two scientific approaches have suggested a more complex and interactive development than was accepted as recently as the early 2000s.

The structural changes include increases in the volume of white matter and decreases in the volume of gray matter that seems to represent a pruning or synaptic reorganization matter (Blakemore & Choudhury, 2006). The changes in volume may follow a curvilinear pattern rather than a linear one (Blakemore, 2012b). Other recent studies have examined the changes in cortical thickness throughout adolescence and found that different areas of the brain develop at different speeds (Blakemore, 2012b). At this time, the implications of these structural changes is not entirely understood but it does support the theory that adolescence is a critical and sensitive period of neurologic development.

The studies of the functions of the brain have demonstrated that there are dramatic changes in what has been termed the “social brain” or social brain network (Burnett, Sebastian, Kadosh, & Blakemore, 2011). The social brain network is a collection of regions of the brain that are consistently involved in social cognition (Blakemore & Mills, 2014; Burnett et al., 2011). These areas are the medial prefrontal cortex, the anterior cingulate cortex, the temporo-parietal junction, posterior superior temporal sulcus, fusiform face area, occipital face area, anterior temporal cortex and the amygdala (Burnett et al., 2011). Many of these areas exhibit functional and structural changes during adolescence (Blakemore, 2012a).

Social cognition is understanding and making sense of the social interactions with and of others (Frith & Singer, 2008). There are several distinct components of social cognition including face processing, understanding others' mental states and social emotional processing (Blakemore & Mills, 2014). These skills, which until recently were thought to plateau before adolescence, continue to develop until adulthood (Blakemore & Mills, 2014). For example, one study examined participants' ability to make adjustments to a visual display from their perspective and by taking into account the perspective of another person. While the ability to adjust the display from their perspective improved until mid-adolescence, the ability to adjust the display while taking another person's perspective into account continued to improve past mid-adolescence.

Additionally, adolescents are more responsive to peers acceptance or approval than younger children or adults (Crone & Dahl, 2012). This is important because the social domain is an area of high risk and reward in adolescence in that they are more motivated by peer and other social approval and are more sensitive to rejection. Therefore, behaviors that are currently viewed as risk-taking or reward-seeking behaviors (substance use or sexual experiences) may be driven by the social implications such as acceptance, rejection or admiration (Crone & Dahl, 2012). One manifestation of the importance of the social domain is the stress that results from isolation or rejection in adolescence (Blakemore & Mills, 2014). Social stress may also lead to increased vulnerability to mental illness through the mechanisms of social-stress-related production of glucocorticoids and the changing regulation of and sensitivity to glucocorticoids in adolescence (Perlman, Webster, Herman, Kleinman, & Weickert, 2007). This is one explanation for the increase in mental illness in adolescence (Blakemore & Mills, 2014).

Behavioral studies have also shown demonstrated dramatic changes in adolescence. One study demonstrated that the ability to recognize one's own emotions, or trait emotional intelligence,

may be variable through the ages of 10 and 11 and stabilizes around ages 12-13 (Keefer, Holden, & Parker, 2013). Additionally, children's ability to recognize more complex emotions in others continues to significantly improve until at least age 10 and they may experience some additional gains throughout adolescence (Costa & Faria, 2015; Costa & Faria, 2015; Gao & Maurer, 2010; Vetter, Leipold, Kliegel, Phillips, & Altgassen, 2013). The age range of 10-12 years old seems to be a period of development for emotion recognition.

While there is still much to learn about the development of the adolescent brain, there are dramatic and not entirely understood changes that occur throughout adolescence. Taken together, these changes help explain the differences found in this dissertation between pre-adolescents and adolescents in the manifestation of social skills, behavior and mental health. Adolescence is a period of dynamic growth where changes in the brain result from interactions between brain development and environment. This interactive development may occur differently for individual youth depending on the experiences that shape their development.

## **5.2 Discordance between Youth and Caretaker Reports**

The caretaker and youth reports had some amount of disagreement. This disagreement was reflected in the low to moderate correlations on different measures within domains, even when the measures were presumably assessing the same construct. This finding was consistent across all analyses. The differences between youth and caretaker responses were significant enough that in order to represent the relationships in the data, all of the models had to account for the respondents. Therefore, we can reasonably conclude that there was a significant amount of disagreement and inconsistency between these two reporters.

There are several different aspects of the discordance between the youth and caretaker report that are important to consider. First, in the general population there is a discrepancy between the reports of parents and children. Second, the discrepancy is not predictable or consistent across or even within studies. In some cases, parents report more problems than their child, and in some cases parents report fewer problems. Third, maltreating parents assess their children's behavior less accurately and more harshly than non-maltreating parents making them less reliable than the average parent in reporting on their child's behavior.

Discordance between youth and parent reports in the general population is an accepted fact in psychology (Barker, Bornstein, Putnick, Hendricks, & Suwalsky, 2007; Berg-Nielsen, Vika, & Dahl, 2003; Pieper & Garvan, 2015). If parents consistently under-reported or over-reported problems then it would simply be a matter of adding or subtracting from a parent's report to arrive at the true score. However, the patterns of discordance are inconsistent. For example, in a community sample assessing adolescent's internalizing, externalizing and total behavior problems, about two-thirds of the youth reported more problems than mothers reported; but for the other third of the dyads mothers reported more problems (Barker et al., 2007). It is not just on emotional issues that parents are inaccurate reporters for their children. In a study comparing the Health Related Quality of Life of children with general injuries or brain injuries to healthy controls, parents tended to assess the situation more positively than the children (Pieper & Garvan, 2015). Additionally, the discordance varied over time and across subscales. Depending on the time-point post-injury and the specific subscale, 50-60% of the time the child's scores were higher, i.e. indicated worse quality of life. The scores were the same for 9-22%, again depending on the measure and time since injury, and the child's report was better, i.e. lower, 18-40% of the time (Pieper & Garvan, 2015). Age is a challenge to the method of measurement but

not necessarily a barrier to participation. Children as young as 3 years old have responded to questions about their emotions and behaviors on a measure that uses puppets to ask questions (Mackenbach et al., 2014). In conclusion, parents in the general population are often accurate reporters of their children's mood and behavior but it is difficult to be certain when they are accurate.

Beyond the discordance between parents and children in the general population, maltreating or high-risk parents may be less accurate judges of their children's behavior than other similar parents. Studies have shown that physically maltreating parents tend to rate their children more harshly than a neutral observer rates the child, and more harshly than similar but non-maltreating parents (Lau, Valeri, McCarty, & Weisz, 2006; Reid, Kavanagh, & Baldwin, 1987). Maltreating parents reported greater frequency of behavior problems (Bradley & Peters, 1991); more aggressive and hyperactive behaviors (Reid et al., 1987); and reported more externalizing problems (Lau et al., 2006). In one study maltreating mothers even tended to underestimate their children's intelligence (Reid et al., 1987). These studies suggest that maltreating parents may have unrealistic expectations of their children or that these parents tend to focus on negative behaviors and therefore perceive the negative behaviors as more prevalent than they actually are.

Foster parents and other substitute caretakers present an additional wrinkle to the issue of the reporter. There seem to be few studies assessing foster parents perspectives on the youth's behavior. However, the few that were located showed a consistent pattern of non-relative foster parents rating youth more harshly than kinship parents (Shore, Sim, Le Prohn, & Keller, 2002; Timmer, Sedlar, & Urquiza, 2004). In one study the number of problem behaviors was similar on the Eyberg Child Behavior Inventory but the foster parents reported a greater intensity of problems than kinship foster parents (Timmer et al., 2004). In these studies it is possible that

there was some selection bias in the youth who were in kinship care. However, relatives may also have been more forgiving of or realistic about the children's behavior than strangers.

For children currently engaged with the child welfare system, two studies confirm the problem of discordance among child welfare-involved youth and parents/other caretakers (Hwang & Lee, 2013; Lanier, Guo, Auslander, Gillespie, & Kohl, under review). One study of parents and children where the child remained in-home found a significant discordance on a health-related quality of life measure (Lanier et al., under review). Parents tended to be more positive about the children's experiences than the children were. One study of youth who had been in foster care found high levels of agreement on objective measures such as services received, but low agreement on the child's emotional state and prosocial behaviors (Hwang & Lee, 2013). In this study, the agreement between youth and a birth parent (following reunification) was highest, with youth and residential caretakers demonstrating the greatest discordance.

Youth may also answer less honestly in potentially untrustworthy situations. In a study of youth in different levels of restrictive placements, most of which were for behavioral or emotional problems, the youth seemed to be minimizing their behaviors on a self-report measure. Only 28% of the youth reported-scores fell into the clinical range while 74% of the parent and residential caretaker reports did (Handwerk, Larzelere, Soper, & Friman, 1999).

In this study, the model results highlighted the discordance between youth and caretakers in two distinct ways. One representation of this was the inconsistent loadings of the indicator variables on the latent factors. The loadings represent the amount of the variance in the indicator variables that is accounted for by the latent factor. For example, in the mental health domain, the loading of anxiety represented the amount of the variance in the anxiety measure that was a result of the

mental health latent factor. The loadings on a given factor tended to be strong for the youth-reported or the caretaker-reported measures, but not both. The second way the discordance was demonstrated in the models was in the model fit. The easiest way to understand this is that the model produces a matrix of hypothetical data based on the relationships in the model. That model-dataset is compared to the actual study data and the differences between these two matrices are represented in the fit indices. To achieve good fit indices, or a high correspondence between the model-produced data and the actual data, a latent construct for the respondent was needed to account for the similarities in the responses between the measures from the same respondent. Without this latent construct for the respondent, there was too much unaccounted-for variation in the data.

The most drastic example of this discordance was on the behavior domain for the 11-17 year old age group. In that domain, the youth and caretaker reports were so inconsistent that good model fit was impossible when both sets of responses were included. One possibility for this poor fit may have been the inconsistencies in the youth vs caretaker responses rather than just a weak relationship. The youth-report had higher mean scores than the caretaker-report for aggressive behavior and attention problems but lower scores for rule-breaking. Most likely this difference results from some of the internal aspects of attention problems that caretakers are less attuned to and aggressive behaviors that occur away from the caretaker's purview. This also demonstrates the inconsistent nature of the discrepancy between the two reporters.

All this is a complex and technical way to say that the results of this dissertation are consistent with previous studies in the general and child welfare-involved populations. This study found discordance between youth and caretaker reports on all domains. Additionally, the patterns of

higher scores were unpredictable with neither the youth nor caretaker consistently reporting higher scores.

### **5.3 Mean Differences by Gender**

Gender was a significant predictor of mean scores for the Behavior, Mental Health and Social latent factors for the 8-10 year old. Males were higher on all domains. The strongest effect was on Behavior (0.49) but there was also a moderate effect for gender on Social and Mental Health. The results suggest that males demonstrate more problems on all three domains. However, when the individual items were examined some different trends emerged. While all of the caretaker-reported items demonstrated differences by gender; the three youth-reported items did not demonstrate a difference by gender. From this small sample, boys and girls rate themselves similarly but caretakers rate boys more harshly. The effect of gender on the differences on individual measures ranges from a small effect (0.15) for somatic complaints to medium to large effects for attention problems (0.50) and for the teacher report of social problems (0.54). While this is inconclusive because the youth only reported on three measures, it adds support to the need for a youth report and to the general dissonance between youth and caretaker reports.

Other studies have found similar results in studying parents' perceptions of behavior by the gender of their child. In a study of parents and youth recognizing ADHD, the researchers found that it was important to include a youth-report measure of anxiety. Otherwise, girls were under-diagnosed because parents did not identify internalizing symptoms as accurately as they identified externalizing symptoms such as rule-breaking (Skogli, Teicher, Andersen, Hovik, & Øie, 2013). These differences may be related to gender expectations and socialization around emotional expression. Parents expect different responses from their sons and daughters and respond in ways that shape their children's responses (Cassano & Zeman, 2010). They tend to



discourage their sons from displays of emotion and allow more emotional expression from their daughters. This socialization process may inhibit boys' willingness to display a range of emotions to their parents and result in parents poorly interpreting what boys are experiencing. Consistent with this conclusion, in a sample of low-income parents (or other legal guardians) and children aged 9-15, boys reported less open communication with their parents than girls (Xiao, Li, & Stanton, 2011).

## **5.4 Hispanic Youth**

The 8-10 year old Hispanic youth had significantly lower mean scores on the latent factor for Behavior than White or African American youth ( $p=.007$ ) and slightly lower latent mean scores that approached significance for the Mental Health ( $p=.056$ ) and Social latent factors ( $p=.077$ ). This finding is consistent with other research that has found that Hispanic persons tend to have better health than White and African American persons of similar socio-economic standing. Much of this research has been conducted on adults and the effect seems to be strongest in immigrants and diluted for subsequent generations that are born in this country. The research that has been conducted on adolescent mental health is mixed. Studies have found that foreign-born Hispanic teens have lower reported rates of mental health disorders and suicide (Browner-Elhanan, 1997; Hovey & King, 1997). However, a recent report from the CDC showed that Hispanic teens had higher rates of depression and suicidality than White or African American teens (Kann et al., 2014). In this sample, we have not distinguished nativity or generational status; therefore, the findings may be muddled by including native-born and immigrant youth as a single group.

## **5.5 Limitations**

The limitations of this dissertation are the sampling and measures in the NSCAW II dataset, and the assessment of model fit in structural equation modeling. While it has many strengths, the dataset has three limitations that are relevant for this dissertation. First, without the weights the NSCAW II is a diverse but non-random sample of the child welfare-involved population. The most obvious problems with the sample are that youth from urban areas of seven large states are over-represented, and youth from rural areas and most of the other states are under-represented. Second, the measures that were selected for the NSCAW II focus on ill-being making it impossible to assess well-being. Additionally, there were fewer youth-reported measures for the 8-10 year olds than for the 11-17 year olds. This difference meant that the models for the two age-groups were substantially different.

Because of the variety of fit indices and the lack of firm guidelines for the indices in structural equation modeling, model assessment, interpretation, and comparison of less-than-excellent models is somewhat subjective. Many of the models in this dissertation could be categorized as “adequate but not great” fit. The indices were mostly in the adequate to good range but the chi-square test was significant on most models. Additionally, particularly on the larger models, there were many areas of localized strain that indicate unidentified relationships between the indicator variables. As the purpose of this dissertation was to understand the domains rather than assess a specific measure for use this was an acceptable problem but remains a limitation.

## **5.6 Implications**

### **5.6.1 Practice**

In direct practice, a key part of helping child welfare-involved families is accurately ascertaining the youths problems and then identifying appropriate services. What these results have

demonstrated is that for older youth, mental health, behavior and social problems function independently. To accurately identify the youth's needs, each domain should be screened or assessed independently. However, for younger youth, if they are experiencing a problem in one area, for example they are having behavior problems, then they are most likely having problems in the other two domains as well. For identifying problems, a more general social-emotional measure should accurately identify youth who are experiencing ill-being. However, a general measure, particularly if it relies on one domain more heavily than the others, may not be sufficient to guide the selection of appropriate services. Instituting standardized screenings for each domain to assess for problems would help identify the youth who need specific services or to help focus services such as individual therapy.

Practitioners need to reconcile the discordance between youth and caretaker perspectives and the differences in how caretakers assess boys and girls. Throughout their work with families, case managers and therapists must make sense of conflicting reports and decide whether the youth or parent is the most accurate authority on the youth's mood and behavior. The difference in perception between youth and caretakers, which may be exacerbated for maltreating parents, may be a significant and unrecognized problem for child-welfare involved families and a challenge for professionals who work with these families. To address these discrepancies, therapists and other professionals should use youth reported-measures and ask youth how they are feeling. They must also believe that the youth's report is as equally valid as the caretaker's. This is the case even when the youth's report conflicts with the parent or other caretaker's report.

Additionally, working with youth on managing their individual deficits, such as behavior problems or depression, is a key component of child welfare services. However, professionals may need to do as much work helping parents and other caretakers develop reasonable and age-

and gender-appropriate expectations for children and youth as they do working directly with the youth. Additionally, caretakers may need to be more attentive and sensitive to the youth's emotions so they are better informed of when the youth is experiencing problems. This work with parents and caretakers may be an important, and mostly missing, component of improving and sustaining a more positive situation for the whole family.

### **5.6.2 Research**

These results have important implications for researchers interested in studying the well-being, or more likely ill-being, of child welfare-involved youth. For the purposes of research the presence of ill-being for younger youth can be accurately assessed using a fairly general measure that touches on mental health, behavior and social skills. However, for older youth these domains need to be considered and measured separately. A more general measure may only identify the most troubled youth who are struggling on all three domains. In practical terms, for 8-10 year olds using the Child Behavior Checklist is probably identifying most youth who are experiencing problems. Continuing to use the CBCL total scale, which includes the Attention and Thought Problems subscales, will probably accurately identify the youth who are experiencing ill-being. The accuracy of using the Internalizing and Externalizing Behavior subscales as a proxy is more questionable. Attention and Thought Problems are not included on either scale and both scales loaded strongly onto the latent factors.

For older youth, who may only have problems one or two areas, a youth's CBCL score may not reach the clinical threshold despite the youth experiencing significant problems in a domain. Therefore, behavior, mental health and social skills should be assessed and considered separately and the youth reports should be used in addition to the caretaker report. To understand the relationship between ill-being on these domains and particular outcomes of interest using

ordinary least squares regression, behavior could be measured by summing the raw scores of the three CBCL subscales that constitute the Behavior latent factor in this study. It is possible that an average of the T-scores on these three measures would have a similarly accurate result. To assess for mental health problems, the raw score for Thought Problems could be added to the sum of the raw scores of the existing Internalizing Behavior subscales. Again, it is possible that averaging the T-scores, including Thought Problems, would also be effective. Social skills is the most complicated to assess using existing measures and these results are less helpful in identifying a straightforward solution for social skills than for the other domains. The caretaker report of social skills (which is the CBCL Social Problems subscale) had the highest loading onto the latent factor. Using the CBCL Social Problems subscale might produce useful results. However, given that adolescents often have extensive social connections and experiences that their parents or other caretakers are unaware of using the youth's report of either social problem or loneliness and dissatisfaction should be considered. The main limitation to using the CBCL in this modified manner is that the results might not be directly comparable to other studies. However, as the population could be compared to the populations in others studies using the traditional Externalizing, Internalizing and Total Problems scales this is a small limitation. Additionally, these results could be used to develop a shorter measure or at a least screening tool of ill-being that included all three domains and a child and parent report. A screening tool would also be useful in practice to identify youth who needed additional assessments. The loadings on the models identify the aspects of each domain that are most closely associated with the latent construct. On the Behavior latent factor, aggressive behavior consistently had high loadings in all models so defiant or aggressive behaviors should figure prominently into a screening tool. Additionally, illegal or deviant behaviors and impulsivity should be assessed. For mental health,

thought problems had a consistently high loading. Including that along with some screening questions for depression and anxiety would probably identify the youth who needed additional assistance. The youth report is particularly important for the mental health and social domains as caretakers seem to be less informed on those domains than on youth's behavior. The social domain should include youth's experiences with peers along with whether they are developing appropriate social skills.

The discordance between youth and caretaker reports is another issue that has implications for research. The unpredictable discordance has not been accounted for in research on child welfare-involved families. To accurately capture the experience of youth, researchers should consider incorporating the youth's reports whenever possible. Youth reports could be used in conjunction with the caretaker reports because relying on the caretaker reports seems likely to misrepresent the experience of the youth in unpredictable ways. Using the youth report more also addresses an issue in longitudinal studies where the change in raters between waves is a documented problem (Guo & Bollen, 2013). Some researchers may argue that administrative records may also address the issue of discordant raters; however, administrative data has many of the same flaws as adult-reported measures. An administrative record for minors is created when an adult seeks some kind of care for the youth. The adult may be a parent or teacher but the need for services is still driven by the perceptions of adults.

The findings on gender invariance suggest several areas for additional research to better understand this issue. It is unclear whether this difference results from parents misunderstanding what their boys are experiencing and what typical age- and gender-appropriate is, or whether the boys are comparing their own experiences to their peers and their whole peer group tends to be

problematic. For this population, measures may need to be assessed for gender invariance to capture the experience of boys and girls accurately.

### **5.6.3 Policy**

These results suggest that to improve child well-being, child welfare policy should include a standard and comprehensive social-emotional assessment that includes a youth and caretaker report. However, integrating a comprehensive assessment into the laws that guide the child welfare systems is likely to be a challenge. The federal laws provide a structure and guidance for policies at the state or county level. There have been three major laws in the last 15 years that have some protection or promotion of well-being. Each of the laws that has been passed since the Adoption and Safe Families Act (ASFA), which introduced well-being as one of the goals of the child welfare system, has pushed the system toward additional protection and support for well-being.

Each law has some provisions that promote well-being or support the reduction in ill-being. The Fostering Connections Act of 2008 supports foster children's long-term connections to their relatives. The law focuses on keeping children in foster care connected to relatives by prioritizing relatives as a placement, requiring child welfare systems to actively seek out relatives as placements, and to make reasonable efforts to keep siblings together either through placements or visits. Promoting positive and stable family relationships is one way to promote children's well-being.

The laws may support the reduction in ill-being by improving access to assessments and services. The 2011 renewal of the 2006 Child and Family Services Improvement and Innovation Act introduces the term *emotional trauma*. It refers specifically to emotional trauma that is “associated with maltreatment and removal from the home” as something that should be

“monitored and treated” within state plans for healthcare services for children in foster care. Identifying and treating emotional trauma will likely reduce some aspects of ill-being such as mental health problems or behavior problems. By including emotional trauma, the law expands the services that must be provided. Additionally, this law identifies possible goals for demonstration projects including “meeting the comprehensive health and mental health needs of children in foster care....and when appropriate, addressing the issue of trauma”. States or other administrative entities could apply for demonstration funding to test different approaches to addressing the health, mental health and trauma-related problems. The law also underscores the commitment to well-being by requiring improved training for case managers around decision making related to safety, permanency and well-being. While this provision is not well-explained, states could take advantage of this vagueness to institute well-being screenings.

The 2014 Preventing Sex Trafficking and Strengthening Families Act requires the development of a “reasonable and prudent parent standard to allow a child in foster care to participate in age-appropriate activities”. This would also seem to promote well-being of children by allowing them to engage in child-like activities.

Individually, each of the laws adds additional requirements and support for promoting well-being or reducing ill-being. Taken together, they target reducing ill-being from several different angles. However, there are significant gaps in the efforts to promote well-being and reduce ill-being. A significant limitation of all the laws is that the scope of the law is restricted to children in foster care, or another formal out-of-home placement. The lack of attention to children who are maltreated but remain in their home, including those receiving services from the child welfare system, is surprising. These children are the majority of the child welfare-involved population and are at risk for future maltreatment and removal. Focusing only on children in



foster care is a significant limitation of the current laws. Without guiding federal policy, each state can determine what standards of care to apply to children who are investigated for maltreatment but never enter foster care.

Additionally, none of the laws set out a clear plan for assessing and supporting well-being. An assessment system could be implemented under the laws but one is not required nor are guidelines presented for what a comprehensive assessment would include.

In addition to the laws, there are federally-required reports. Most of the required reporting, such as AFCARS, focus on indicators of safety and permanency for children in foster care. However, the Child and Family Services Review (CFSR) includes children who remain in the home but are receiving services following a maltreatment investigation or assessment. The CFSR includes two goals that could reduce ill-being:

Children receive appropriate services to meet their educational needs.

Children receive adequate services to meet their physical and mental health needs.

Unfortunately, these goals only apply to children's identified needs. Therefore, for these goals to apply children's needs must be identified through voluntary screenings or assessments.

Making major changes to the child welfare system can be a challenge. However, identifying points in the patch-work of laws and required reports where well-being assessments could be inserted is possible and probably a more fruitful approach. The most promising points of change seem to be the "monitoring and treatment of emotional trauma" requirement in the Child and Family Services act and the service requirement of the CFSR. For example, specific guidelines for a trauma assessment could be developed using a broad definition of trauma-related problems that encompassed several domains that aligned with well-being. Then it would be possible to

implement a standard screening for social-emotional ill-being under the umbrella of assessing problems associated with trauma. Because child welfare agencies need to address identified problems to have a good report on the CFSR, more children might receive appropriate well-being related services.

The Children's Bureau could also specify guidelines for how to monitor and treat emotional trauma or how to identify the mental and physical health needs of children so that such needs may be met. Even if the agency is reluctant to require a specific screening or assessment, guidelines of what a screening or assessment should include would be a vast improvement over the current grab-bag of possible measures.

The lack of mention or support for parents in all of these laws is notable by its absence.

Maltreatment, ill-being and well-being occur in the context of relationships. Most of the child-welfare involved parents need additional support to better care for their children. However, the laws do not establish expectations of support for parents. Given the focus on children in foster care, the parents seem to be an afterthought to the laws rather than a necessary partner in improving safety and permanency. While children and youth's individual problems are part of the challenge in child welfare-involved families, changing child or youth behavior is probably insufficient to change the dynamic in the family. For example, because of the tendency of maltreating parents to assess their children's behavior more harshly more support may be needed to help parents develop appropriate expectations and accurate assessments of their children's behavior. A promising approach is behavioral parent training programs. Part of the training in high-quality programs focuses on helping parents reframe how they view their children's behavior and learning about developmentally appropriate behaviors.

#### **5.6.4 Subjective Well-Being**

The concept of subjective well-being ties these many of these themes together. The children's rights perspective on subjective well-being contends that as equal human beings with the attendant rights of humans, children's perspectives on their own welfare are essential (Ben-Arieh, 2005). Additionally, as the earlier discussion has shown, the youth perspective is particularly valuable because it is distinct from the adult perspective. Therefore if we are to accurately study the experiences of youth then we must ask the youth about those experiences.

The second key part of the rights perspective is the right of youth to determine what is important. For example, the Child Behavior Checklist was designed to assess behaviors that adults found problematic (Achenbach & Rescorla, 2001). This is an important concept to measure as being able to coexist with adults is certainly a part of being in society. Therefore parents' perceptions about youth behavior can and should be assessed, but it is likely that youth and parents value different things. The other scales and measures that are used are also generally measures of concepts that adults identify as inhibiting preparation for adulthood, or well-becoming. For example, depression is a problem because it leads to adverse long-term outcomes, rather than depression being a problem because it is a miserable experience for the depressed youth. The subjective well-being perspective requires that we ask youth what is important to them and assess those topics as well. I think this is the next step in understanding the ill-being and well-being of this population of youth.

Interviewing youth can be more difficult than interviewing adults because of their less-developed introspection. Additionally, synthesizing the perspectives of different segments of the child welfare-involved population may prove challenging or impossible. While there may be overlap in what a 10 year old child of Hispanic migrant parents living in a rural area and a 16 year old

living in New York City define as well-being, these perspectives may drastically diverge.

Additionally, interviewing child welfare-involved youth may be challenging because of the legal complications of who the legal guardian is for some of the youth and consequently multiple adults (e.g. judge and birth parent) may need to sign a consent form. However, logistic challenges and possible conceptual issues should not pre-emptively inhibit the attempt.

## **5.7 Summary**

The conclusions we can draw from these results on ill-being are that social skills, behavior and mental health should be assessed separately for older youth starting around 11 years old. For younger youth, a more general measure that touches on all of the domains could be used to assess for ill-being given the inter-related nature of the domains. However, for both age-groups, and probably even for younger children, assessments should include a youth report and/or the report of an objective observer. Including a second opinion, rather than relying on parents to report on the youth's emotions and behaviors would provide a more accurate picture of the youth.

These findings extend the research on the discrepancy between youth and parent reports to a new population that has heretofore had limited discussion of this situation. Given the potential unreliability of the report of child welfare-involved parents, consistently including a youth report is pragmatic. Including a youth report is also in line with the international movement toward children's rights.

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# Appendix A: All Preliminary Models 8-10 year olds

Model	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
Model 1: Mental health, social skills and behavior on one latent factor	599.98 (65)	0.85	0.82	0.117 (.109-.126)	0.083
<b>Two Domains</b>					
Model 2: Mental health and social	318.57 (35)	0.85	0.81	0.116 (.105-.128)	0.096
Model 3: Mental health and social, youth latent factor	120.11 (32)	0.95	0.94	0.068 (.055-.081)	0.045
Model 4: Mental health and social, caretaker and youth latent factors	73.92 (27)	0.98	0.96	0.054 (.039-.069)	0.035
Model 5: Mental health and Behavior	291.18 (26)	0.89	0.85	0.131 (.117-.144)	0.045
Model 6: Mental health and behavior, youth latent factor	No parameter estimates				
Model 7: Social and behavior	70.89 (14)	0.97	0.95	.083 (.064-.102)	.043
Model 8: Social and Behavior, caretaker latent factor	17.70 (9) p=.04	0.99	0.99	0.040 (.009-.068)	0.027
<b>Single Domain</b>					
<b>Mental Health</b>					
Model 9: Mental Health without attention	104.61 (9)	0.90	0.84	.133 (.111-.157)	.085
Model 10: Mental health with attention	159.72 (14)	.90	.85	.132 (.114-.151)	
Model 11: Mental health with attention and covarying errors	72.02 (13)	0.96	0.93	.087 (.068-.011)	.028
Model 12: Mental health, no attention, covarying errors for yth respondent	11.35 (8)*	1.00	0.99	.026 (.000 - .059)	.012
Model 13: Mental health, latent construct for caretaker, no covarying errors for yth	9.66 (5)*	1.00	0.99	.040 (.000-.077)	.012
<b>Social: Model 15</b>					
Model 16: Social, covarying errors, caretaker	599.98 (65)	0.85	0.82	.117 (.109-.126)	.083
Model 17: Social, caretaker latent factor	1.21 (1)*	0.99	0.99	.019 (.000-.112)	.010
<b>Behavior</b>					
Model 18: Behavior with attention	No convergence				
Model 19: Behavior, attention and rule-breaking constrained to equal loadings	NA – no fit stats				
	7.98 (1)	0.99	0.97	.108 (.048-.183)	.052

^ fit index within accepted range

\*P=NS at .05

# Appendix B: All Preliminary Models 11-17 year olds

Model	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
Single factor					

Model 39: Mental health, social skills and behavior on one latent construct	6975.52 (230)	0.45	0.40	.167 (.164-.170)	0.161
Two Domains					
Mental Health and Social					
Model 41: Mental health and social	3353.08 (104)	0.52	0.45	.170 (.168-.178)	0.155
Model 42: Mental health and social, with care latent factor	951.41 (99)	0.88	0.85	.091 (.085-.096)	0.080
Mental Health and Behavior					
Model 43: Mental health and Behavior	4617.23 (119)	0.50	0.43	.19 (.185-.194)	0.171
Model 44: Mental health and behavior, only yth for behavior	2459.32 (77)	0.64	0.57	.172 (.166-.178)	0.132
Model 45: Mental health and behavior, only caretaker for behavior	3171.70 (77)	0.53	0.45	.196 (.190-.201)	0.179
Model 46: Mental health and behavior, caretaker latent factor	1644.82 (112)	0.83	0.79	.114 (.109-.119)	0.062
Model 47: Mental health and behavior, youth latent factor	1622.12 (109)	0.83	0.79	.115 (.110-.120)	0.059
Social and Behavior					
Model 48: Social and behavior	2057.76 (44)	0.58	0.47	.209 (.201-.217)	0.138
Model 49: Social and Behavior, caretaker latent factor	734.48 (39)	0.86	0.80	.130(.122-.139)	0.069
Model 50: Social and behavior, only caretaker for behavior	268.02 (20)	0.91	0.87	.109 (.097-.120)	0.042
Model 51: Social and behavior, only yth for behavior	543.63 (20)	0.76	0.67	.158 (.147-.170)	
Single Domain					
Mental Health					
Model 52: Mental Health without attention	1805.02 (44)	0.61	0.51	.195 (.188-.203)	0.155
Model 53: Mental health with attention	2669.48 (65)	0.57	0.49	.195 (.189-.202)	0.164
Model 54: Mental health, no attn, yth latent factor	240.43 (.37)	0.96	0.93	.072 (.064-.081)	0.029
Model 55: Mental health, no attention, care latent	244.39 (39)	0.96	0.94	.071 (.062-.079)	0.031
Social					
Model 56: Social	364.63 (9)	0.45	0.09	.194 (.177-.211)	0.070
Model 57: Social without deviant peer scale	309.28 (5)	0.52	0.04	.24 (.218-.264)	0.079
Model 58: Social, no deviant peer, covarying youth report	13.61 (4)	0.99	0.96	.048 (.022-.077)	0.030
Model 59: Social, latent construct for caretaker	Model not identified				
Model 60: Social, no deviant, no teacher, covarying youth report	5.67 (1) p=.02	0.99	0.95	.067 (.022-.124)	0.012
Behavior					
Model 61: Behavior with attention	1053.21 (9)	0.56	0.26	.333 (.316-.350)	0.143
Model 62: Behavior without attention	446.78 (2)	0.60	-0.20	.46 (.425-.497)	0.113
Model 63: Behavior, yth latent	161.90 (6)	0.93	0.82	.157 (.137-.148)	0.038
Model 64: Behavior, only caretaker report	Just identified				
Model 65: Behavior, only caretaker report, attention and rule-breaking set to equal	3.48 (1) NS	0.99	0.99	.049 (.000-.110)	0.025
Model 66: Behavior, only yth report	Just identified				
Model 67: Behavior, only yth report, attention and rule-breaking set to equal	3.60 (1) NS	0.99	0.99	.050 (.000-.109)	0.026
Model 68: Behavior, yth and caretaker latent	166.04 (3)	0.93	0.65	.228 (.199-.258)	0.047
Factors (warning, parameters unreliable)					

# Appendix C: Post-hoc Testing Only 14-17 year olds

<b>Appendix Leek:</b>	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
<b>Caretaker only in behavior<sup>A</sup></b>					
Model 85: Three-factor, yth latent, aggressive WITH rule-breaking	628.45 (122)	0.90	0.87	.086 (.079-.093)	0.050
Model 86: Higher order with care latent	632.71 (123)	0.90	0.87	.086 (.079-.092)	0.076
<b>Youth only in Behavior<sup>A</sup></b>					
Model 87: Three-factor, caretaker latent factor rule- breaking WITH substance abuse	1001.18 (122)	0.81	0.77	.113 (.107-.120)	0.154
Model 88: Higher order, caretaker latent	665.39 (126)	0.89	0.86	.087 (.081-.094)	0.050

<sup>A</sup>Deviant peer and teacher SSRS report removed

# Appendix D: Post-hoc Testing only Youth Reports

<b>Appendix Tomato:</b>	Chi-square (DF)	CFI	TLI	RMSEA	SRMR
Model 89:Three-factor, only youth report, 14-17 yo	325.14 (41)	0.89	0.85	.111 (.100-.122)	0.057
Model 90:Three-factor, only youth report, 11-17 yo	656.33 (41)	0.87	0.83	.119 (.112-.128)	0.061
Model 91:Higher order, only youth report, 14-17 yo	325.14 (41)	0.89	0.85	.111 (.100-.122)	0.057
Model 92:Higher order, only youth report, 11-17 yo	656.33 (41)	0.87	0.83	.119 (.112-.128)	0.061

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