

Assessing the Structure of Moral Intuitions in Early Adolescence

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Abstract

This dissertation sought to test the psychometric validity of assessing adolescent moral intuitions using the Character Foundations Survey (CFS). The CFS was developed using a theoretical structure based on moral foundations theory (MFT), and previous research validated its use in assessing adult populations. Results presented here suggest the CFS was able to only partially capture the structure of moral intuitions in early adolescents. MFT factors of animal physical, autonomy, and loyalty retained their structure while ratings of other items seemed to be more influenced by affective factors rather than the categorical domain distinctions that characterized the structure of adult moral intuitions. A new instrument was developed based on these three factors, the 3-Factor Character Foundations Survey (CFS-3). A multi-group confirmatory factor analysis was used to search for latent factor mean differences between several age and sex groups using the CFS-3. Results indicated that 11-12-year-old females had higher factor means in all three latent factors when compared to 11-12-year-old males. Eleven-12-year-old males showed no difference in latent factor means when compared to 13-14-year-old males. However, the latent factor mean of the loyalty factor of 13-14-year-old females was significantly less than the latent factor mean of 11-12-year-old females—resulting in no difference in latent factor mean between 13-14-year-old females and 13-14-year-old males in that factor. Thirteen-14-year-old females retained higher latent factor means in the animal physical and autonomy factors when compared to 13-14-year-old males. An attempt is made to explain these results based on theory from adolescent moral development research, and possible future directions are discussed.

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CHAPTER 1: INTRODUCTION

In 2005, the *Journal of Research on Adolescence* published a special issue on adolescent moral development. In the first line of that issue contributing editors wrote, “Moral development in adolescence has reached maturity as an area of research” (Hart & Carlo, 2005). However, the most prominent moral psychologists of the past fifty years (e.g., Bloom, Greene, Skitka, Haidt, and Turiel) were completely absent from that issue’s reference list. This anecdote is in no way meant to slight the journal or its editors (as the manuscripts contained in that special issue are highly relevant and well done studies) rather it is mentioned here to highlight how isolated the field of adolescent moral development has been from the broader field of moral psychology—and, in turn, to bring attention to how difficult it is to connect broader theory in moral psychology with current theory in adolescent development. As such, the few research studies that have tried to apply adult-derived models of moral theory to adolescent contexts have done so with weak theoretical backing and improperly validated instruments.

The field of adolescent moral development could benefit from research findings in contemporary moral psychology, and vice versa. For example, contemporary moral psychology has provided useful explanations for many of the most pressing social, cultural, and political phenomena of modern times (Haidt, 2012; Pinker, 2018), but this work has been largely ignored in adolescent moral development research. Also, current theory in moral psychology draws heavily from anthropology and evolutionary biology (Henrich, 2016; Richerson & Boyd, 2008). This has allowed for more rigorous studies, more generalizable findings, and more bold predictions but, despite this attempt to find firmer footing in evolutionary biology, moral psychology research still relies extensively on assumptions about human development rather than on developmental theory. For example, leading theory in moral psychology asserts that even

pre-verbal infants have innate moral intuitions regarding justice, care, and reciprocity, and it is implied that these innate intuitions carry through to adulthood—maintaining form through childhood and adolescence (Bloom, 2013; Haidt, 2001). However, there is reason to believe that moral development is much more complex than that, especially during adolescence.

In an attempt to form linkages between research in adolescent development and contemporary moral psychology, the literature review for this dissertation focused on research within and adjacent to two prominent theoretical frameworks: (1) the moral foundations theory (MFT) of Jonathan Haidt and (2) the social domain theory (SDT) of Elliot Turiel. An attempt was then made to rectify what was seen as an overextension of the assumptions of MFT and provide an entry point for contemporary theory in moral psychology to inform research in adolescent moral development. The measure used in this dissertation assessed adolescents' moral intuitions using a series of moral violation vignettes derived from MFT and validated for use in adult populations. The data were analyzed using factor analysis methods to test if the latent factor structure of moral intuitions in an adolescent sample was consistent with the well-established structure in adults. Where the adult model succeeds and where it fails to adequately capture the structure of adolescent moral intuitions will provide important guidance for forming more useful models of human moral development.

The long-term goal of my research agenda is to better use theory to guide social, emotional, and character development (SECD) research that subsequently guides formal and informal educational initiatives. Applications can include things like (1) creating more culturally responsive SECD standards (e.g., do state sponsored standards respect the cultural diversity and values of *all* stakeholders?), (2) creating SECD curricula that respect the appropriate developmental stage of the student and optimize the use of critical periods of development, (3)

designing better curricula for traditional academic subjects (e.g., how might moral concerns such as respect for authority or in-group loyalty create obstacles for science education?), and (4) designing better interventions for both SECD and traditional academic subjects (e.g., at what point do students give up when trying to solve a problem, and can moral valence or other affective stimuli be used to motivate them to persevere?). These examples of future directions will benefit from a more accurate understanding of how theory in contemporary moral psychology maps onto adolescent development.

CHAPTER 2: LITERATURE REVIEW

This literature review seeks to accomplish three main goals: (1) accurately portray theory behind moral foundations theory (MFT), (2) highlight a few key assumptions and limitations of that theory, and (3) review literature from adolescent moral development as it relates to MFT in an attempt to fill gaps in both fields. Accomplishing these three goals will set the stage for the measure used in this thesis and allow for discussion of the outcomes of using that measure to assess adolescent moral intuitions.

To accomplish the goals listed above, this literature review starts by defining morality through the lens of MFT research. A brief description of learning theory relevant to moral intuition development is also provided followed by the specifics of MFT and its limitations. Then, a brief history of moral development research is provided and pertinent studies from the field of adolescent moral development are discussed insofar as they relate to the MFT paradigm. Finally, measures used to assess MFT are reviewed and the research questions of this thesis are established.

Defining Morality

The history of morality scholarship extends back to the earliest recorded texts in history. Morality has been *the* primary concern of philosophy, scripture, law, and political discourse for thousands of years. Yet, in everyday contexts morality remains an ambiguous concept. It is usually recognized as a set of personal and social standards for right and wrong behavior. In moral psychology research, the first distinction to be made is between normative and descriptive accounts. *Normative* accounts of morality seek to define what *is* right and wrong. *Descriptive* accounts merely attempt to describe what societies, groups, and individuals consider right and wrong. However, from the view of MFT, morality takes on a more precise definition based on

social function. In this view, morality is a complex function of evolved psychological mechanisms and their cognitive, conceptual, and cultural correlates that increase cooperation and group fitness, i.e., the ability for extended members of a family, clan, tribe, or society to function better (reproductively fitter) than another family, clan, tribe, or society (Curry, 2016; Curry, Mullins, & Whitehouse, 2019; Henrich & Henrich, 2006). Common components of these mechanisms include empathy, the basic emotions (e.g., fear), the moral emotions (e.g., guilt), cultural norms and taboos, and reward and punishment (e.g., punitive deterrents, positive and negative reinforcement). However, the functional fitness gained from such mechanisms refers to incremental gains throughout evolutionary history and does not necessarily have anything to say about how beneficial these evolved psychological and cultural mechanisms are in the contexts of modern day societies (Gross, 1998; Tooby & Cosmides, 1990). Nonetheless, in this thesis, the word “moral” and its derivatives will be used only in the descriptive sense, will recognize possible evolutionary origins, and will imply the intersecting functionality of social, cultural, and psychological mechanisms to support complex group function.

Theory Behind Moral Foundations Theory (MFT)

MFT posits that genetic and cultural mechanisms provide a foundation for developing moral constructs based on consistent social challenges throughout our evolutionary past. Thus, MFT argues that the moral domain is built on the “foundations” of innate psychological biases that direct the development of moral constructs. Culture, in turn, uses these foundations to build further fitness enhancing constructs and social institutions—often in a reciprocal fashion akin to gene-culture coevolution (discussed further in the next section) (Henrich, 2016; Richerson & Boyd, 2008).

In MFT, the word *innate* means “organized in advance of experience” (Graham et al., 2012; Mitchell, 2020), but it does not mean “hardwired” or uninfluenced by environmental factors. Rather, MFT recognizes that genes can organize neural systems in ways that have significant influence in directing developmental processes (for an intro to the genetic basis of innate neural systems, see Barabási and Barabási (2020) and Mitchell (2020)). Genes, innate neural systems, and biological ontogeny then interact with environmental experiences to instantiate recurrent constructs. Therefore, MFT sees morality as innate *and* highly dependent on environmental influence. An illustrative example comes from the classic study by Cook and Mineka (1989) in which young rhesus monkeys that had shown no prior fear of snakes were shown videos of adult monkeys reacting fearfully to snakes. After a single exposure, the young monkeys expressed a fear of plastic snakes. A separate group was shown adult monkeys reacting fearfully to flowers. Subsequently, this other group showed no fear of flowers. Thus, according to MFT, evolution has organized innate neural mechanisms in rhesus monkeys to learn a fear of snakes, but this ability is not a general-purpose learning mechanism that would allow them to learn all the fears of adult role models equally. The same innate bias was demonstrated in humans by DeLoache and LoBue (2009).

Another clear example of how MFT would describe the ability of innate systems to direct learning and conceptual content is through innate mechanisms for motivational valuation. For example, humans are born with a preference (value) for sweetness and place high value on eating sweet things while at the same time avoiding bitter things. In the same way that the tongue and brain interact to yield pleasure when sweetness is tasted, there are cognitive modules that, for example, yield pleasure when fair exchanges occur or cheaters are punished (Graham et al., 2012). It has been demonstrated experimentally that chimpanzees and six-year-old children will

incur a cost (in physical effort and monetary units) to observe moral violators punished (Mendes, Steinbeis, Bueno-Guerra, Call, & Singer, 2018). Thus, MFT is based on the idea that the human mind is organized in advance of experience in a way that prepares it to learn values, norms, and behaviors based on a set of recurrent social problems that arose consistently during our evolutionary history (Graham et al., 2012), e.g., preferring ripe fruit and cooperating with others.

Learning Theory Relevant to Moral Intuitions: Gene-Culture Coevolution Theory

The dynamic interaction of genes, culture, and learning is often referred to as gene-culture coevolution. Gene-culture coevolution posits that as humans began to rely on the transmission of cultural knowledge for survival, cultural learning became a factor that interacts with genes to guide evolutionary outcomes. As an illustrative example, ancient tribes living in the arctic relied on complex strategies for obtaining food and shelter. The loss of even a small amount of that knowledge could have been deadly, so the ability for an individual to learn (and for the group to teach) the necessary knowledge and skills was a selective pressure that influenced our ancestors' genes and traits related to learning, teaching, and cooperation. The degree to which the social challenges facing humans and early human-like species were consistent between time and place was the degree to which evolution could select for psychological traits that helped solve those challenges.

Researchers have a fairly good estimate of when higher-level cultural learning gained traction as a selective pressure. Paleontologists have found right-handed cutting and carving tools from about two million years ago (Toth, 1985). Handedness is a result of specialized functions for the left and right halves of the brain (brain lateralization), and brain lateralization is evidence of abstract language abilities—the foundation of cultural transmission (Bradshaw & Nettleton, 1982; Henrich, 2016; Renfrew, Frith, Malafouris, & Frey Scott, 2008). Thus, theory

states that for about two million years, maybe more, gene-culture coevolution has influenced many of our learning biases. For a more in-depth look at gene-culture coevolution see Richerson and Boyd (2008) and Henrich (2016).

Moral Foundations Theory

MFT is a pluralist (i.e., morality is not one thing but many things) approach to defining and delineating the moral domain (Shweder & Haidt, 1993). The theory is built on “foundations” of moral concern based on specific criteria (Haidt, 2012). The original theory posited five moral foundations, and researchers regularly propose additional foundations in response to new anthropological, evolutionary, and psychological data.

Criteria for Selecting Moral Foundations

MFT researchers have put forward five specific criteria to aid in defining these elemental foundations of the moral domain: (1) a common concern in third-party normative judgments, (2) automatic affective evaluations, (3) widespread cultural distribution, (4) evidence of innate preparedness, and (5) an evolutionary model demonstrates an adaptive advantage. For more elaboration on the development of these criteria, see Graham et al. (2011) and Graham et al. (2012).

The Moral Foundations

From the criteria mentioned above, MFT researchers proposed five foundations of morality: (1) care, (2) justice, (3) loyalty, (4) authority, and (5) sanctity. Recently, a sixth foundation, autonomy, has found empirical support and offers many promising avenues for research in adolescent development. A summary of each foundation along with the adaptive challenge it might have evolved to solve, original triggers, contemporary triggers, characteristic emotions, and relevant virtues is provided in Table 1.

Table 1*Moral Foundations Table Modified from Haidt (2012)*

	Care	Justice	Loyalty	Authority	Sanctity	Autonomy
Adaptive challenge	Protect and care for others, especially offspring	Benefit from two-way relationships without being taken advantage of	Form groups that accomplish more than the sum of the individuals	Cultivate beneficial relationships within hierarchal social structures	Avoid pathogens	Provide avenues for innovation and new ideas
Original triggers	Suffering or distress of one's child	Cheating, cooperation, freeloading	Threat or challenge to group	Signs of dominance and submission	Human waste, diseased people	Submission, subjugation
Current triggers	Baby kittens, cute cartoons	Wall Street Protests	Sports fandom, nationalism	Bosses, respected professionals	Taboo ideas, sexual impurity	Forced marriage
Emotions	CARE, Compassion	RAGE, anger, gratitude, guilt	Group pride, anger against traitors	FEAR	Disgust	SEEKING
Relevant virtues	Caring, kindness	Fairness, justice, trustworthiness	Loyalty, patriotism, self-sacrifice	Obedience, deference	Temperance, chastity, piety, cleanliness	Independence, personal responsibility

Limitations of MFT

MFT often equates rapid, intuitive moral judgments with innateness. In other words, because moral judgments can happen fast, reflexively, and without higher level thought processes, they must be the result of an innate mechanism. This equation disregards examples of how learning and habituation can produce rapid, intuitive responses in a wide range of seemingly arbitrary social and cognitive tasks (Bonzanni, Rouleau, Levin, & Kaplan, 2019; Ha, Cashon, Holt, & Mervis, 2020; Uribe-Bahamonde, Becerra, Ponce, & Vogel, 2019). Innateness is further inferred through observations of seemingly moral behaviors in other animals and pre-verbal infants, but the seeming similarities in phenomena cannot be used to conclude that the same mechanisms are instantiating such phenomena. Rather, it would be advisable to use more

parsimonious learning and developmental theories to explain these phenomena until innate systems can be proven or disproven through more rigorous genetic and neuroimaging evidence.

A way forward for MFT is to use the work of Jaak Panksepp and his study of affective systems as a guide. Panksepp proposed rigorous, falsifiable hypotheses for specific neural systems involved in discrete emotional responses in humans and other mammals (Panksepp, 2005). To support claims of innateness, MFT will need to propose and test for specific, innate neural systems and explain how those systems evolved as a result of moral phenomena. Even if the endeavor of finding such systems falls short, MFT could still benefit from a more precise understanding of the role that well-established innate affective systems play in moral judgment. That more precise mapping could bolster MFT claims of complex “collections” of innate systems that are used in consistent ways to guide moral development. While any claims about such specific systems are beyond the scope of this thesis, developmental research is well poised to contribute to testing theories of these systems based on what is already well established with regard to neural and affective development during adolescence (Immordino-Yang & Gotlieb, 2017; Peters, 2016).

Finally, more recent research projects have correlated functional brain networks (e.g., default, salience, and executive networks) with moral phenomena (Eres, Louis, & Molenberghs, 2018; Han, 2017; Han, Chen, Jeong, & Glover, 2016; Han, Glover, & Jeong, 2014; Sevinc & Spreng, 2014). However, they too will fall short of supporting claims of innateness of specifically moral systems if they cannot demonstrate how the evolutionary development of these systems (or subsystems thereof) are the direct consequence of moral phenomena. To accomplish that, there would first need to be more rigorous criteria applied to defining what

constitutes the moral domain in these neuroimaging studies (a challenge MFT has attempted to overcome) and associated moral phenomena will need to be studied in developmental contexts.

A Brief History of Moral Development Research Outside of MFT

In 1958, Lawrence Kohlberg published his dissertation titled *The development of modes of moral thinking and choice in the years 10 to 16*. The research in that dissertation contained in-depth interviews and qualitative analysis of children's and adolescents' moral judgments (Kohlberg, 1958; Turiel, 2008). Through that dissertation and the decades of research that followed, Kohlberg created and refined a 6-stage theory of moral development (Kohlberg, 1978; Kohlberg & Hersh, 1977): (1) obedience and punishment, (2) individualism and exchange, (3) interpersonal relationships, (4) authority and social order, (5) social contract, and (6) universal principles. These six stages have been the focus of a considerable amount of moral development research over the past seventy years.

Early on, one of Kohlberg's stated aims was to understand the relation of moral thought with moral emotion (Kohlberg, 1963/2008). In this regard, Kohlberg was well ahead of his time, as he recognized that emotions are not always in opposition to rational thought. Rather, emotional appraisals are part and parcel of reasoning, and emotions are an effective means to take into account the reactions of self and others in moral contexts (Kohlberg, 1963/2008). In this way, Kohlberg understood that moral development was intrinsically linked to social/emotional development during adolescence (Kohlberg, 1963/2008; Turiel, 2008).

In the 1970s, in response to perceived limitations in Kohlberg's methods, a new instrument designed to assess moral development was created by James Rest (Rest, 1974). The Defining Issues Test (DIT) was a self-report measure of moral development that presented participants with a series of hypothetical moral dilemmas. After each dilemma, the participants

were given three choices for how the protagonist *should* act. Next, the participants rated the degree to which certain issues related to the dilemma influenced their decision. Finally, they ranked four items in terms of which one best reflected their thought process while arriving at their decisions. This information was then used to assign a developmental stage. The DIT found widespread use in the 1980s and 1990s, and correlations were found in expected places, e.g., philosophy graduate students scored higher than students in other disciplines and developmental stage positively correlated with moral comprehension, pro-social behaviors, and professional decision-making (Duckett et al., 1997; Ziegenfuss, 1999).

By the end of the 1990s, the scenarios of the DIT were deemed to be outdated and a new instrument, the DIT-2, was created (Rest & Narvaez, 1999). The DIT-2 also used newly available statistical analysis methods, and it was found that, psychometrically, there was little difference between stages 2 and 3 and stages 5 and 6. This led the creators of the DIT-2 to propose an updated model that consisted of three levels instead of six. This departure from the six-stage model became known as the Neo-Kohlbergian model and placed more emphasis on an automatic process of “schemas.” The Neo-Kohlbergian model also accepted that individuals might retain their abilities for reasoning at lower levels, and that the stage-wise progression was more gradual than discrete (i.e., on a continuum).

In the 1980s and 1990s, one of Kohlberg’s students, Carol Gilligan, began looking more closely at the differences between the ways males and females *approach* moral dilemmas rather than the decision-based outcomes themselves (Gilligan & Attanucci, 1988; Murphy & Gilligan, 1980). She originally posited that females *approach* morality from an orientation of concern for care and harm (i.e., an ethic of care) whereas males *approach* morality from the orientation of concern for justice (i.e., an ethic of justice). While these sex differences in moral orientation

found mixed results, researchers in the field started looking more closely at the possibility of different types of moral orientation.

Research by Smetana (1995) demonstrated that when asked to self-generate moral dilemmas females tended to focus on personal moral conflicts (i.e., involving personal relationships). Males, on the other hand, were more likely to focus on impersonal content (i.e., persons, groups, or institutions that are highly generalized and not known personally). It has been argued by Smetana that these differences in “content-focus” could go a long way in explaining how female orientations are often seen as reflecting a concern for “care” while male orientations are often seen as reflecting a concern for “justice.” Regardless of the actual cause, by researchers’ own admissions, the care vs. justice orientation as a parsimonious explanation of sex differences in moral judgment has not found reliable empirical support (Smetana, 1995; Walker, 2014; Walker, de Vries, & Trevethan, 1987). However, understanding these “content focus” differences could be important when creating instruments designed to assess moral intuitions during adolescence.

Social Domain Theory

Social domain theory (SDT) arose as the result of one of Kohlberg’s students, Elliot Turiel, observing that even preschool age children seem to be able to distinguish moral from non-moral social norms. Turiel articulated the bases of SDT as follows: “moral, conventional, and personal domains constitute separate developmental pathways and that, therefore, before adequate analyses of developmental progressions can be made, it is necessary to delineate the features of each type of thought, what distinguishes the domains, and how they are applied in situational contexts” (Nucci & Turiel, 2009). In other words, social domain theory focused on the knowledge-based distinctions that were made between three conceptual domains: (1)

morality (e.g., issues of justice, rights, and welfare), (2) social conventions or agreed-upon uniformities in social behavior determined by the social and cultural system in which they are formed (e.g., wearing clothes in public), and (3) matters of personal concern (i.e., personal behaviors and beliefs that do not have broad reaching social or moral impact) (Nucci & Turiel, 1993).

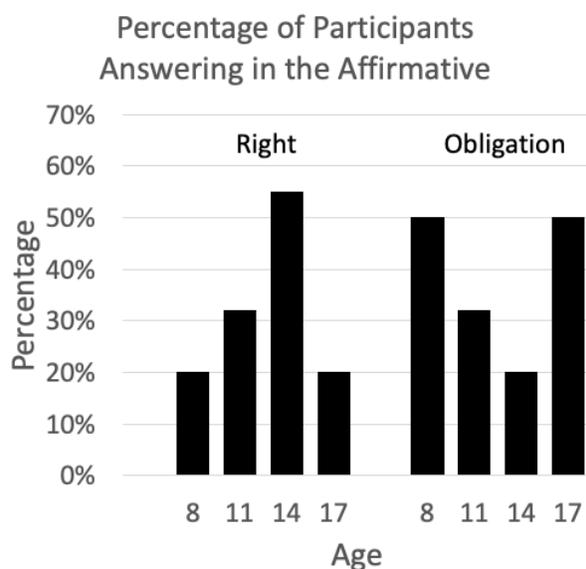
Research in Social Domain Theory

Studies from SDT have provided insights into complex patterns of moral development during adolescence. These studies have given special attention to age, sex, and environmental influence. For example, some early research in social domain theory looked at age, sex, and school environment interactions using Kohlberg's moral judgment and moral knowledge assessments. The results offer evidence of a slightly faster rate of moral development for girls at the younger ages (10-13) and slightly slower rate of moral development for girls at the older ages (16+) (Turiel, 1976).

A more recent study in SDT asked children and adolescents ages 8 to 17 years old to judge a hypothetical situation in which another student needs \$10 to participate in an activity with friends. While on the bus, the student sees someone drop a \$10 bill. Participants were asked to judge if, upon seeing the bill dropped, the student would have the *right* to pick up the bill and keep it. They were also asked if the student would have an *obligation* to pick up the bill and return it. Results showed that participants ages 8 and 17 years old answered similarly in stating that someone would not have a right to pick up and keep the bill and they would have an obligation to pick up and return the bill. However, at 14-years-old, a high percentage of participants stated that the person would have a right to keep the bill and that they would have no obligation to return it (Figure 1) (Nucci & Turiel, 2009).

Figure 1

Approximate Results from Nucci & Turiel (2009)



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Another part of this study used a scenario of a student hitting another student. For this scenario, researchers created three test conditions: (1) unconflicted (i.e., the protagonist hit another student because he or she was in a bad mood), (2) conflicted with self-interest (i.e., hitting in response to being hit first), and (3) conflicted with other-interest (i.e., hitting in response to a student hitting another student). In these “direct-harm” situations, virtually all respondents across all ages indicated that the protagonist in the unconflicted situation would be wrong to engage in hitting. However, results from the two conflicted conditions were mixed. About half of all students in each age group argued that it would be acceptable to hit in response to being hit. Early adolescents (10-14 years old) had a higher rate in claiming this “right” than did 8- and 16-year-old participants (Nucci & Turiel, 2009). However, if the child doing the initial hitting was described as emotionally vulnerable, more than 90% of participants in all age groups judged that it would be wrong to hit this child in response to being hit and instead should flee the

situation or seek help. Fewer children in all ages endorsed hitting in the interceding role (i.e., hitting in response to seeing another kid being hit).

These two studies highlight a couple important things about adolescent moral development. First, there is an interesting pattern of responses correlated with age in the “indirect harm,” rights/obligations scenarios, with 8- and 17-year-old participants giving responses at similar rates, but 14-year-old participants indicating that the student had a right to keep the money and no obligation to return the money at much higher rates. However, results are mixed and less clear for the direct harm, physical hitting scenarios. This suggests that beyond the moral/conventional distinctions, there are more nuanced distinctions being made in the moral domain, as not all responses to moral violations follow similar patterns. The causes of these more nuanced distinctions (e.g., affective biases or knowledge-based, categorical distinctions) are unclear.

In research meant to further explore the role of environmental factors in the construction of moral/conventional distinctions, a study of religiously raised adolescents found no age difference in the basic distinctions between moral and nonmoral religious rules, but there were age differences in the justifications provided for criterion judgments (i.e., the criteria used to arrive at those distinctions). For example, in criterion judgments of moral issues, there was an age-related decrease in the proportion of “alterability justifications” that referred to God’s law and an increase in the use of intrinsic feature justifications, e.g., it caused harm. For non-moral issues, there was an increased tendency with age to employ a social system rather than God’s law justifications for alterability and generalizability judgments (Nucci, 1982). This suggests that youth continue to develop their knowledge of the features of moral violations and increasingly use those intrinsic features to make moral judgments during adolescence.

Adolescent Research Adjacent to Factors Proposed by MFT

Several domains of adolescent development research have inadvertently coalesced around key factors proposed by MFT. These domains included empathy, authority, autonomy, loyalty, and betrayal. The common thread running through all these lines of research is that adolescence is a developmental period especially primed for connecting affective states to appropriate social-emotional constructs that in turn guide behavioral outcomes, including moral intuitions and moral decision making.

Empathy Development in Adolescence

Research in the area of empathy scale development has suggested a two factor model that separates cognitive empathy from affective empathy (Jolliffe & Farrington, 2006). Cognitive empathy is defined as the ability to comprehend the emotions of another. Affective empathy is the capacity to experience the emotions of another. In general, females score higher in both affective and cognitive empathy. In the validation study of the Basic Empathy Scale (BES), both types of empathy were positively correlated with intelligence for females. For adolescent males, empathy was positively correlated with “conscientiousness.” For both females and males, cognitive empathy was positively correlated with “extraversion,” and affective empathy was positively correlated with “neuroticism.” For both females and males, both types of empathy were positively correlated with “agreeableness” and “openness” (Jolliffe & Farrington, 2006).

More nuanced neuroimaging research has divided empathy into three core components: (1) emotion recognition, (2) perspective taking, and (3) affective responsiveness (Derntl et al., 2010). Analysis of behavioral tasks related to these three components showed no significant gender differences. However, analysis of neuroimaging data revealed distinct functional brain networks for males and females. Females showed stronger neural activation in all three empathy

related tasks in emotion-related areas, e.g., amygdala, and these activations were mediated by hormone changes during the estrus cycle (Derntl et al., 2010).

Comprehensive reviews of empathy development from infancy to adulthood suggest that empathy development is rooted in infancy—with even higher-order components of empathy such as perspective-taking and emotional regulation evidenced in pre-verbal infants (Tousignant, Eugène, & Jackson, 2017). In this view of empathy development, adolescence is a critical period of refining “top-down” emotional control mechanisms in order to foster more appropriate empathic responses in increasingly complex social situations (Tousignant et al., 2017). This process requires the associations of abstract concepts, values, and norms with affective and behavioral responses—a developmental process for which adolescence seems to be biologically primed (Blakemore & Mills, 2014; Fuhrmann, Knoll, & Blakemore, 2015).

Empathy development in adolescence has been associated with prosocial moral reasoning (Eisenberg-Berg & Mussen, 1978), and maternal child-rearing practices have been shown to be a predictor of empathy development (Soenens, Duriez, Vansteenkiste, & Goossens, 2007). In one study, mothers of highly empathic boys tended to be nonpunitive, nonrestrictive, egalitarian, encouraged their sons to discuss their problems, and set high standards (Eisenberg-Berg & Mussen, 1978). In the same study, daughters’ empathy was not associated with parental practices, but it was hypothesized that this might have been due to a ceiling effect (Eisenberg-Berg & Mussen, 1978).

Authority as a Factor Guiding Moral Development During Adolescence

Most research on authority in adolescent development has been concerned with the authority-based *relationships* between parents and their children rather than the more general affective/intuitive associations related to mental representations of authority when judging third-

party moral violations. These studies on authority-based relationships have shown that authority mediated outcomes are linked to context (Smetana, 1995). Studies have consistently shown little variation from ages 5-18 with regard to children's and adolescents' judgments of adults' legitimate authority to make moral rules; however, at the same time, children and adolescents readily deny an adult's authority when the adult's request is considered immoral, e.g., when an adult tells a child to hit or steal (Damon, 1977; Smetana, 1995; Turiel, 1976). Interestingly, judgments of legitimacy are often a function of social position (e.g., teachers vs. former teachers), knowledge (competent vs. incompetent teachers), and adult status (e.g., peer vs. adult). Social position and knowledge have both been shown to be more important in determining the legitimacy of authority (compared to merely status as an adult), and awareness of competence and knowledge as criteria for judging legitimacy increases in middle childhood (Kim & Turiel, 1996; Smetana, 1995). These influences of authority and "prestige" point back toward learning biases proposed by gene-culture coevolution.

Autonomy as a Central Factor of Adolescent Development

The development of autonomy has been described as one of the most important tasks of adolescence (Smetana, 2017; Zimmer-Gembeck, Collins, & Adams, 2003). While definitions of autonomy in adolescent research vary, two primary domains of autonomy development have been proposed: (1) autonomy-as-independence (i.e., the degree to which adolescents are self-reliant and make decisions on their own) and (2) autonomy-as-volition (i.e., the degree to which adolescents regulate their behavior based on their own values, preferences, and interests as opposed to external control) (Soenens, Vansteenkiste, Van Petegem, Beyers, & Ryan, 2017). Increased autonomy-as-independence tends to yield mixed results in terms of predicting well-being or delinquency during adolescence. This is likely because a high-degree of premature

autonomy-as-independence leaves adolescents open to costly failures, whereas appropriate, sequential, and well-guided autonomy-as-independence is a sign of positive role model involvement in the adolescent's life and a minimizing of risks. On the other hand, increased autonomy-as-volition consistently predicts better personal and social adjustment, indicating that when the intrinsic motivations for increased autonomy in adolescence coincide with appropriate opportunities to construct cogent schemas for values, preferences, and interests, adolescent autonomy is positively correlated with prosocial outcomes (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009). The research in adolescent autonomy development under these domains has been mostly concerned with normative accounts in single-culture contexts and descriptive accounts in multi-cultural contexts—often using culture and socioeconomic status as predictors of adolescents' beliefs about what decisions they should have the right to make and when (Smetana, 2017).

Another account of adolescent autonomy development seeks to define autonomy development as “governance transfer” (Tilton-Weaver & Marshall, 2017). Governance transfer is seen as a transactional process by which control is transferred from parents to adolescents as adolescents increasingly understand societal constraints and are ready to regulate themselves in accordance with societal expectations. Interestingly, researchers have modeled this process based on SDT and have used the degree of harm caused by violations as a guiding principal. In their model, “harm to self” is considered a “prudential” domain that includes physical and emotional harm (Tilton-Weaver & Marshall, 2017). “Harm to other” is divided into the “conventional,” which includes low-harm emotional violations, and the “moral,” which includes high-harm physical and emotional violations. A fourth domain, “personal” includes choices that have no harmful consequences for the self or others. However, in “autonomy as governance transfer”

theory, it is unclear why such domains are considered adequate to capture the entirety of adolescence autonomy development, and it is even less clear why the conventional/moral domains are separated merely by degree of harm or why the conventional domain only includes emotional harm.

Adolescents' Sense of Loyalty

Surprisingly little research has been done on adolescents' sense of loyalty, and even less has been done related to loyalty development. Most mentions of loyalty are embedded in research on adolescent peer relationships. For example, loyalty arises as a concept adolescents are concerned with when tasked with forming exclusive peer groups (Leets & Sunwolf, 2005). However, violations of the expectations of loyalty (i.e., betrayal) have amassed a large body of research.

Betrayal is typically studied in the contexts of highly traumatic experiences (e.g., abuse by a caregiver or a cheating romantic partner) (Atlas & Ingram, 1998; Burton, Halpern-Felsher, Rankin, Rehm, & Humphreys, 2011; Feldman & Cauffman, 1999; Gobin & Freyd, 2009), so little is known about the effects of more benign forms of betrayal during development. What is clear is that feelings of loyalty and betrayal are highly salient features of group dynamics, especially in small-group interactions (Moreland & McMinn, 1999). There is also reason to believe that adolescence is a period especially sensitive to the affective responses associated with betrayal (e.g., anger, shame) (Keng, Noorahman, Drabu, & Chu, 2019). Betrayal research seems to be focused predominantly on young girls' experiences of betrayal, and there is evidence to suggest that experiences of betrayal are much more salient and the effects of betrayal are much more harmful for girls (Keng et al., 2019; Singer & Doornenbal, 2006).

Adolescent Research Under the MFT Paradigm

Research in child and adolescent development under the paradigm of MFT is extremely limited, and no research to date assesses the validity of using the foundations of MFT in developmental studies. Rather, in these studies, the structure of moral intuitions in adolescence is assumed to be the same as adults.

One study in this area looked at a sample of Mongolian youth and correlated ratings on moral foundations with life aspirations (Bespalov, Prudnikova, Nyamdorj, & Vlasov, 2017). Results indicated that binding foundations (authority and sanctity) were negatively correlated with intrinsic aspirations (e.g., personal development), but loyalty correlated positively with extrinsic aspirations (e.g., high salary). Also, intrinsic aspirations were supported by a more typically liberal (as defined by MFT) moral attitude evidenced by increased importance given to the individualizing foundations (care and justice).

Some cross-cultural research has looked at the role of moral salience and its mediating effects in the context of decision making in video games (M age=13.11, SD =.52 and M age=12.84, SD =.56, for German and U.S. youth, respectively) (Joeckel, Bowman, & Dogruel, 2012). This research found that moral salience (as measured under the paradigm of MFT) led to decreased probability of committing moral violations in the video game, while decreased salience led to an observed random distribution of moral violations. Follow-up research from that study showed differences between German and U.S. youth in the effect of moral salience. For German youth, moral salience showed a decrease in decisions to commit moral violations, while U.S. youth's decisions to commit moral violations appeared to be random (Joeckel, Bowman, & Dogruel, 2013). Besides these select studies, the closest the rest of MFT research comes to investigating adolescents is within populations of 18- to 22-year-old college students.

Assessing the Moral Foundations

Several instruments have been created for assessing MFT in adult populations, but the validity of using such instruments to assess children's and adolescents' moral intuitions is unsubstantiated. No prior research has validated the use of the following MFT assessments to assess moral intuitions in children or adolescents.

MFT has been primarily assessed via the Moral Foundations Questionnaire (MFQ) (Graham et al., 2011). In the MFQ, participants self-report the degree to which a concern is relevant in making a moral decision. An example of an item designed to assess for the care foundation asks the participant to rate the degree to which "someone suffers emotionally" influences their moral decision making. Based on the relative degree to which participants self-report being influenced by concerns from each foundation, a moral foundations profile for that individual or group can be created. Interesting correlations have been found with these profiles. For example, political liberals rate the care and justice foundations as highly relevant to their moral decision-making while ranking the loyalty, authority, and sanctity foundations relatively low. On the other hand, political conservatives give relatively equal weight to all five of the original foundations when making moral judgments (Graham, Haidt, & Nosek, 2009).

Numerous other instruments have been created to assess MFT. For example, The Moral Foundations Sacredness Scale uses reports of how much money one would have to be paid to violate the foundations in various ways (Graham & Haidt, 2012). Another instrument uses an "implicit measures" assessment which includes an evaluative priming instrument in which foundation-related vice words are presented as 150 ms primes before positive or negative affective targets (Graham, 2010). The Foundation Tradeoff Task pits foundation violations against one another in a "which is worse?" assessment (Graham, 2010). A series of sentences

describing actions that either support or violate the foundations has been used to measure micro-expressions in facial muscles (Cannon, Schnall, & White, 2011). Another instrument used in neuroimaging methods has sentences with a target word indicating support or rejection of a moral opinion related to a specific foundation (Graham, 2010; Van Berkum, Holleman, Nieuwland, Otten, & Murre, 2009). For use in text analysis, a moral foundations dictionary has been created that categorizes morally valenced words based on the foundations (Graham et al., 2009). Recently, a standardized database of moral violation vignettes for use in neuroimaging studies was created and validated by Clifford, Iyengar, Cabeza, and Sinnott-Armstrong (2015). Vignettes from this standardized database were used to construct the instrument used in this thesis.

Empirical Hypotheses

While the nature of this study is exploratory, there are several research questions with related hypotheses that can be made. First, the relative absence of research on MFT with an adolescent sample raises questions of the psychometric validity of using adult measures to assess adolescents. Thus, it makes sense to first test if the adult structure holds in adolescence, as is assumed by current MFT research in the field. If all or part of the structure of moral intuitions in early adolescence can be established, the starting and ending points of adult consistent moral intuitions will be known, and, from there, more rigorous developmental hypotheses can be tested.

From the perspective of comparing and contrasting SDT with MFT, SDT best represents a theory of the *features associated with concepts of moral violations* (e.g., generalizable wrongness and intrinsic harmfulness) whereas MFT is best thought of as a theory of *individual differences in the kinds of acts categorized as moral violations* (Landy, 2016). If SDT is

embedded in MFT to explain the conceptual knowledge and domain distinctions that develop and are prioritized differently at different ages, it can be hypothesized that in addition to unique latent factor structures during development, there will be patterns in moral/conventional distinctions during development as well. This could result in adolescents at different stages of development making different categorical distinctions and prioritizing different salient features of violations in those categories while processing morally relevant scenarios. It is hypothesized that this would result in different latent factor means between different age and sex groups.

CHAPTER 3: METHODS

Measures

This thesis uses three measures: (1) an instrument consisting of 48 items from the standardized database of moral violation vignettes by Clifford et al. (2015), (2) a modified version of this 48 item instrument named The Character Foundations Survey (CFS) used to assess adolescents, and (3) a pared-down version of the CFS named The 3-Factor Character Foundations Survey (CFS-3) consisting of 13 items from three factors of the original 8-factor instrument.

Creation of Original Validated Moral Violation Vignettes Database

To establish a validated database of moral violation vignettes for use in neuroimaging studies, Clifford et al. (2015) created a large set of text-based moral violation scenarios based on MFT. In their validation studies, they had adult respondents rate the moral wrongness of these scenarios, indicate *why* the scenarios they were rating were morally wrong, and rate the scenarios for imageability, vividness, arousal, frequency, and comprehension. Through several rounds of this, researchers arrived at selection of moral violation vignettes that they thought best capture the MFT paradigm and respective factors. These vignettes were further validated by factor analysis methods and correlating results with existing measures of MFT (the MFQ and MFSS).

The Character Foundations Survey (CFS)

The Character Foundations Survey (CFS) draws from the larger standardized database of vignettes created and validated for use in neuroimaging studies of adult populations by Clifford et al. (2015). In creating the CFS, some of these vignettes were modified to make them appropriate for use with children and adolescents. Of the 48 moral violation vignettes taken from Clifford et al. (2015), 31 were used exactly as is with no modification from the originals.

Thirteen vignettes were slightly modified to make them easier for youth to understand, e.g., changing the word “chuckling” to “laughing” and the word “professor” to “teacher.” Four vignettes were heavily modified to make them appropriate for youth, e.g., removing explicit sexual references. As in the Clifford et al. (2015) study, the autonomy foundation was included and the care foundation was split into physical harm to animals, physical harm to humans, and emotional harm to humans. Thus, 48 vignettes in eight categories were used. The eight factors will be referred to as animal physical, human physical, human emotional, justice, autonomy, authority, loyalty, and sanctity. For the sake of validation, a series of six unmodified norm violation vignettes was also taken from the Clifford et al. (2015) study. These norm violations were scenarios in which the behavior was odd or abnormal but not likely to be interpreted as a *moral* violation.

The CFS was completed by students at school through Qualtrics, an online survey platform. The vignettes were presented in six blocks with each block containing nine randomly ordered vignettes (the order of which randomly changed for each participant). Instructions for each block read “Rate the following situations.” Each vignette started with “You see a/an/someone...” Under each vignette was a five-point Likert scale consisting of the choices 1=“*not bad*”, 2=“*a little bad*”, 3=“*bad*”, 4=“*very bad*”, and 5=“*extremely bad*.” After completing all blocks of vignettes, participants were asked a series of demographic questions including grade, age, sex, gender identity, political ideology, political party, who they would have voted for in the last presidential election, if either of their parents went to college, if either of their parents were or had ever been in the military, their social status amongst peers, their peer group identity, and how they viewed the social groups at the school. Two attention checks asked participants to simply choose a specific rating for that item (e.g., “For this item, select “a little

bad”). Examples of vignettes from each factor are shown in Table 2. A complete list of items and demographic questions can be found in Appendix A. Survey screenshots are provided in Appendix B, and a complete list of original vignettes and respective modified vignettes is provided in Appendix C.

Table 2

Examples of Moral Violation Vignettes Used in CFS

<u>Factor</u>	<u>Example</u>
Animal Physical	You see a boy throwing rocks at a cow in a field.
Human Physical	You see a boy placing a thumbtack sticking up on the chair of another student.
Human Emotional	You see a girl saying that another girl is not pretty enough to be a varsity cheerleader.
Justice	You see a runner taking a shortcut on the course during the marathon in order to win.
Autonomy	You see a mother telling her son that she is going to choose all of his friends.
Authority	You see a star player ignoring her coach's order to come to the bench during a game.
Loyalty	You see a teacher publicly saying she hopes another school wins the math contest.
Sanctity	You see a woman not wash her hands after using a public toilet.
<i>Norm</i>	<i>You see a woman using a fork to eat a bowl of vanilla ice cream and marshmallows.</i>

The 3-Factor Character Foundations Survey (CFS-3)

Based on results from the CFA of the 8-factor model and a subsequent EFA, the 3-Factor Character Foundations Survey was created (CFS-3). The CFS-3 incorporated items from the animal physical, autonomy, and loyalty foundations of MFT. The factors and associated items are shown in Table 3.

Demographics

Three datasets were used in this thesis: (1) the adult dataset from the original Clifford et al. (2015) study (n=416), (2) an adolescent dataset collected for this study consisting of data from participants who completed the entire CFS, all demographic questions, and answered correctly two attention checks (n=822), and (3) an adolescent dataset consisting of data from

participants who completed the 48 items of the CFS, passed both attention checks, and answered the age and sex demographic questions (n=850).

Table 3

Factors and Items of the CFS-3

Item ID	Factors and Items
	Animal Physical
Q1_8	You see a man beating his pony with a whip for getting loose from its pen.
Q2_2	You see a woman throwing her cat across the room for scratching the furniture.
Q3_2	You see someone leaving his dog outside in the rain after it dug in the trash.
Q4_2	You see a boy throwing rocks at cows in a field.
Q5_2	You see a zoo trainer jabbing a dolphin to get it to entertain his customers.
	Autonomy
Q2_4	You see a mother telling her son that she is going to choose all of his friends.
Q3_4	You see a man forbidding his wife to wear clothing that he has not first approved.
Q4_4	You see a woman pressuring her daughter to become a famous evening news reporter.
Q6_4	You see a mother forcing her daughter to enroll as a medical student in college.
	Loyalty
Q1_6	You see a coach celebrating with the other team's players who just won the game.
Q2_6	You see a former US General saying publicly he would never buy any American product.
Q3_6	You see a mayor saying that the neighboring town is a much better town.
Q4_6	You see a teacher publicly saying she hopes another school wins the math contest.

Adult Baseline Study Participants

Participants for the adult baseline study were recruited in three waves ($n = 330, 192, 94$) by Clifford et al. (2015) using an online survey panel provider (Qualtrics). Respondents were limited in age from 18-40 years old, with a mean of 34 years old. Balanced numbers of liberals, moderates, and conservatives were recruited. A dataset containing $n=416$ participants from this study was obtained from Clifford et al. (2015) and used for conducting the Adult Baseline Study.

Adolescent Participant Recruitment and Data Collection

Participants were recruited by emailing invitations to all middle and high school principals who had an email address listed in the Kansas State Department of Education (KSDE) database (openly available via the KSDE Data Central online portal) as of fall 2018 and fall

2019. The invitation to participate was presented as part of a research project to influence the state standards for social, emotional, and character development. For participation, schools were offered aggregated analysis of the results and the possibility for future collaboration and professional development. A unique protocol with detailed and specific instructions was developed to allow the survey to be administered in school by teachers during school hours. Extra care was taken to ensure students were aware that the survey was voluntary and that no identifiable information would be collected. The protocol for this study was approved by the University of Kansas's Institutional Review Board as STUDY00142366: "Character Foundations Survey (CFS) Reliability and Validation Study." Parents were notified at least two weeks prior to administration of the survey with instructions for how to opt-out their child. Study approval and protocol documents can be found in Appendix D.

Invitations were distributed twice. For the initial distribution in the fall of 2018, email invitations were sent to over 700 school principals. A specific number is not provided here because it is uncertain how many emails in the database were active and how many sent emails were blocked by spam filters. From the initial distribution, 29 responded with an interest in the study and six eventually had students at their school participate before the end of the school year. The second round was distributed in the fall of 2019. For this second round, again over 700 school principals were sent email invitations but this time 12 responded with interest. A deadline for participation was set for December 2019. An additional five schools had students participate in the survey prior to this deadline. From both rounds, public and private middle and high schools participated. In the end, 3,022 students logged on to participate in the survey. Of those, 1,730 completed both attention checks and completed enough of the survey to provide usable data (58% completion rate).

Adolescent Study Participants

Adolescent participant results used in this thesis came from three medium-sized, suburban middle schools in Kansas, U.S.A. These schools were likely more cosmopolitan than schools in surrounding counties due to relatively large military populations. Thus, the participant racial demographics closely equated to national averages from the 2010 census. One of the schools was located on a military base; one of the schools served a large military population as a result of a military base in the same town; and one of the schools served residents in a Wichita suburb in relatively close proximity to a military base. Additional school demographics are provided in Table 4.

Table 4

Demographics of Middle Schools Providing Participant Data

School	Demographics		
	Approx. Enrollment	Approx. Race	Subsidized Lunch
1	850	White 70% Black 5% Hispanic 20%	50%
2	750	White 55% Black 15% Hispanic 10%	60%
3	600	White 50% Black 15% Hispanic 20%	40%

A total of 1,373 students from these schools logged on to the survey website (62% of total enrollment). Of students who logged on, 59% completed the entire survey and answered two attention checks correctly ($n = 822$). There were no significant differences in completion rates between schools. Respondents had an average reported age of 12.37 years (Table 5).

Table 5*Student Age Frequencies*

Age	Frequency
11	179
12	268
13	270
14	105
Total	822

More girls ($n = 460$) than boys ($n = 362$) completed the entire survey. For the subsequent EFA and the CFA of the CFS-3, a slightly larger sample was used ($n = 850$), and these participants were divided into age and sex based groups (Table 6). This sample was composed of all students who completed all moral violation items, passed both attention checks, and answered the age and sex demographic questions (but possibly no other demographic questions). The addition of these students was distributed relatively equally between age and sex groups and made no significant changes to completion rates or average age.

Table 6*Age and Sex Group Frequencies*

Age and Sex	Frequency
11-12 male	203
13-14 male	172
11-12 female	259
13-14 female	216
Total	850

Plan of Analysis

A combination of methods from classical test theory and factor analysis were used to analyze the data. Theoretical models were tested using CFA and novel models were explored through exploratory factor analysis (EFA). An overview of these factor analysis methods is provided here along with specifics for how they were carried out in this thesis.

Confirmatory Factor Analysis (CFA), General Overview

Since its inception in the early 1900s, factor analysis has become one of the most widely used multivariate statistical procedures in psychology (Brown, 2015; Spearman, 1904). The method is primarily concerned with determining the number and nature of latent variables (factors) that account for variation and covariation among a set of observed measures (indicators) (Brown, 2015). In other words, a latent factor is an unobserved variable that influences a set of observed measures and accounts for correlations among observed measures. Often, the interpretation is that the observed measures are intercorrelated because they share a common cause (i.e., influenced by the same underlying construct). To accomplish this, factor analysis partitions the variance of each indicator (derived from the sample correlation/covariance matrix which is used as input for the analysis) into two parts: (1) common variance, which is the variance accounted for by the factor, estimated on the basis of variance shared with other indicators in the analysis; and (2) unique variance, which is a combination of (a.) reliable variance specific to the indicator (i.e., systematic influence on only one indicator) and (b.) random error variance (i.e., measurement error or unreliability in the indicator) (Brown, 2015).

Factor analysis comes in two main types: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The fundamental difference is that EFA is a data driven approach that makes no a priori specifications about the number of factors or their relationship, whereas in CFA, the researcher specifies the number of factors and pattern of indicator-factor loadings (as well as other parameters) to test a hypothesized number of factors and their relationships. In CFA, the prespecified factor solution is evaluated on how well it reproduces the sample correlation (covariance) matrix (Brown, 2015).

CFA models are composed of factor loadings, unique variances, and factor variances. Factor loadings are the regression slopes for predicting the indicators from the latent variable. In unstandardized solutions, factor variances express the sample variability (dispersion) of the factor (i.e., the extent to which the sample's degree of the latent dimension is similar or different). Also, CFA models may include error covariances if they are substantively justifiable (e.g., two indicator prompts are unique in their use of the word "American" and thus share a characteristic that gives them a meaningful covariance not shared by the other indicators).

Analysis Methods

All classical test theory analyses were carried out using IBM's statistical package SPSS version 25. The initial CFAs of the 8-factor models were carried out using R version 3.5.1 (2018-07-02). Subsequent EFA and CFA analyses were conducted after a later version of R had been released, R version 3.5.3 (2019-03-11) -- "Great Truth". Both were conducted on the x86_64-apple-darwin15.6.0 (64-bit) platform on an early-2013 model MacBook Pro computer.

A CFA was conducted on the original data set from the Clifford et al. (2015) study using the corresponding 48 vignettes that compose the CFS. Model fit was compared using the fit indices reported in the original study published in *Behavioral Research Methods*, Dec. 2015, 47(4): 1176-1198. These include chi-squared test statistics, root mean error of approximation (RMSEA), and Akaike information criterion. For all studies in this thesis, a p -value less than .05 was considered significant and a p -value greater than .05 but less than .10 was considered approaching significant if there was converging evidence to suggest results were significant.

CHAPTER 4: RESULTS

Adult Baseline Study CFA

Raw data was obtained from the researchers in the Clifford et al. (2015) study and reanalyzed using the corresponding 48 items of the CFS. As expected, results are almost identical to the full 90-item set of vignettes reported in their study ($\chi^2(1052) = 1965.87$; RMSEA = .048, $p = .992$) (Table 7).

Table 7

CFA Fit Statistics of 48-item CFS, Adult

Factors	Model Description	χ^2	df	χ^2/df	RMSEA	90% C.I.	AIC
8	Division of animal physical, human physical, and human emotional	1965.87	1052	1.86	.048	.058, .061	129,997

Factor loadings and factor covariances were also consistent with the original findings of Clifford et al. (2015). A complete table of factor loadings for each item is available in Appendix E, and the covariances between latent factors are provided in Table 8.

Table 8

Adult Factor Covariances, 48-item Subset, Clifford et al. (2015) Data

	Animal Physical	Human Physical	Human Emotional	Justice	Autonomy	Authority	Loyalty
Animal Physical	1						
Human Physical	0.696	1					
Human Emotional	0.623	0.782	1				
Justice	0.537	0.677	0.704	1			
Autonomy	0.594	0.663	0.691	0.547	1		
Authority	0.367	0.621	0.785	0.701	0.632	1	
Loyalty	0.365	0.497	0.712	0.627	0.567	0.837	1
Sanctity	0.495	0.639	0.762	0.718	0.547	0.815	0.766

All p-values < .001

Covariances greater than .8 in bold.

Adolescent Descriptives and Classical Test Theory Analysis

Adolescent results ($n=822$) of the CFS were analyzed via several methods from classical test theory to better understanding the data and participants' ratings of scenarios. A paired-samples t-test was conducted to compare the means of the moral violation ratings to the mean of the norm violation ratings. There was a significant difference in the average moral violation rating ($M=3.60$, $SD=.547$, $SE=.019$) and average norm violation rating ($M = 1.411$, $SD = 0.587$, $SE = 0.020$); $t(821) = 114.853$, $p < .001$) (Table 9).

Table 9

Item Means by Factor

Factor	Statistics		
	Mean	Std. Error	Std. Deviation
Animal Physical	4.171	0.024	0.695
Human Physical	4.011	0.024	0.693
Human Emotional	3.854	0.024	0.681
Justice	3.690	0.023	0.658
Autonomy	3.562	0.027	0.766
Authority	3.410	0.025	0.720
Loyalty	2.915	0.027	0.769
Sanctity	3.205	0.025	0.705
Norm	1.411	0.020	0.587

Item-total correlation is a measure of the correlation of an item with the total of the other items in the group of items under the same factor. A small item-total correlation would indicate that an item is not measuring the same construct as assessed by the other items. All items showed sufficiently strong item-total correlations within their respective factors (Table 10).

A reliability analysis was run and almost all sets of items for each factor showed acceptable tau-equivalent reliability, but human emotional showed high reliability ($\alpha = 0.803$) and sanctity showed a questionable reliability ($\alpha = .609$) (Table 11).

Table 10*Item Total Correlations, Entire CFS Instrument, Adolescent Data*

Item	Factor	ITC	Item	Factor	ITC
Q1_2	Animal Physical	0.591	Q1_4	Autonomy	0.626
Q1_8	Animal Physical	0.684	Q2_4	Autonomy	0.660
Q2_2	Animal Physical	0.718	Q3_4	Autonomy	0.671
Q3_2	Animal Physical	0.674	Q4_4	Autonomy	0.697
Q4_2	Animal Physical	0.697	Q5_4	Autonomy	0.554
Q5_2	Animal Physical	0.692	Q6_4	Autonomy	0.713
Q2_8	Human Physical	0.655	Q1_5	Authority	0.647
Q3_8	Human Physical	0.652	Q2_5	Authority	0.654
Q4_8	Human Physical	0.728	Q3_5	Authority	0.704
Q5_9	Human Physical	0.682	Q4_5	Authority	0.743
Q6_2	Human Physical	0.661	Q5_6	Authority	0.730
Q6_9	Human Physical	0.690	Q6_5	Authority	0.700
Q1_1	Human Emotional	0.550	Q1_6	Loyalty	0.571
Q2_1	Human Emotional	0.755	Q2_6	Loyalty	0.655
Q3_1	Human Emotional	0.755	Q3_6	Loyalty	0.679
Q4_1	Human Emotional	0.722	Q4_6	Loyalty	0.751
Q5_1	Human Emotional	0.694	Q5_7	Loyalty	0.668
Q6_1	Human Emotional	0.774	Q6_7	Loyalty	0.609
Q1_3	Justice	0.624	Q1_7	Sanctity	0.479
Q2_3	Justice	0.730	Q2_7	Sanctity	0.565
Q3_3	Justice	0.689	Q3_7	Sanctity	0.570
Q4_3	Justice	0.646	Q4_7	Sanctity	0.569
Q5_3	Justice	0.660	Q5_8	Sanctity	0.637
Q6_3	Justice	0.598	Q6_8	Sanctity	0.682

All correlations at $p < .001$ **Table 11***Cronbach's Alpha Reliability for Each Factor*

Factor	Cronbach's Alpha
Animal Physical	0.758
Human Physical	0.753
Human Emotional	0.803
Justice	0.737
Autonomy	0.728
Authority	0.788
Loyalty	0.730
Sanctity	0.609

Factor Analyses, Adolescent Data

Factor analyses were conducted on the adolescent data in several steps. First, each individual factor was assessed as a single factor model to test fit and search for points of strain in the models caused by unaccounted for error covariances. Next a series of models based on previous research in MFT were assessed using CFA. High latent factor covariances suggested that the 8-factor model lacked parsimony, so an EFA was conducted. Based on results from the EFA, a new 3-factor model was created using a subset of items from the CFS. This 3-factor model was then assessed using CFA, and a multi-group CFA was used to assess factor mean differences between several age- and sex-based groups.

Single Factor Error Covariances of 8-Factor Model

When assessing each individual factor, residual covariances (error covariances) between items were found indicating that these items were more related than was predicted by not correlating their errors (residuals). Modification indices provided via the lavaan package in R corroborated this pattern, further suggesting that additional relationships between items within each factor needed to be accounted for. The significance of the increase in fit was tested using the test of -2Δ in log-likelihood difference testing ($-2\Delta LL$) (Appendix F) and interpretations of these error covariances are provided in the discussion section.

For human physical harm, items Q2_8 and Q3_8 had a significant and interpretable error covariance. These items were the only two that involved an adult physically harming a child—all the others involved children harming other children. The human emotional factor had a significant error covariance between items Q1_1 and Q5_1. These were the only two items that involved a scenario in which a person was being laughed at for something beyond their control (i.e., a disability and a disease). The justice vignettes showed a significant error covariance

between items Q4_3 and Q6_3. These were the only two vignettes that involved a clear power imbalance between the offender and the people suffering the offence, i.e., a referee vs. a team and a teacher vs. a student. Autonomy violations had a significant error covariance between items Q4_4 and Q6_4. These are the only two items that involved a mother oppressing her daughter. For the authority foundation, the two items with a significant error covariance were Q1_5 and Q2_5. These were the only two items that explicitly mention the subject (protagonist) of the scenario as a girl in the beginning of the sentence. Two other authority violations included female protagonists, but the protagonists in these sentences are introduced as a “student” and a “star player.” Only later in the sentence were their genders indicated through the use of the pronoun “her.” On the other hand, the two items with significant error covariance introduced the protagonist immediately as “a girl” and “a teenage girl” (Q1_5 and Q2_5, respectively).

Null-model Testing, CFS, Adolescent Data

Prior to testing several theoretical nested-models, a baseline null-model analysis in which all factor means were held at zero was conducted to test for reliability of comparative fit indices in the proposed 8-factor model. The RMSEA of the baseline null-model was found to be below 0.158 (RMSEA = 0.119), thus incremental comparative fit indices such as CFI and TLI were considered less informative (Kenny, Kaniskan, & McCoach, 2015). Therefore, model fit was compared via RMSEA and AIC.

Theoretical Models of MFT, Adolescent Data

Multiple theoretical models of MFT were tested sequentially so as to be able to compare such models with results from adult datasets. The 2-factor model combined all care and justice items into an “individualizing” factor. The “binding” factor is composed the loyalty, authority, and sanctity items, representing their roles in protecting individual rights and fostering group

cohesion, respectively. Subsequently, the original 6-factor model of MFT with the addition of autonomy was tested. The next model divided the care foundation into human and animal harm, and the final, eight-factor model split care into animal physical, human physical, and human emotional. As shown in Table 6, the eight-factor model that split emotional, physical, and animal harm into separate factors fit well and supported the hypothesized structure ($\chi^2(1052) = 2536.32$; RMSEA = .041); and by including the relevant, justifiable error covariances, the fit was improved further ($\chi^2(1043) = 2140.42$; RMSEA = .036, $p = 1.00$) (Table 12).

Table 12

CFA of Theoretical Models of MFT, Adolescent Data

Factors	Model Description	χ^2	df	χ^2/df	RMSEA	90% C.I.	AIC
2	Individualizing and binding	3311.56	1079	3.07	0.050	0.048, 0.052	106715.79
6	Original MFT, plus autonomy	2862.76	1065	2.69	0.045	0.043, 0.047	106225.08
7	Division of physical and emotional harm	2721.59	1059	2.57	0.044	0.042, 0.046	106074.49
7	Division of human and animal harm	2615.53	1059	2.47	0.042	0.040, 0.044	105952.86
8	Division of animal physical, human physical, and human emotional	2536.32	1052	2.41	0.041	0.040, 0.043	105874.11
8	Division of animal physical, human physical, and human emotional and inclusion of justifiable error covariances	2140.42	1043	2.05	0.036	0.034, 0.038	105439.79

When assessing the final model, the latent factor covariances from the adolescent data exhibited a fundamentally different pattern than adults, with many covariances higher than .8 (Table 13). Only animal physical, autonomy, and loyalty had no covariances between each other greater than .8.

Table 13*Latent Factor Covariance Table of 8-Factor Model, Adolescent Data*

	Animal Physical	Human Physical	Human Emotional	Justice	Autonomy	Authority	Loyalty
Animal Physical	1						
Human Physical	0.758	1					
Human Emotional	0.717	0.886	1				
Justice	0.607	0.858	0.903	1			
Autonomy	0.708	0.695	0.814	0.729	1		
Authority	0.631	0.835	0.906	0.973	0.680	1	
Loyalty	0.439	0.560	0.597	0.654	0.626	0.706	1
Sanctity	0.489	0.732	0.808	0.851	0.572	0.918	0.640

*All p-values < 0.001**Covariances greater than .8 in bold.****Adolescent Exploratory Factor Analysis***

The high covariances between several latent factors suggested that the model was not parsimoniously explaining the latent factor structure of the adolescent data. These high latent factor covariances also made it impossible to further analyze the data via multi-group CFA because the configural model returned not positive definite covariance matrices. The adult data did not exhibit these high latent factor covariances, and an EFA of the adult data suggested a model consistent with the factor structure theorized by MFT. Therefore, an EFA was conducted on the adolescent dataset to see if any of the factors loaded cleanly on items as theorized by MFT or if it exhibited a completely novel latent factor structure.

A parallel analysis to determine the number of factors to extract suggested a 6-factor model and was subsequently analyzed using Promax rotation ($\chi^2(855)=1587.73, p < .001$) (Thompson, 2004). An 8-factor EFA was also preformed based on eigenvalue decomposition that indicated eight eigenvalues greater than 1.0. The 8-factor model was also analyzed with a Promax rotation ($\chi^2(722)=1193.89, p < .001$) (Finch, 2006; Williams, Onsman, & Brown, 2010). Complete factor loadings for both 6- and 8-factor EFAs are provided in Appendix G. Consistent

with research in this area, items with unique factor loadings greater than or equal to .400 were considered sufficiently strong to be considered as items used in constructing a new model (Clifford et al., 2015; Thompson, 2004).

The 6-factor model evidenced three factors theorized by MFT as loading cleaning on items consistent with theory (Table 14). Factor 2 loaded onto five of the six animal physical items along with one human physical item. The 8-factor model was consistent with this, but Factor 2 loaded cleanly onto all six animal physical items—with the final animal physical item replacing the human physical item. The only other difference between the 6-factor and 8-factor models was that the 8-factor model included two lone items as two additional factors (one human emotional and one human physical as factors seven and eight, respectively). The 6-factor and 8-factor models both had four autonomy items loaded on by a single factor and four loyalty items loaded on by one factor. The other items were loaded in a mix-and-match fashion by two separate factors (Factor 1 and Factor 3 of the 6-factor model). The possibility that these two factors might roughly correspond to moral/conventional distinctions theorized in adolescent development and SDT along with the possibility of other conceptual and affective influences explaining these factors are considered in the discussion section. The sanctity factor loaded on two items, but these were not considered for inclusion in a new model because of the weaker performance of sanctity items in general and an under-identification issue that results from having just two items with high error correlations assessing one latent factor.

From these results, it was concluded that the CFS was not a valid tool for assessing moral intuitions in adolescence consistent with MFT, but a subset of factors was supported by converging evidence from the CFA and EFA. Therefore, a new 3-factor model was created using the five animal physical, four autonomy, and four loyalty items that had clean loadings in both

the 6-factor and 8-factor EFAs. These latent factors had relatively low covariances in the original 8-factor CFA and were consistent with factors theorized by MFT. The corresponding instrument was named the 3-Factor Character Foundations Survey (CFS-3).

Table 14

6-Factor EFA (Promax Rotation), Adolescent Data

Factor 1			
Loading	ID	MFT Fact.	Item
0.617	Q2_1	Hum. Emot.	...a girl laughing at another student forgetting her lines at a school play.
0.522	Q3_1	Hum. Emot.	...a woman commenting out loud about how bad another woman's hair looks.
0.802	Q1_3	Justice	...a student copying a classmate's answer sheet on a final exam.
0.470	Q2_3	Justice	...a runner taking a shortcut on the course during the marathon in order to win.
0.579	Q3_3	Justice	...someone cheating in a card game while playing with a group of strangers.
0.733	Q1_5	Authority	...a girl repeatedly interrupting her teacher as he explains instructions.
0.584	Q2_5	Authority	...a teenage girl coming home late and ignoring her parents' rules.
0.617	Q5_6	Authority	...a student say that her teacher is a fool during an afternoon class.
0.589	Q1_7	Sanctity	...a teenage girl at the lunch table offer to kiss anyone on the lips.
0.451	Q4_7	Sanctity	...a boy spit on the floor in the hallway.
Factor 2			
0.694	Q1_8	Anim. Phys.	...a man beating his pony with a whip for getting loose from its pen.
0.738	Q2_2	Anim. Phys.	...a woman throwing her cat across the room for scratching the furniture.
0.549	Q3_2	Anim. Phys.	...someone leaving his dog outside in the rain after it dug in the trash.
0.501	Q4_2	Anim. Phys.	...a boy throwing rocks at cows in a field.
0.565	Q5_2	Anim. Phys.	...a zoo trainer jabbing a dolphin to get it to entertain his customers.
0.433	Q3_8	Hum. Phys.	...a woman spanking her child with a spatula for getting bad grades in school.
Factor 3			
0.642	Q6_2	Hum. Phys.	...a boy placing a thumbtack sticking up on the chair of another student.
0.668	Q6_9	Hum. Phys.	...a girl whip a boy with a rope because she doesn't like him.
0.416	Q1_1	Hum. Emot.	...a teenage boy laughing at another boy with a disability.
0.448	Q4_3	Justice	...a referee intentionally making bad calls that help his favored team win.
0.683	Q6_3	Justice	...a teacher giving a bad grade to a student just because he dislikes him.
Factor 4			
0.490	Q2_4	Autonomy	...a mother telling her son that she is going to choose all of his friends.
0.497	Q3_4	Autonomy	...a man forbidding his wife to wear clothing that he has not first approved.
0.730	Q4_4	Autonomy	...a woman pressuring her daughter to become a famous evening news reporter.
0.666	Q6_4	Autonomy	...a mother forcing her daughter to enroll as a medical student in college.
Factor 5			
0.636	Q5_8	Sanctity	...a man blow his nose into his shirt.
0.634	Q6_8	Sanctity	...a woman not wash her hands after using a public toilet.
Factor 6			
0.443	Q1_6	Loyalty	...a coach celebrating with the other team's players who just won the game.
0.552	Q2_6	Loyalty	...a former US General saying publicly he would never buy any American product.
0.500	Q3_6	Loyalty	...a mayor saying that the neighboring town is a much better town.
0.432	Q4_6	Loyalty	...a teacher publicly saying she hopes another school wins the math contest.

CFA of the 3-Factor Character Foundations Survey (CFS-3), Adolescent Data

A CFA of the CFS-3 consisting of the five animal physical, four autonomy, and four loyalty items supported by the EFA was conducted. Data was used from all adolescents who completed all moral violation ratings and provided age and sex information ($n = 850$). This was done in anticipation of conducting a multi-group CFA with age- and sex-based groups. Again, a baseline null model was run to determine the relevance of comparative fit indices. For this model, the RMSEA was above .158 (RMSEA=0.195), providing evidence that comparative fit indices could be used to compare model fit (Kenny, Kaniskan, & McCoach, 2015). The CFA showed good model fit ($\chi^2(62)=153.137, p < .001$) with a robust comparative fit index (CFI) of .957 and robust RMSEA of .044 [0.035, 0.053]; $p = 0.961$ (Table 15). Complete factor loadings, intercepts, variances, and covariances can be found in Appendix H.

Table 15

Fit Statistics of CFS-3, Adolescent Data

Factors	Model Description	χ^2	df	χ^2/df	RMSEA	90% C.I.	AIC
3	Animal physical, autonomy, and loyalty factors	153.137	62	2.470	.044	.035, .053	31423.73

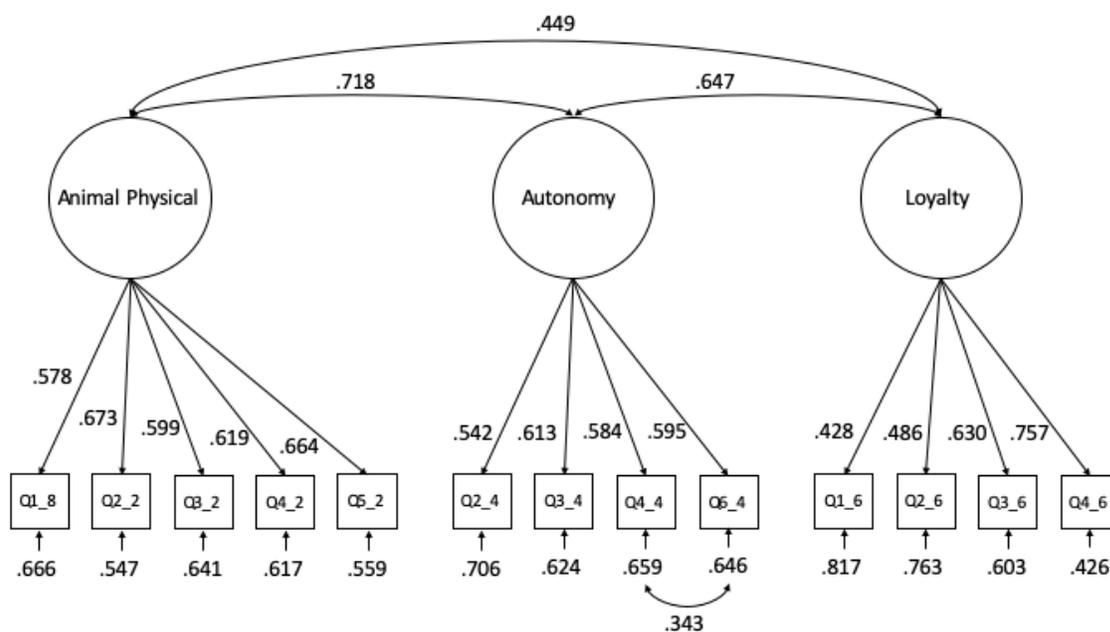
Modification indices indicated one substantial point of strain in the model between items Q4_4 and Q6_4. These were the only two items that involved an autonomy violation between a mother/daughter pair. That covariance was included in the model and fit significantly improved, so that covariance was kept in the model for subsequent analyses. The final model showed excellent fit ($\chi^2(61)=102.190$; CFI = 0.98; RMSEA = 0.028 [0.019, 0.040], $p = 1.00$) (Table 16), and all covariances between latent factors were below .800 (Table 17). A final model path diagram is provided in Figure 2.

Table 16*CFS-3 Fit Statistics with Relevant Error Covariance, Adolescent Data*

Factors	Model Description	χ^2	df	χ^2/df	RMSEA	90% C.I.	AIC
3	Animal physical, autonomy, and loyalty factors plus justifiable error covariance between items Q4_4 and Q6_4	102.190	61	1.675	.028	.019, .040	31369.059

Table 17*CFS-3 Latent Factor Covariances, Adolescent Data*

	Animal Physical	Autonomy	Loyalty
Animal Physical	1		
Autonomy	0.718	1	
Loyalty	0.449	0.647	1

*All p-values < .001**No covariances greater than .8***Figure 2***Adolescent CFS-3 Path Diagram (Standardized)*

CFS-3 Multi-Group CFA by Age and Sex

A multi-group CFA was then run by dividing adolescent participants ($n = 850$) into 4 groups: ages 11-12 male, ages 13-14 male, ages 11-12 female, and ages 13-14 female (Table 18).

Table 18

CFS-3 Multi-Group CFA Age and Sex Groups

Age and Sex Group	Frequency
11-12 male	203
13-14 male	172
11-12 female	259
13-14 female	216
Total	850

A multi-group CFA was then conducted to see if the multi-group model fit sufficiently well. The model showed good fit with a robust CFI of .955 and a robust RMSEA of .040 ($p = .968$) ($\chi^2(304) = 403.898$) (Table 19). The covariances between latent factors for each group are presented in Table 20. No meaningfully interpretable error covariances could be found from the modification indices.

Table 19

CFS-3 Multi-Group CFA Fit Statistics, Adolescent Data

Factors	Model Description	χ^2	df	χ^2/df	RMSEA	90% C.I.	AIC
3	Final 3-factor, multi-group model	403.898	304	1.329	.040	.029, .051	31326.179

Metric invariance was established through metric and scalar invariance testing. The model exhibited metric invariance which allowed for the comparison of latent factor means between groups (Table 21). Complete model fit indices can be found in Appendix I.

Table 20*CFS-3 Multi-Group Latent Factor Covariances*

Age and Sex Group	Covariances			
		Animal Physical	Autonomy	Loyalty
11-12 male	Animal Physical	1		
	Autonomy	0.638	1	
	Loyalty	0.318	0.606	1
13-14 male	Animal Physical	1		
	Autonomy	0.772	1	
	Loyalty	0.422	0.635	1
11-12 female	Animal Physical	1		
	Autonomy	0.665	1	
	Loyalty	0.531	0.715	1
13-14 female	Animal Physical	1		
	Autonomy	0.799	1	
	Loyalty	0.437	0.575	1

All p-values < 0.001

No covariances greater than .8

Table 21*CFS-3 Configural, Metric, and Scalar Model Comparisons*

Model	Statistics						
	DF	AIC	BIC	X ²	X ² Diff.	DF Diff.	p-value
Configural	244	31344	32160	325.700			
Metric	274	31324	31997	365.070	39.365	30	0.118
Scalar	304	31326	31858	427.580	62.516	30	< 0.001

Next, multi-group CFAs were conducted with a reference group's latent factor intercepts constrained to zero. Standardized latent factor intercepts of the other groups could then be interpreted as latent factor mean differences. Latent factor mean comparisons are presented in Table 22 and in graphical form in Figure 3.

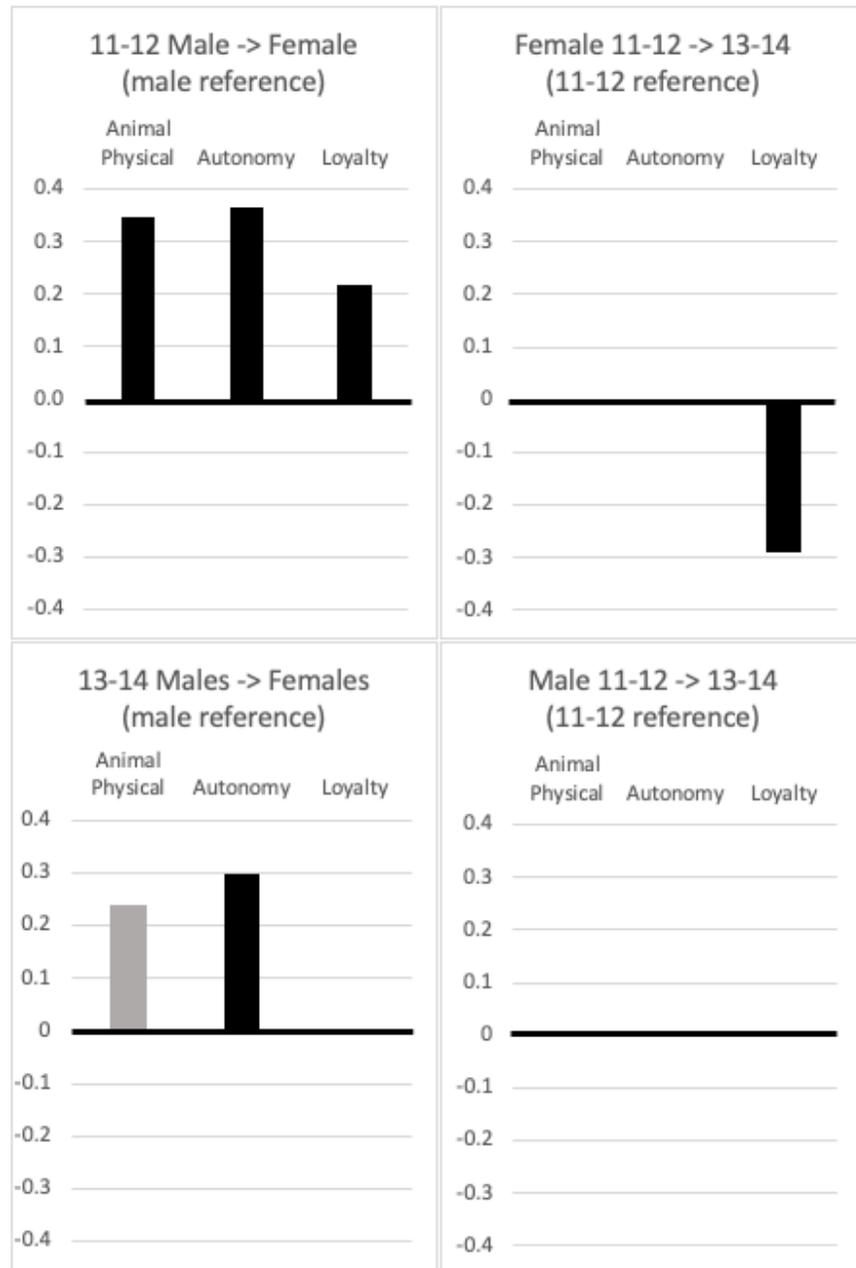
Table 22*CFS-3 Latent Factor Mean Comparisons Between Age and Sex Groups*

Reference	Comparison Groups					
	11-12 male	13-14 male		11-12 female		13-14 female
<i>Factor</i>	Std.	p	Std.	p	Std.	p
Animal Physical	-0.005	0.967	0.347	0.002	0.232	0.053
Autonomy	-0.132	0.340	0.364	0.002	0.177	0.136
Loyalty	-0.161	0.260	0.219	0.047	-0.050	0.677
11-12 female	13-14 female		13-14 male			
<i>Factor</i>	Std.	p	Std.	p		
Animal Physical	-0.128	0.236	-0.340	0.003		
Autonomy	-0.181	0.108	-0.524	0.000		
Loyalty	-0.288	0.010	-0.435	0.001		
13-14 male	13-14 female					
<i>Factor</i>	Std.	p				
Animal Physical	0.238	0.058				
Autonomy	0.298	0.017				
Loyalty	0.090	0.438				

*Significant ($p < .05$) latent factor mean differences in **bold**.*

Figure 3

CFS-3 Latent Factor Mean Comparisons Between Age and Sex Groups



Results at $p < .05$ significance level shown in black. Result approaching significant ($p = 0.058$) shown in grey. Non-significant results not shown.

CHAPTER 5: DISCUSSION

This thesis sought to assess the structure of moral intuitions in early adolescence to determine if that structure is psychometrically consistent with the structure of moral intuitions in adulthood. Converging evidence from exploratory and confirmatory factor analyses suggested that the structure of moral intuitions in adolescence was only partially consistent with the adult structure. Both MFT and SDT are inadequate to explain this unique structure in early adolescence (i.e., both the innate systems approach of MFT and the moral/conventional distinctions of SDT cannot fully explain the factor structure evidenced by these analyses). Results of these analyses are discussed in detail here and several limitations, conclusions, and future directions are suggested.

Discussion of Error Covariances from Single Factor Models

Although the 8-factor model did not hold up as a psychometrically valid model of moral intuitions for adolescents, error covariances from single factor models provided some important insights for future instrument creation—especially if those instruments are to be used to trace a path from child- to adult-consistent moral intuitions. The general theme of the error covariances was that specific types of implicit stereotypes seemed to uniquely influence specific types of moral violations (e.g., age in human physical violations, status in justice violations, kin relationship in autonomy violations, and gender in authority violations). The way in which information that could activate such stereotypes is presented also seemed influence ratings. For example, the two items exhibiting a high error covariance in the authority foundation were the only two items that explicitly mentioned the subject (protagonist) of the scenario as a female in the beginning of the sentence. Two other authority violations included female protagonists, but the protagonists in those sentences were introduced as a “student” and a “star player.” Only later

in the sentence were their genders indicated through the use of the pronoun “her.” On the other hand, the two items with significant error covariance introduced the protagonist immediately as “a girl” and “a teenage girl” (Q1_5 and Q2_5, respectively). This is consistent with neurolinguistics research that suggests gender stereotype activation occurs along a precise time course (about 475 ms from stimulus onset) and that gender stereotype priming effects are dependent on adequate time between stimuli (Arnold, Eisenband, Brown-Schmidt, & Trueswell, 2000; Cacciari, 2007; Pyykkönen, Hyönä, & van Gompel, 2009; Rakić, Steffens, & Wiese, 2018; Scarná & Ellis, 2002; Valdés-Conroy, Aguado, Fernández-Cahill, Romero-Ferreiro, & Diéguez-Risco, 2014; Vick, Seery, Blascovich, & Weisbuch, 2008; Wang, Yang, Tan, Chen, & Cantfort, 2017; Zhang, Li, Sun, & Zuo, 2018). Thus, it could be that gendered information has time to activate gender stereotypes for use in moral intuition processing when that information is provided at the beginning of the sentence, but the moral intuition processing happens so rapidly that the judgment does not have time to incorporate that information when the gender of the protagonist is presented later in the sentence. Additional studies will be needed to verify this effect.

Discussion of Adolescent 6-Factor EFA

A 6-factor EFA suggested a model with an underlying structure consistent with a subset of the factors proposed by MFT (animal physical, autonomy, and loyalty) and two unique factors (Factor 1 and Factor 3) that consisted of a mix of items from other factors proposed by MFT. A closer look at the items of these two mixed-item factors of the 6-factor model is provided here along with discussion of the three factors consistent with MFT.

Factor 1 loaded on items from human emotional, justice, authority, and sanctity. Factor 3 loaded on items from human physical, human emotional, and justice. Thus, both factors

consisted of unique items from human emotional and justice. The single human emotional item loaded on by Factor 3 was a scenario that had two key characteristics: (1) the victim is in no way culpable for the deficiency (in this case, a disability) for which he was being harmed and (2) the scenario was highly familiar and easily relatable for middle school students. On the other hand, both human emotional items loaded on by Factor 1 involved victims presumably partly responsible for the harm that befell them (i.e., forgetting lines in a play and a bad hair style). While this might seem trivial, moral judgments have been shown to be consistently influenced by intention/culpability information (Alicke, 2000; Clark, Chen, & Ditto, 2015; Cushman, 2008; Davies & Rogers, 2009).

The justice violations found in Factor 3 showed similar characteristics: (1) an unjust abuse of power that the victims were in no way responsible for and (2) victims readily relatable to middle school students (i.e., a referee making bad calls to help his favored team win and a teacher giving bad grades to a student because she doesn't like him). Conversely, the justice violations loaded on by Factor 1 did not involve an unjust abuse of power with clearly innocent, relatable victims (i.e., cheating on a test, cheating in a race, and cheating in a card game).

The two additional items loaded on by Factor 3, both human physical violations, epitomize the characteristics of harm to an innocent victim, familiarity, and ease of empathizing with the victim (i.e., a boy placing a thumbtack on another student's chair and a girl whipping a boy with a rope "because she doesn't like him"). A look at the additional violations loaded on by Factor 1 (authority and sanctity violations) showed that these items were characterized by no clear abuse of power that caused harm and no easily relatable (empathized with) victims, e.g., in item Q5_6, students might fail to empathize with the teacher who gets called a fool during class and instead side with the student.

In summary, Factor 3 seems to capture an underlying construct in early adolescence characterized by degree of harm caused to the victim and the degree to which one can readily empathize with that victim. Factor 1 seems to capture an underlying construct characterized by a more conventional, broad categorical distinction of moral wrongness when the scenario does not involve an innocent, easily relatable victim—but that broad categorical distinction lacks the nuance of adult intuitions. This suggests that adults are more readily able to use categorical distinctions when judging the moral wrongness of a situation. Thus, these results also suggest that the underlying constructs of moral vs. conventional distinctions proposed by SDT might be partly guided by affective/empathic influence in judging moral wrongness in adolescence, but, with time, the moral domain is further divided into more nuanced constructs consistent with MFT—as adults categorize types of violations into socially/culturally meaningful categories and use those categories to make personally and socially acceptable judgments (Landy, 2016).

So why do animal physical, autonomy, and loyalty factors load onto items consistent with prior theorized factors of MFT? It could be that animal physical violations are easy for early adolescents to assess due to animals' lack of culpability and the ease with which animal feelings can be anthropomorphized. Therefore, animal physical violations could bypass culpability processing. The culpability of humans is determined through complex processing often involving the consideration of many pragmatic factors including intentions and outcomes. There is neuroimaging evidence to suggest an ability to rapidly bypass certain types of intentionality/culpability processing depending on context, and this ability develops with age (Lahat, Helwig, & Zelazo, 2012).

Developmental research has long seen autonomy as a critical goal of healthy adolescent development. The way that autonomy items in this analysis exhibit psychometric validity as a

construct offers support of an autonomy bias in early adolescence. Several lines of research, including error covariances of this analysis, suggest that autonomy violations function uniquely between kin. This suggests that judgments of autonomy violations are relatively complex, involving several pragmatic, contextual, and conceptual informational inputs.

The loyalty violations themselves are relatively broad in content. The only clearly unifying characteristic is that they do indeed involve a protagonist betraying his or her in-group loyalties. The loyalty violations also have relatively low ratings in degree of wrongness. For example, on a 5-point scale, with 1 being “not bad at all” and 5 being “extremely bad,” the highest rated moral violations were the animal physical violations with a mean of 4.171 and the lowest rated moral violations were the loyalty violations with a mean of 2.915 (Table 9). So, even though the loyalty ratings were rated the least wrong, the converging evidence from the CFA and EFA suggests that there is an underlying factor influencing the ratings of the loyalty violations and that that factor is an established construct by early adolescence. Also, the loyalty factor shows different developmental patterns between males and females consistent with prior research that suggested betrayal was a more salient moral concern for females, although this seems to decrease to equality with boys by age 14. Whether or not this increases in late adolescence for males and females in a manner similar to the judgments of rights and obligations as researched by Nucci and Turiel (2009) (Figure 1) will take additional research to confirm.

Discussion of CFS-3 Multi-Group CFA, Adolescent Data

When comparing 11-12-year-old males to 11-12-year-old females, females had higher latent factor means in all three factors (animal physical, autonomy, and loyalty). There was no significant difference between 11-12-year-old males and 13-14-year-old males latent factor means for any of these factors, suggesting the lack of a developmental change in males along

these dimensions during this time. However, comparing 11-12-year-old females to 13-14-year-old females showed a significant decrease in the loyalty factor. This suggests a developmental change in females along this dimension. Consistent with this finding, when comparing 13-14-year-old males with 13-14-year-old females, females remain higher in animal physical and autonomy factors but show no significant difference in the loyalty factor. This suggests that from 11-12 to 13-14, there is a developmental shift in girls that causes a decrease in the loyalty factor so as to result in no significant difference in the loyalty factor between boys and girls at the ages 13-14.

No physiological measures of hormone levels or pubertal stage were taken so any speculation on the role such biological factors play in adolescent moral intuitions is beyond the scope of this thesis. However, several rough assumptions about developmental stages can be made for the sake of considering future directions. For example, on average, the onset of gonadarche is about age 11 for girls and about age 13 for boys. Activation of the growth hormone axis (a primary consequence of puberty) is about 12.5 for girls and about 13.8 for boys (Hansen, Bretl, & Amini, 2019). These ages align with the age groupings used in this thesis. In the future, the research paradigm presented here could be used to test hypotheses of the influence of these developmental changes on potential neural systems relevant to moral processing in these domains.

Conclusion

The structure of moral intuitions in adolescence was psychometrically different than the structure of moral intuitions in adulthood when assessed by the moral violation scenarios of the CFS. Evidence from factor analysis methods suggested several recurrent themes: (1) both MFT and SDT seem to be inadequate to explain the unique structure of moral intuitions in adolescence evidenced by the EFA and subsequent multi-group CFA (i.e., both the innate systems approach

of MFT and the moral/conventional distinctions of SDT cannot fully explain the unique ways in which adolescent moral intuitions seem to be influenced by affective, empathic information when such information is readily available yet seem to refer to broad conventional, categorical judgments when such affective information is absent). Evidence from this analysis suggests that beyond moral/conventional distinctions, adolescents continue to further refine categories of moral violations that are then used to assess morally relevant situations throughout adolescence, eventually arriving at more nuanced, adult-consistent moral intuitions that use those categorical distinctions in rating moral violations—seemingly overriding the more affective/empathic information relied upon during adolescence. (2) The structure of moral intuitions follow different developmental patterns for males and females, possibly correlating with both physiological changes and cultural influence, and (3) age, group, and gender stereotypes seem to influence certain types of moral intuitions more than others and the way in which information that might activate stereotypes is presented might have an influence on text-based assessments of moral intuitions.

These results offer several promising avenues for future research. First, the role that affect plays in adolescents' development of distinct moral categories should be looked at more closely. It seems that moral categories with high relevance to adolescent development are established by early adolescence (e.g., basic empathy, autonomy, loyalty), but how in the ensuing years the further parsing of categories of the moral domain and the means by which individuals increasingly rely on those categories in making moral judgments is unclear. Second, an understanding of the influence of implicit stereotype activations and the precise neural mechanisms and time courses of such activations will be important for developing instruments for assessing rapid, morally intuitive judgements—especially text-based instruments. Finally,

knowledge from these lines of research eventually will be applied in normative contexts, e.g., in the development of SECD standards and educational initiatives. Biological explanations for the origins of moral intuitions or innate systems used in moral processing should not be construed as blind support for using such explanations to build human social institutions. Indeed, many social institutions and moral constructs are designed precisely to oppose our more basic, evolutionarily derived drives and biases. Real progress will only be made by recognizing the complex ways in which innate propensities from biology interact with conceptual, social, and cultural factors to produce the civilized societies we rely on for our existence.

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Appendix A

Modified from Clifford, S., et al. (2015). "Moral foundations vignettes: a standardized stimulus database of scenarios based on moral foundations theory." *Behavior Research Methods* 47(4): 1178-1198.

1. You see a teenage boy laughing at another boy with a disability.
2. You see a girl laughing at another student forgetting her lines at a school play.
3. You see a woman commenting out loud about how bad another woman's hair looks.
4. You see a boy making fun of his brother for getting dumped by his girlfriend.
5. You see a man laughing as he passes a person with a disease that causes baldness.
6. You see a girl saying that another girl is not pretty enough to be a varsity cheerleader.
7. You see a woman swerving her car in order to intentionally run over a squirrel.
8. You see a woman throwing her cat across the room for scratching the furniture.
9. You see someone leaving his dog outside in the rain after it dug in the trash.
10. You see a boy throwing rocks at cows in a field.
11. You see a zoo trainer jabbing a dolphin to get it to entertain his customers.
12. You see a boy placing a thumbtack sticking up on the chair of another student.
13. You see a student copying a classmate's answer sheet on a final exam.
14. You see a runner taking a shortcut on the course during the marathon in order to win.
15. You see someone cheating in a card game while playing with a group of strangers.
16. You see a referee intentionally making bad calls that help his favored team win.
17. You see a boy skipping to the front of the line because his friend is an employee.
18. You see a teacher giving a bad grade to a student just because he dislikes him.
19. You see a boy telling his girlfriend that she must change to his religion.
20. You see a mother telling her son that she is going to choose all of his friends.
21. You see a man forbidding his wife to wear clothing that he has not first approved.
22. You see a woman pressuring her daughter to become a famous evening news reporter.
23. You see a public leader on TV trying to ban the wearing of hooded sweatshirts.
24. You see a mother forcing her daughter to enroll as a pre-med student in college.
25. You see a girl repeatedly interrupting her teacher as he explains instructions.
26. You see a teenage girl coming home late and ignoring her parents' rules.
27. You see a boy turning up the TV as his father talks about his military service.
28. You see a teaching assistant talking back to the teacher in front of the classroom.
29. You see a student say that her teacher is a fool during an afternoon class.

30. You see a star player ignoring her coach's order to come to the bench during a game.
 31. You see a coach celebrating with the other team's players who just won the game.
 32. You see a former US General saying publicly he would never buy any American product.
 33. You see a mayor saying that the neighboring town is a much better town.
 34. You see a teacher publicly saying she hopes another school wins the math contest.
 35. You see a head cheerleader booing her high school's team during a homecoming game.
 36. You see an American telling foreigners that the US is an evil force in the world.
 37. You see a man beating his pony with a whip for getting loose from its pen.
 38. You see a teacher hitting a student's hand with a ruler for falling asleep in class.
 39. You see a woman spanking her child with a spatula for getting bad grades in school.
 40. You see a girl pinch another girl so hard it leaves a bruise.
 41. You see a boy throw a rock at another boy on the playground.
 42. You see a teenage girl at the lunch table offer to kiss anyone on the lips.
 43. You see a man collecting road kill for dinner.
 44. You see a girl dating a man old enough to be her dad.
 45. You see a boy spit on the floor in the hallway.
 46. You see a man blow his nose into his shirt.
 47. You see a woman not wash her hands after using a public toilet.
 48. You see someone using an old cellphone and refusing to buy a new one.
 49. You see a woman continuing to wear a large sun hat inside her apartment complex.
 50. You see a man eating a bowl of cereal in the morning with water instead of milk.
 51. You see a woman using a fork to eat a bowl of vanilla ice cream and marshmallows.
 52. You see a man putting ketchup on his chicken salad while at lunch.
 53. You see someone driving around in a dirty car that has not been washed recently.
-
1. Age
 2. Grade
 3. Gender
 4. Are either of you parents in the military?
 - a. Yes
 - b. No
 5. Do you have an IEP for gifted education?
 - a. Yes
 - b. No
 6. I consider myself:
 - a. Not popular at all

- b. Not really popular
 - c. Popular
 - d. Very Popular
 - e. Probably the most popular person in my grade
7. How do people divide into social groups in your school? E.g., jocks, goths, nerds, etc.
- a. They don't, everyone hangs out with everyone else
 - b. there are groups, but people tend to have friends in all different groups
 - c. we have social groups and people tend to only have friends in their group
 - d. we ONLY associate with people in our groups and don't make friends with people from other groups
8. I consider myself:
- a. Democrat
 - b. Republican
 - c. Other
9. I consider myself:
- a. Liberal
 - b. Conservative
 - c. Other
10. If you could have voted in the last presidential election, whom would you have voted for?
- a. Donald Trump
 - b. Hillary Clinton
 - c. Bernie Sanders
 - d. Other
11. I am a:
- a. Nerd
 - b. Emo
 - c. Goth
 - d. Cybergoth
 - e. Memer
 - f. Gamer
 - g. Drama/Theatre Kid
 - h. Contour Queen
 - i. Hipster
 - j. Preppy
 - k. Stoner
 - l. Hippie
 - m. Religious
 - n. Environmentalist
 - o. Smart Kid
 - p. Overachiever
 - q. Bro
 - r. Feminist
 - s. Punk
 - t. Skater
 - u. Jock
 - v. Other

12. I consider myself:
- a. Christian
 - b. Muslim
 - c. Jewish
 - d. Buddhist
 - e. Hindu
 - f. Pagan
 - g. Atheist
 - h. Other
13. Did your mom go to college?
- a. Yes
 - b. No
14. Did your dad go to college?
- a. Yes
 - b. No
15. In my group of friends, I am:
- a. the leader of the group
 - b. an important member of the group
 - c. just one of the friends
 - d. the quiet one, just happy to be with my friends
 - e. a complete loner

Appendix B



This is a survey designed to allow you to express your feelings about what is right and wrong. It should take you about 5-10 minutes to finish. This survey is optional. Your name will not be attached to this survey in anyway, so no one will be able to know what you answer. The survey contains situations that you might think are wrong, but all are appropriate for someone your age. The situations might be similar to things you have experienced or seen others experience.

You can send any questions, comments, or concerns about the survey to bretl.b@ku.edu

If you have read the above paragraph and want to take the survey, click the arrow below.



Enter your school code here:

School Code





Rate the following situations:

	Not Bad	A Little Bad	Bad	Very Bad	Extremely Bad
You see a teenage girl at the lunch table offer to kiss anyone on the lips.	<input type="radio"/>				
You see a woman swerving her car in order to intentionally run over a squirrel.	<input type="radio"/>				
You see a girl repeatedly interrupting her	<input type="radio"/>				



Thank you for completing the survey!

The situations in the survey might have been similar to things you have experienced or seen others experience. If any of the questions in the survey made you feel uncomfortable, the school has trained counselors to help you. If ever you feel you want to talk to a counselor, tell a teacher you trust.

You can send any questions, comments, or concerns about the survey to bretl.b@ku.edu

Appendix C

Modified Vignettes for Use in CFS

Q1_2	Animal Physical	You see a woman swerving her car in order to intentionally run over a squirrel.
Q1_8	Animal Physical	You see a man beating his pony with a whip for getting loose from its pen.
Q2_2	Animal Physical	You see a woman throwing her cat across the room for scratching the furniture.
Q3_2	Animal Physical	You see someone leaving his dog outside in the rain after it dug in the trash.
Q4_2	Animal Physical	You see a boy throwing rocks at cows in a field.
Q5_2	Animal Physical	You see a zoo trainer jabbing a dolphin to get it to entertain his customers.
Q1_1	Human Emotional	You see a teenage boy laughing at another boy with a disability.
Q2_1	Human Emotional	You see a girl laughing at another student forgetting her lines at a school play.
Q3_1	Human Emotional	You see a woman commenting out loud about how bad another woman's hair looks.
Q4_1	Human Emotional	You see a boy making fun of his brother for getting dumped by his girlfriend.
Q5_1	Human Emotional	You see a man laughing as he passes a person with a disease that causes baldness.
Q6_1	Human Emotional	You see a girl saying that another girl is not pretty enough to be a varsity cheerleader.
Q2_8	Human Physical	You see a teacher hitting a student's hand with a ruler for falling asleep in class.
Q3_8	Human Physical	You see a woman spanking her child with a spatula for getting bad grades in school.
Q4_8	Human Physical	You see a girl pinch another girl so hard it leaves a bruise.
Q5_9	Human Physical	You see a boy throw a rock at another boy on the playground.
Q6_2	Human Physical	You see a boy placing a thumbtack sticking up on the chair of another student.
Q6_9	Human Physical	You see a girl whip a boy with a rope because she doesn't like him.
Q1_3	Justice	You see a student copying a classmate's answer sheet on a final exam.
Q2_3	Justice	You see a runner taking a shortcut on the course during the marathon in order to win.
Q3_3	Justice	You see someone cheating in a card game while playing with a group of strangers.
Q4_3	Justice	You see a referee intentionally making bad calls that help his favored team win.
Q5_3	Justice	You see a boy skipping to the front of the line because his friend is an employee.
Q6_3	Justice	You see a teacher giving a bad grade to a student just because he dislikes him.
Q1_4	Autonomy	You see a boy telling his girlfriend that she must change to his religion.
Q2_4	Autonomy	You see a mother telling her son that she is going to choose all of his friends.
Q3_4	Autonomy	You see a man forbidding his wife to wear clothing that he has not first approved.
Q4_4	Autonomy	You see a woman pressuring her daughter to become a famous evening news reporter.
Q6_4	Autonomy	You see a mother forcing her daughter to enroll as a medical student in college.
Q5_4	Autonomy	You see a public leader on TV trying to ban the wearing of hooded sweatshirts.
Q1_5	Authority	You see a girl repeatedly interrupting her teacher as he explains instructions.
Q2_5	Authority	You see a teenage girl coming home late and ignoring her parents' rules.
Q3_5	Authority	You see a boy turning up the TV as his father talks about his military service.
Q4_5	Authority	You see a teaching assistant talking back to the teacher in front of the classroom.
Q5_6	Authority	You see a student say that her teacher is a fool during an afternoon class.
Q6_5	Authority	You see a star player ignoring her coach's order to come to the bench during a game.
Q1_6	Loyalty	You see a coach celebrating with the other team's players who just won the game.

Q2_6	Loyalty	You see a former US General saying publicly he would never buy any American product.
Q3_6	Loyalty	You see a mayor saying that the neighboring town is a much better town.
Q4_6	Loyalty	You see a teacher publicly saying she hopes another school wins the math contest.
Q5_7	Loyalty	You see a head cheerleader booing her high school's team during a homecoming game.
Q6_7	Loyalty	You see an American telling foreigners that the US is an evil force in the world.
Q1_7	Sanctity	You see a teenage girl at the lunch table offer to kiss anyone on the lips.
Q2_7	Sanctity	You see a man collecting road kill for dinner.
Q3_7	Sanctity	You see a girl dating a man old enough to be her dad.
Q4_7	Sanctity	You see a boy spit on the floor in the hallway.
Q5_8	Sanctity	You see a man blow his nose into his shirt.
Q6_8	Sanctity	You see a woman not wash her hands after using a public toilet.
Q1_9	Norm	You see someone using an old cellphone and refusing to buy a new one.
Q2_9	Norm	You see a woman continuing to wear a large sun hat inside her apartment complex.
Q3_9	Norm	You see a man eating a bowl of cereal in the morning with water instead of milk.
Q4_9	Norm	You see a woman using a fork to eat a bowl of vanilla ice cream and marshmallows.
Q5_10	Norm	You see a man putting ketchup on his chicken salad while at lunch.
Q6_10	Norm	You see someone driving around in a dirty car that has not been washed recently.

Original Items of Standardized Database (Clifford et al., 2016)

carepa1	Animal Physical	You see a woman swerving her car in order to intentionally run over a squirrel.
carepa6	Animal Physical	You see a man lashing his pony with a whip for breaking loose from its pen.
carepa2	Animal Physical	You see a woman throwing her cat across the room for scratching the furniture.
carepa3	Animal Physical	You see someone leaving his dog outside in the rain after it dug in the trash.
carepa4	Animal Physical	You see a boy throwing rocks at cows that are grazing in the local pasture.
carepa5	Animal Physical	You see a zoo trainer jabbing a dolphin to get it to entertain his customers.
care1	Human Emotional	You see a teenage boy chuckling at an amputee he passes by while on the subway.
care2	Human Emotional	You see a girl laughing at another student forgetting her lines at a school play.
care3	Human Emotional	You see a woman commenting out loud about how fat another woman looks in her jeans.
care10	Human Emotional	You see a boy making fun of his brother for getting dumped by his girlfriend.
care7	Human Emotional	You see a man snickering as he passes by a cancer patient with a bald head.
care8	Human Emotional	You see a girl saying that another girl is too ugly to be a varsity cheerleader.
careph14	Human Physical	You see a teacher hitting a student's hand with a ruler for falling asleep in class.
careph15	Human Physical	You see a woman spanking her child with a spatula for getting bad grades in school.
careph13	Human Physical	You see a woman slapping another woman who she is arguing with in the parking lot.

careph10	Human Physical	You see a woman throwing a stapler at her colleague who is snoring during her talk.
careph12	Human Physical	You see a boy placing a thumbtack sticking up on the chair of another student.
careph11	Human Physical	You see a girl throwing her hot coffee on a woman who is dating her ex-boyfriend.
fair1	Justice	You see a student copying a classmate's answer sheet on a makeup final exam.
fair2	Justice	You see a runner taking a shortcut on the course during the marathon in order to win.
fair5	Justice	You see someone cheating in a card game while playing with a group of strangers.
fair6	Justice	You see a referee intentionally making bad calls that help his favored team win.
fair14	Justice	You see a boy skipping to the front of the line because his friend is an employee.
fair16	Justice	You see a professor giving a bad grade to a student just because he dislikes him.
libt5	Autonomy	You see a man telling his girlfriend that she must convert to his religion.
libt6	Autonomy	You see a mother telling her son that she is going to choose all of his friends.
libt7	Autonomy	You see a man forbidding his wife to wear clothing that he has not first approved.
libt10	Autonomy	You see a woman pressuring her daughter to become a famous evening news anchor.
libt11	Autonomy	You see a public leader on TV trying to ban the wearing of hooded sweatshirts.
libt12	Autonomy	You see a mother forcing her daughter to enroll as a pre-med student in college.
auth3	Authority	You see a girl repeatedly interrupting her teacher as he explains a new concept.
auth6	Authority	You see a teenage girl coming home late and ignoring her parents' strict curfew.
auth11	Authority	You see a boy turning up the TV as his father talks about his military service.
auth12	Authority	You see a teaching assistant talking back to the teacher in front of the classroom.
auth16	Authority	You see a student stating that her professor is a fool during an afternoon class.
auth17	Authority	You see a star player ignoring her coach's order to come to the bench during a game.
loya2	Loyalty	You see a coach celebrating with the opposing team's players who just won the game.
loya3	Loyalty	You see a former US General saying publicly he would never buy any American product.
loya4	Loyalty	You see a mayor saying that the neighboring town is a much better town.
loya7	Loyalty	You see a teacher publicly saying she hopes another school wins the math contest.
loya8	Loyalty	You see a head cheerleader booing her high school's team during a homecoming game.
loya13	Loyalty	You see an American telling foreigners that the US is an evil force in the world.
sanc8	Sanctity	You see a homosexual in a gay bar offering sex to anyone who buys him a drink.
sanc9	Sanctity	You see an employee at a morgue eating his pepperoni pizza off of a dead body.
sanc14	Sanctity	You see two first cousins getting married to each other in an elaborate wedding.
sanc17	Sanctity	You see a college student drinking until she vomits on herself and falls asleep.
sanc12	Sanctity	You see a woman burping and farting loudly while eating at a fast food truck.
sanc6	Sanctity	You see a teenage male in a dorm bathroom secretly using a stranger's toothbrush.

Appendix D

		
Date:	November 5, 2018	
TO:	Brandon Bretl, (bretl.b@ku.edu)	
FROM:	Jocelyn Isley, MS, CIP, IRB Administrator (785-864-7385, irb@ku.edu)	
RE:	Approval of Modification	
The IRB reviewed the submission referenced below on 11/5/2018. Approval expires on 5/8/2019.		
IRB Action: APPROVED	Effective date: 11/5/2018	Expiration Date : 5/8/2019
STUDY DETAILS		
Investigator:	Brandon Bretl	
IRB ID:	STUDY00142366	
Title of Study:	Character Foundations Survey (CFS) Reliability and Validation Study	
Funding ID:	None	
REVIEW INFORMATION		
Review Type:	Modification	
Review Date:	11/5/2018	
Documents Reviewed:	• Modification - September 2018	
Expedited Category(ies):	• (7)(b) Social science methods • (nm) Minor modification • (7)(s) Behavioral research	
Special Determinations:	• Children • Waiver of consent documentation	
Additional Information:		
<p>KEY PROCEDURES AND GUIDELINES. Consult our website for additional information.</p> <ol style="list-style-type: none"> Approved Consent Form: You must use the final, watermarked version of the consent form, available under the "Documents" tab, "Final" column, in eCompliance. Participants must be given a copy of the form. Continuing Review and Study Closure: Submit a Continuing Review request and required attachments at least 4 weeks in advance of the expiration date. If Continuing Review is not approved before 5/8/2019, the study approval will expire on that date and all human subjects research activities must stop. Please close your study to IRB oversight once your study meets the first 4 milestones, as outlined in the Closing a Study guidance. Modifications: Prior to making any significant changes to the project, a Modification request must be submitted and approved. Add Study Team Member: Complete a study team modification if you need to add investigators not named in original application. Note that new investigators must take the online tutorial prior to being approved to work on the project. Data Security: University data security and handling requirements apply to your project. Submit a Report of New Information (RNI): If a subject is injured in the course of the research procedure or there is a breach of participant information, an RNI must be submitted immediately. Potential non-compliance may also be reported through the RNI process. Consent Records: When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. Study Records must be kept a minimum of three years after the completion of the research. Funding agencies may have retention requirements that exceed three years. 		
<p>Human Research Protection Program Youngberg Hall 2385 Irving Hill Rd Lawrence, KS 66045 (785) 864-7429 research.ku.edu/hrpp</p>		



CFS Instruction Page

PLEASE NOTE: Student answers are confidential. No identifiable information can be collected about who takes or does not take the survey, and teachers should not look over students' shoulders to see their answers.

School Name: [INSERT SCHOOL NAME HERE]

Test Administration Procedure and Script

1. Write your school code on the board. Students will need this to access the survey.

Your school code: **1234**

2. **READ:** *This survey is an opportunity for you to express your feelings about what is right and wrong. The survey contains situations that some students might consider wrong, but all scenarios have been judged to be appropriate for students at your age. The survey is confidential and no personally identifying information will be recorded. Do not look at other students' responses or share your responses with others.*

3. Have students access the survey at the following website:

https://kusurvey.ca1.qualtrics.com/jfe/form/SV_bQK4QR26vDQV11b

This link can be posted online, written on the board, emailed to students, or handed to them in a handout.

4. Allow students to complete the survey, work on homework, or work on the alternative assignment. The survey should take about 10-15 minutes, but it might be a good idea to allow 20-30 minutes.
5. Ensure students remain silent during the duration of the survey, and ensure that all students are allowed to finish before students resume talking.
6. After all students have finished, **READ:** *If any of the questions in the survey triggered a response or made you feel uncomfortable and there is something you feel you need to talk to a counselor about, remember the school has trained counselors to help you with your problems. If ever you feel you need to talk to a counselor, tell a teacher you trust.*
7. Feel free to hold a classroom discussion based on the survey and the character development education standards and resources provided. You will receive additional resources once the results from the surveys are analyzed.

Questions, comments, or concerns?
Contact Brandon Bretl at bretl.b@ku.edu



CFS Assent and Debrief Text for Survey

Assent form (prior to survey):

This is a survey designed to allow you to express your feelings about what is right and wrong. It should take you about 10-15 minutes to finish. You do not have to take this survey. Your name will not be attached to this survey in anyway, so no one will be able to know what you answer. The survey contains situations that you might think are wrong, but all are appropriate for someone your age. The situations might be similar to things you have experienced or seen others experience.

You can send any questions, comments, or concerns about the survey to bretl.b@ku.edu

I have read the above paragraph and want to take the survey [check box to proceed]

[CLICK HERE](#) to enter the survey.

Debrief form (end of the survey):

Thank you for completing the survey. The situations in the survey might have been similar to things you have experienced or seen others experience. If any of the questions in the survey made you feel uncomfortable, the school has trained counselors to help you. If ever you feel you want to talk to a counselor, tell a teacher you trust.

You can send any questions, comments, or concerns about the survey to bretl.b@ku.edu



Parent Information Sheet for the Character Foundations Research Study

Dear Parents,

Over the next couple of weeks, your child might be offered the opportunity to participate in a research study through the University of Kansas. The study consists of a survey that some students will be offered the opportunity to take in study hall. The survey is designed to investigate issues related to character development and judgments of the degree of wrongness of various situations children are likely to encounter in school. Results of the survey will be used to better understand the climate of the school environment and tailor school improvement plans.

Participation in the survey is completely optional. No identifying information will be recorded, meaning not even the researchers will be able to identify who participated in the survey, and no record of who takes or does not take the survey will be taken. The research study and survey have been approved by the University of Kansas Institutional Review Board and have been deemed to pose no serious risk for students. If for some reason a student should find the survey or any other experience in school emotionally triggering, school counselors are available during school hours to provide counseling services.

If for any reason you would prefer your child not be offered the opportunity to participate in this study, please contact the front office to opt-out.

If you have any questions about the study or the survey, you can contact the principal investigator of the study, Brandon Bretl, via e-mail at Bretl.B@ku.edu.

Appendix E

R Printout of Factor Loadings from Adult Data

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
Animal Physical =~						
carepa1	1.000				0.593	0.510
carepa6	1.172	0.119	9.830	0.000	0.695	0.663
carepa2	1.136	0.122	9.320	0.000	0.674	0.723
carepa3	1.225	0.145	8.471	0.000	0.727	0.574
carepa4	1.110	0.105	10.555	0.000	0.659	0.753
carepa5	1.132	0.109	10.367	0.000	0.672	0.753
Human Physical =~						
careph14	1.000				0.756	0.579
careph15	0.874	0.066	13.279	0.000	0.660	0.537
careph13	0.894	0.090	9.939	0.000	0.676	0.599
careph10	0.994	0.085	11.665	0.000	0.752	0.723
careph12	0.797	0.087	9.183	0.000	0.602	0.688
careph11	0.769	0.090	8.574	0.000	0.581	0.551
Human Emotional =~						
care1	1.000				0.694	0.752
care2	1.190	0.101	11.784	0.000	0.826	0.723
care3	1.217	0.090	13.513	0.000	0.845	0.776
care10	1.032	0.108	9.540	0.000	0.716	0.629
care7	0.905	0.055	16.543	0.000	0.629	0.660
care8	1.161	0.092	12.563	0.000	0.806	0.770
Justice =~						
fair1	1.000				0.697	0.730
fair2	0.962	0.062	15.416	0.000	0.670	0.748
fair5	0.909	0.070	12.953	0.000	0.634	0.655
fair6	0.857	0.065	13.119	0.000	0.597	0.707
fair14	0.950	0.079	12.075	0.000	0.662	0.646
fair16	0.629	0.073	8.659	0.000	0.438	0.598
Liberty =~						
Libertyt5	1.000				0.777	0.663
Libertyt6	0.910	0.077	11.783	0.000	0.707	0.637
Libertyt7	0.990	0.068	14.509	0.000	0.770	0.700
Libertyt10	1.078	0.097	11.099	0.000	0.838	0.709
Libertyt11	0.978	0.086	11.358	0.000	0.760	0.565
Libertyt12	1.037	0.094	11.039	0.000	0.806	0.724

Authority =~

Authority3	1.000				0.795	0.713
Authority6	0.967	0.066	14.670	0.000	0.769	0.702
Authority11	0.995	0.079	12.641	0.000	0.791	0.646
Authority12	1.091	0.070	15.682	0.000	0.867	0.781
Authority16	1.123	0.070	15.946	0.000	0.893	0.722
Authority17	1.019	0.070	14.570	0.000	0.810	0.720

Loyalty =~

Loyalty2	1.000				0.750	0.580
Loyalty3	1.211	0.105	11.489	0.000	0.909	0.686
Loyalty4	1.166	0.092	12.614	0.000	0.875	0.721
Loyalty7	1.235	0.092	13.490	0.000	0.927	0.810
Loyalty8	1.170	0.092	12.682	0.000	0.878	0.759
Loyalty13	1.220	0.116	10.482	0.000	0.916	0.687

Sanctity =~

Sanctity8	1.000				0.788	0.612
Sanctity9	0.686	0.081	8.479	0.000	0.540	0.513
Sanctity14	0.928	0.085	10.895	0.000	0.731	0.594
Sanctity17	1.029	0.092	11.218	0.000	0.810	0.614
Sanctity12	1.023	0.109	9.423	0.000	0.806	0.616
Sanctity6	0.857	0.095	9.050	0.000	0.675	0.623

Appendix F

Models	Test of $-2\Delta LL$ Difference							
	Model H0 LL	H0 LL Scale Factor	# Free Param.	Diff in LL * -2	Diff Scaling Correct.	Scaled Diff in - 2LL	DF Diff	Exact P- Value
6 Animal Physical	-6,637.459	1.3130	18					
6 Animal Physical Q4_2 ~~ Q5_2	-6,636.079	1.3180	19					
Test of Difference				2.760	1.4080	1.960	1	0.1615
6 Human Physical	-6,556.406	1.2020	18					
6 Human Physical, Q2_8 ~~ Q3_8	-6,535.446	1.1890	19					
Test of Difference				41.920	0.9550	43.895	1	0.0000
6 Human Physical	-6,535.446	1.1890	19					
6 Human Physical, Q3_8 ~~ Q4_8	-6,530.805	1.1920	20					
Test of Difference				9.282	1.2490	7.432	1	0.0064
6 Human Physical	-6,530.805	1.1920	20					
6 Human Physical, Q5_9 ~~ Q6_9	-6,527.692	1.2090	21					
Test of Difference				6.226	1.5490	4.019	1	0.0450
6 Human Physical	-6,527.692	1.2090	21					
6 Human Physical, Q4_8 ~~ Q6_9	-6,524.729	1.2330	22					
Test of Difference				5.926	1.7370	3.412	1	0.0647
6 Human Emotional	-6,016.700	1.3350	18					
6 Human Emotional, Q1_1 ~~ Q5_1	-5,999.044	1.3360	19					
Test of Difference				35.312	1.3540	26.080	1	0.0000
6 Human Emotional	-5,999.044	1.3360	19					
6 Human Emotional, Q5_1 ~~ Q6_1	-5,992.640	1.3240	20					
Test of Difference				12.808	1.0960	11.686	1	0.0006
6 Human Emotional	-5,992.640	1.3240	20					
6 Human Emotional, Q1_1 ~~ Q3_1	-5,989.413	1.3150	21					
Test of Difference				6.454	1.1350	5.686	1	0.0171
6 Human Emotional	-5,989.413	1.3150	21					
6 Human Emotional, Q1_1 ~~ Q4_1	-5,988.082	1.3060	22					
Test of Difference				2.662	1.1170	2.383	1	0.1226
6 Justice	-6,532.843	1.1520	18					
6 Justice, Q4_3 ~~~ Q6_3	-6,515.484	1.1790	19					
Test of Difference				34.718	1.6650	20.852	1	0.0000

6 Justice	-6,515.484	1.1790	19					
6 Justice, Q1_3 ~ Q4_3	-6,508.970	1.1780	20					
Test of Difference				13.028	1.1590	11.241	1	0.0008
6 Justice	-6,508.970	1.1780	20					
6 Justice, Q3_3 ~ Q4_3	-6,504.487	1.1780	21					
Test of Difference				8.966	1.1780	7.611	1	0.0058
6 Justice	-6,504.487	1.1780	21					
6 Justice, Q1_3 ~ Q5_3	-6,500.523	1.1680	22					
Test of Difference				7.928	0.9580	8.276	1	0.0040
6 Justice	-6,500.523	1.1680	22					
6 Justice, Q3_3 ~ Q5_3	-6,499.594	1.1810	23					
Test of Difference				1.858	1.4670	1.267	1	0.2604
6 Liberty	-7,365.341	1.0200	18					
6 Liberty, Q4_4 ~ Q6_4	-7,332.989	1.0140	19					
Test of Difference				64.704	0.9060	71.417	1	0.0000
6 Liberty	-7,332.989	1.0140	19					
6 Liberty, Q1_4 ~ Q5_4	-7,330.401	1.0170	20					
Test of Difference				5.176	1.0740	4.819	1	0.0281
6 Liberty	-7,330.401	1.0170	20					
6 Liberty, Q3_4 ~ Q4_4	-7,327.971	1.0250	21					
Test of Difference				4.860	1.1850	4.101	1	0.0429
6 Liberty	-7,327.971	1.0250	21					
6 Liberty, Q2_4 ~ Q6_4	-7,326.818	1.0340	22					
Test of Difference				2.306	1.2230	1.886	1	0.1697
6 Authority	-6,564.684	1.0680	18					
6 Authority, Q1_5 ~ Q2_5	-6,550.297	1.0720	19					
Test of Difference				28.774	1.1440	25.152	1	0.0000
6 Authority	-6,550.297	1.0720	19					
6 Authority, Q3_5 ~ Q5_6	-6,544.671	1.0690	20					
Test of Difference				11.252	1.0120	11.119	1	0.0009
6 Authority	-6,544.671	1.0690	20					
6 Authority, Q1_5 ~ Q3_5	-6,540.164	1.0660	21					
Test of Difference				9.014	1.0060	8.960	1	0.0028
6 Authority	-6,540.164	1.0660	21					
6 Authority, Q5_6 ~ Q6_5	-6,538.785	1.0680	22					
Test of Difference				2.758	1.1100	2.485	1	0.1150
6 Loyalty	-7,351.913	0.9670	18					
6 Loyalty, Q5_7 ~ Q6_7	-7,345.150	0.9890	19					
Test of Difference				13.526	1.3850	9.766	1	0.0018

6 Loyalty	-7,345.150	0.9890	19					
6 Loyalty, Q2_6 ~ Q6_7	-7,337.506	1.0090	20					
Test of Difference				15.288	1.3890	11.006	1	0.0009
6 Loyalty	-7,337.506	1.0090	20					
6 Loyalty, Q2_6 ~ Q3_6	-7,334.215	1.0180	21					
Test of Difference				6.582	1.1980	5.494	1	0.0191
6 Loyalty	-7,334.215	1.0180	21					
6 Loyalty, Q3_6 ~ Q6_7	-7,332.895	1.0220	22					
Test of Difference				2.640	1.1060	2.387	1	0.1223
6 Sanctity	-7,667.596	0.9310	18					
6 Sanctity Q1_7 ~ Q4_7	-7,658.519	0.9380	19					
Test of Difference				18.154	1.0640	17.062	1	0.0000
6 Sanctity	-7,658.519	0.9380	19					
6 Sanctity Q1_7 ~ Q7_7	-7,651.446	0.9400	20					
Test of Difference				14.146	0.9780	14.464	1	0.0001
6 Sanctity	-7,651.446	0.9400	20					
6 Sanctity Q1_7 ~ Q5_8	-7,648.818	0.9460	21					
Test of Difference				5.256	1.0660	4.931	1	0.0264
6 Sanctity	-7,648.818	0.9460	21					
6 Sanctity Q2_7 ~ Q3_7	-7,646.172	0.9530	22					
Test of Difference				5.292	1.1000	4.811	1	0.0283
6 Sanctity	-7,646.172	0.9530	22					
6 Sanctity Q3_7 ~ Q4_7	-7,644.722	0.9560	23					
Test of Difference				2.900	1.0220	2.838	1	0.0921
6 Sanctity	-7,646.172	0.9530	22					
6 Sanctity Q3_7 ~ Q4_7	-7,644.722	0.9560	23					
Test of Difference				2.900	1.0220	2.838	1	0.0921

Appendix G

6 Factor EFA Loadings, Adolescent Data

Item	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Q1_2	0.107	0.358	0.068	-0.052	-0.107	0.070
Q1_8	0.016	0.694	-0.094	-0.058	-0.081	0.062
Q2_2	-0.138	0.738	0.063	-0.012	-0.094	0.067
Q3_2	-0.029	0.549	-0.074	0.078	0.104	0.005
Q4_2	0.151	0.501	0.186	-0.109	0.135	-0.148
Q5_2	-0.129	0.565	0.223	0.020	0.019	-0.028
Q2_8	0.103	0.363	0.107	-0.054	-0.046	0.025
Q3_8	0.139	0.433	-0.192	0.124	0.026	0.027
Q4_8	0.349	0.133	0.233	0.049	0.014	-0.082
Q5_9	0.366	0.173	0.304	-0.072	0.072	-0.141
Q6_2	0.092	0.117	0.642	-0.097	0.020	-0.116
Q6_9	-0.026	0.200	0.668	-0.011	-0.105	0.005
Q1_1	0.154	0.059	0.416	0.029	-0.213	0.047
Q2_1	0.617	0.059	-0.036	0.224	-0.155	0.039
Q3_1	0.522	-0.012	-0.078	0.256	0.166	-0.055
Q4_1	0.387	0.162	-0.081	0.321	0.020	-0.093
Q5_1	0.090	0.156	0.391	0.086	0.018	-0.024
Q6_1	0.219	0.017	0.299	0.318	0.112	-0.159
Q1_3	0.802	-0.054	0.040	-0.174	-0.257	0.100
Q2_3	0.470	-0.160	0.198	0.144	-0.165	0.118
Q3_3	0.579	-0.054	-0.102	0.134	0.046	0.023
Q4_3	-0.041	-0.163	0.448	0.187	0.057	0.178
Q5_3	0.331	0.010	-0.049	0.208	0.228	-0.009
Q6_3	-0.070	-0.085	0.683	0.062	0.059	-0.006
Q1_4	0.074	0.113	0.084	0.323	-0.205	0.161
Q2_4	-0.228	0.055	0.048	0.490	-0.068	0.264
Q3_4	0.011	0.219	-0.126	0.497	-0.095	0.104
Q4_4	0.069	-0.036	-0.037	0.730	-0.004	-0.074
Q5_4	-0.285	0.093	0.056	0.232	0.350	0.119
Q6_4	-0.009	-0.038	0.137	0.666	-0.091	0.009
Q1_5	0.733	-0.040	-0.196	-0.130	0.089	0.148
Q2_5	0.584	-0.047	0.050	-0.096	-0.039	0.168
Q3_5	0.145	0.119	0.156	0.074	0.097	0.175
Q4_5	0.353	0.015	0.034	0.101	0.150	0.185
Q5_6	0.617	0.067	0.011	-0.026	0.187	-0.070

Q6_5	0.210	-0.045	0.253	0.000	0.249	0.137
Q1_6	0.037	-0.079	-0.065	0.050	0.024	0.443
Q2_6	0.078	0.032	-0.054	-0.135	0.098	0.552
Q3_6	0.067	0.101	-0.101	0.038	0.083	0.500
Q4_6	0.107	-0.063	0.000	0.173	0.199	0.432
Q5_7	0.239	-0.086	0.242	0.019	0.249	0.216
Q6_7	0.049	0.137	0.267	-0.095	0.103	0.241
Q1_7	0.589	-0.025	-0.011	-0.106	-0.100	0.090
Q2_7	-0.007	0.147	-0.037	-0.171	0.199	0.305
Q3_7	-0.006	0.024	0.114	-0.062	0.168	0.211
Q4_7	0.451	-0.093	0.070	-0.011	0.296	-0.081
Q5_8	-0.104	0.017	-0.111	-0.104	0.636	0.215
Q6_8	0.031	-0.083	0.044	-0.095	0.634	0.126

8-Factor EFA Loadings, Adolescent Data

Item	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Q1_2	0.123	0.423	-0.017	-0.070	-0.061	-0.010	0.212	-0.025
Q1_8	0.020	0.735	-0.130	-0.075	-0.022	-0.021	0.111	0.110
Q2_2	-0.143	0.733	0.053	-0.007	0.016	-0.044	0.103	0.159
Q3_2	-0.013	0.591	-0.081	0.060	0.015	0.049	-0.051	0.090
Q4_2	0.177	0.606	0.161	-0.168	-0.098	0.013	-0.054	-0.024
Q5_2	-0.119	0.660	0.178	-0.032	0.019	-0.074	0.015	-0.013
Q2_8	0.072	0.201	0.222	0.036	-0.040	0.090	0.059	0.381
Q3_8	0.102	0.229	-0.014	0.231	0.092	0.052	-0.178	0.535
Q4_8	0.326	-0.011	0.385	0.098	0.059	-0.085	-0.130	0.264
Q5_9	0.370	0.183	0.357	-0.103	0.007	-0.099	-0.111	0.032
Q6_2	0.086	0.089	0.671	-0.087	-0.024	-0.065	0.023	0.027
Q6_9	-0.048	0.135	0.690	0.025	0.055	-0.115	0.126	0.093
Q1_1	0.177	0.122	0.275	0.034	-0.183	-0.005	0.448	-0.136
Q2_1	0.624	0.016	-0.032	0.248	-0.032	-0.079	0.155	0.100
Q3_1	0.544	-0.051	-0.029	0.283	-0.049	0.123	-0.055	0.106
Q4_1	0.392	0.136	-0.025	0.318	-0.008	-0.071	-0.091	0.115
Q5_1	0.109	0.179	0.343	0.095	-0.080	0.047	0.160	-0.023
Q6_1	0.242	-0.004	0.311	0.345	-0.158	0.090	0.029	0.037
Q1_3	0.793	-0.081	0.026	-0.166	0.038	-0.173	0.189	0.040
Q2_3	0.493	-0.102	0.099	0.122	0.062	-0.136	0.223	-0.139
Q3_3	0.596	-0.062	-0.090	0.135	0.004	0.038	0.007	0.030
Q4_3	-0.011	-0.058	0.317	0.156	0.144	0.023	0.193	-0.252
Q5_3	0.376	0.103	-0.079	0.159	0.096	0.030	-0.149	-0.106

Q6_3	-0.072	-0.148	0.682	0.124	-0.063	0.128	0.169	0.016
Q1_4	0.100	0.159	-0.052	0.344	-0.042	-0.018	0.362	-0.049
Q2_4	-0.226	0.021	0.015	0.522	0.214	-0.013	0.144	0.050
Q3_4	0.030	0.239	-0.178	0.503	0.053	-0.063	0.111	0.038
Q4_4	0.072	-0.123	0.021	0.781	-0.062	0.011	-0.016	0.149
Q5_4	-0.243	0.152	0.012	0.230	0.082	0.293	-0.036	-0.050
Q6_4	-0.002	-0.068	0.132	0.683	0.023	-0.085	0.077	0.042
Q1_5	0.752	-0.043	-0.193	-0.128	0.069	0.116	0.049	0.032
Q2_5	0.603	-0.064	0.018	-0.077	0.037	0.066	0.199	0.022
Q3_5	0.186	0.229	0.049	0.035	0.131	0.049	0.122	-0.142
Q4_5	0.375	0.046	0.026	0.077	0.246	0.021	-0.034	-0.027
Q5_6	0.644	0.092	0.056	-0.063	0.056	0.000	-0.167	0.014
Q6_5	0.247	0.019	0.206	-0.022	0.155	0.142	0.000	-0.110
Q1_6	0.021	-0.091	-0.066	0.033	0.497	-0.039	0.008	-0.006
Q2_6	0.058	0.005	-0.031	-0.153	0.619	0.002	-0.009	0.039
Q3_6	0.039	0.089	-0.064	-0.008	0.702	-0.127	-0.121	0.045
Q4_6	0.086	-0.108	0.059	0.154	0.655	-0.028	-0.175	0.047
Q5_7	0.262	-0.029	0.220	-0.022	0.319	0.060	-0.054	-0.131
Q6_7	0.027	0.045	0.342	-0.062	0.301	0.049	-0.009	0.154
Q1_7	0.603	-0.040	-0.042	-0.089	-0.046	0.028	0.196	0.027
Q2_7	-0.015	0.068	0.010	-0.121	0.211	0.279	0.035	0.170
Q3_7	0.008	-0.013	0.099	-0.015	0.071	0.276	0.132	0.056
Q4_7	0.495	-0.051	0.060	-0.014	-0.108	0.237	-0.042	-0.052
Q5_8	-0.051	0.059	-0.162	-0.070	-0.004	0.750	-0.008	-0.012
Q6_8	0.065	-0.131	0.060	-0.025	-0.112	0.829	-0.012	0.087

Appendix H

R Printout of Loadings, Covariances, and Intercepts of CFS-3

Loading	Statistics					
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
factor2 =~						
Q1_8	1.000				0.620	0.578
Q2_2	1.053	0.071	14.743	0.000	0.653	0.673
Q3_2	1.044	0.091	11.531	0.000	0.647	0.599
Q4_2	1.016	0.084	12.082	0.000	0.630	0.619
Q5_2	0.986	0.077	12.871	0.000	0.611	0.664
factor4 =~						
Q2_4	1.000				0.649	0.542
Q3_4	1.086	0.082	13.216	0.000	0.704	0.613
Q4_4	1.060	0.093	11.380	0.000	0.688	0.584
Q6_4	1.016	0.087	11.710	0.000	0.659	0.595
factor6 =~						
Q1_6	1.000				0.549	0.428
Q2_6	1.123	0.128	8.783	0.000	0.616	0.486
Q3_6	1.364	0.148	9.237	0.000	0.748	0.630
Q4_6	1.556	0.153	10.162	0.000	0.854	0.757

Covariances	Statistics					
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.Q4_4 ~~						
.Q6_4	0.293	0.047	6.182	0.000	0.293	0.343
factor2 ~~						
factor4	0.289	0.033	8.721	0.000	0.718	0.718
factor6	0.153	0.021	7.158	0.000	0.449	0.449
factor4 ~~						
factor6	0.230	0.032	7.294	0.000	0.647	0.647

Intercepts	Statistics					
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.Q1_8	4.167	0.037	113.245	0.000	4.167	3.884
.Q2_2	4.327	0.033	129.949	0.000	4.327	4.457
.Q3_2	3.998	0.037	107.778	0.000	3.998	3.697
.Q4_2	4.005	0.035	114.750	0.000	4.005	3.936
.Q5_2	4.414	0.032	139.806	0.000	4.414	4.795

.Q2_4	3.611	0.041	87.934	0.000	3.611	3.016
.Q3_4	3.625	0.039	91.928	0.000	3.625	3.153
.Q4_4	3.216	0.040	79.584	0.000	3.216	2.730
.Q6_4	3.629	0.038	95.466	0.000	3.629	3.274
.Q1_6	2.152	0.044	48.927	0.000	2.152	1.678
.Q2_6	2.699	0.043	62.139	0.000	2.699	2.131
.Q3_6	2.549	0.041	62.597	0.000	2.549	2.147
.Q4_6	2.955	0.039	76.427	0.000	2.955	2.621
factor2	0.000				0.000	0.000
factor4	0.000				0.000	0.000
factor6	0.000				0.000	0.000

Variances	Statistics					
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.Q1_8	0.766	0.051	14.883	0.000	0.766	0.666
.Q2_2	0.516	0.045	11.478	0.000	0.516	0.547
.Q3_2	0.750	0.049	15.403	0.000	0.750	0.641
.Q4_2	0.638	0.047	13.550	0.000	0.638	0.617
.Q5_2	0.474	0.048	9.865	0.000	0.474	0.559
.Q2_4	1.012	0.071	14.315	0.000	1.012	0.706
.Q3_4	0.825	0.061	13.483	0.000	0.825	0.624
.Q4_4	0.915	0.060	15.219	0.000	0.915	0.659
.Q6_4	0.794	0.055	14.488	0.000	0.794	0.646
.Q1_6	1.343	0.067	20.141	0.000	1.343	0.817
.Q2_6	1.224	0.064	19.030	0.000	1.224	0.763
.Q3_6	0.850	0.064	13.389	0.000	0.850	0.603
.Q4_6	0.542	0.057	9.533	0.000	0.542	0.426
factor2	0.385	0.053	7.212	0.000	1.000	1.000
factor4	0.421	0.057	7.391	0.000	1.000	1.000
factor6	0.301	0.055	5.435	0.000	1.000	1.000

Appendix I*R Printout of Invariance Testing Fit Indices*

Model	Statistics								
	CHISQ	DF	PVALUE	CFI	TLI	AIC	BIC	RMSEA	SRMR
Configural	325.702	244.000	0.000	0.968	0.959	31344.299	32160.479	0.040	0.047
Metric	365.067	274.000	0.000	0.965	0.960	31323.664	31997.487	0.040	0.055
Scalar	427.583	304.000	0.000	0.952	0.951	31326.179	31857.646	0.044	0.059