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Distress tolerance in perinatal women: concurrent and longitudinal associations with maternal responsiveness

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DISTRESS TOLERANCE IN PERINATAL WOMEN: CONCURRENT AND LONGITUDINAL ASSOCIATIONS WITH MATERNAL RESPONSIVENESS

by

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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For my daughter, Natalie. I hope that you will always dream big. I will forever be by your side on whatever path you choose in life. You are my sunshine.

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ABSTRACT

Maternal responsiveness to infant needs is critical to child development. Few studies have attempted to identify basic processes that underlie responsiveness. Parenting theory suggests that distress tolerance (DT) may be important to understanding dysfunctional parenting. Distress tolerance refers to an individual's ability to withstand subjective internal distress (e.g., uncomfortable thoughts, feelings). Despite its significance in the study of psychopathology, DT is not a well validated construct. Thus, the primary objectives of the present study were 1) to validate the construct of DT in a sample of perinatal women, and 2) to examine the concurrent and longitudinal associations between perinatal DT and maternal responsiveness. Eighty-six pregnant women in their third trimester and their respective informants completed an online survey of DT. At 4-months postpartum, a research team collected observational assessments of maternal responsiveness and a second assessment of self-reported DT. Factorial validity of DT was demonstrated through confirmatory factor analysis and suggested that DT is best represented as a multidimensional construct. Convergent validity of DT was demonstrated by small to moderate correlations (*r*'s = .16-.53) between self- and informant ratings of DT. Results of path analyses demonstrated a small association (*r*=.19) between prenatal DT and responsiveness; however, no association was found between postpartum DT and responsiveness. These findings suggest that targeting DT during pregnancy may improve outcomes for women and their infants. Distress tolerance skills are used in a number of empirically supported psychotherapies. Similarly, these skills could be incorporated into existing prenatal programs and parenting interventions to increase responsiveness and, ultimately, improve child outcomes.

PUBLIC ABSTRACT

Maternal responsiveness to infant needs is an important factor in determining the trajectory of a child's development. There is strong evidence that certain groups of women are at risk for compromised responsiveness to their infants, e.g.—women affected by depression and marital discord. In contrast, few studies have identified deficits that are common across these at-risk groups. It is critical to identify the common deficits responsible for poor maternal responsiveness in order to improve the effectiveness of parenting interventions for at-risk groups. Parenting theory suggests that distress tolerance (DT), or a person's ability to withstand subjective distress, may be important to understanding parenting. Despite the widespread acknowledgement of DT as a parenting relevant construct, no study has tested this hypothesis. Thus, the objective of this dissertation was to examine the association between DT and maternal responsiveness. Eighty-six pregnant women in their third trimester completed an online survey of DT. At 4-months postpartum, a research team collected observational assessments of maternal responsiveness and a second assessment of self-reported DT. Results demonstrated a small association between prenatal DT and maternal responsiveness. No association was found between postpartum DT and responsiveness. These findings suggest that targeting DT during pregnancy may improve outcomes for women and their infants. Distress tolerance skills are used in a number of empirically supported psychotherapies. Similarly, these skills could be incorporated into existing prenatal programs and parenting interventions. In sum, the present findings can be used to enhance interventions aimed at increasing maternal responsiveness and, ultimately, improving child outcomes.

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LIST OF ABBREVIATIONS

DI: discomfort intolerance

DIS: Discomfort Intolerance Scale

DIS-DA: Discomfort Intolerance Scale- Discomfort Avoidance subscale

DIS-DI: Discomfort Intolerance Scale- Discomfort Intolerance subscale

DT: distress tolerance

DTS: Distress Tolerance Scale

FD: frustration discomfort

FDS: Frustration Discomfort Scale

FDS-A: Frustration Discomfort Scale- Achievement subscale

FDS-DI: Frustration Discomfort Scale- Discomfort Intolerance subscale

FDS-DI: Frustration Discomfort Scale- Emotional Intolerance subscale

FDS-DI: Frustration Discomfort Scale- Entitlement subscale

IU: intolerance of uncertainty

IUS: Intolerance of Uncertainty Scale

IUS-IA: Intolerance of Uncertainty Scale- Inhibitory Anxiety subscale

IUS-PA: Intolerance of Uncertainty Scale- Prospective Anxiety subscale

LTE-Q: List of Threatening Experiences Questionnaire

MSTAT-II: Multiple Stimulus Types Ambiguity Tolerance Scale-II

TNE: tolerance of negative emotions

TOA: tolerance of ambiguity

CHAPTER ONE: INTRODUCTION

Maternal responsiveness to infant needs is understood to be an important factor in determining the trajectory of a child's development (Bornstein & Tamis-LeMonda, 1989; Grolnick & Farkas, 2002). Substantial empirical evidence has identified specific groups of women whose responsiveness is compromised—e.g. those affected by depression, poverty, and marital discord (Cummings & Davies, 1994; Erel & Burman, 1995; Evans, 2004). In contrast, few studies have identified individual processes that explain dysfunctional parenting. Indeed, current research emphasizes the identification of risk factors and at-risk groups, while little work has focused on elucidating common processes that are at risk across these groups (Teti & Cole, 2011). It is valuable to identify the basic processes responsible for poor maternal responsiveness to enhance existing parenting interventions and further inform the selection of treatment targets for at-risk groups of parents. Furthermore, from a prevention perspective it is important to identify processes that may be targeted prior to the first mother-child encounter (e.g., during pregnancy) before maladaptive exchanges become engrained in the dyad's interactions. Therefore, the goal of this dissertation study was to identify a process that underlies maternal responsiveness. Findings from this study may inform existing parenting interventions, thereby improving child developmental outcomes.

Researchers have proposed distress tolerance (DT) as a construct that may be important to understanding patterns of dysfunctional parenting (Ben-Porath, 2010; Russell & Fechter-Leggett, 2012). Distress tolerance is defined as an individual's ability to withstand subjective internal distress (e.g., thoughts, emotions, physical sensations), and to persist in goal-directed behavior in the presence of such distress (Zvolensky,

Leyro, Berstein, & Vujanovic, 2011). Despite the widespread acknowledgement of DT as a parenting-relevant construct, no study has examined the link between DT and maternal responsiveness. This dissertation represents the first study to empirically test the association between DT and maternal responsiveness. Furthermore, although DT has been a significant variable of interest within clinical psychology, there is little evidence in support of its construct validity (Leyro, Zvolensky, and Berstein, 2010). Because of this, the present study had two general objectives: 1) to validate the construct of DT, and 2) to examine the association between DT and maternal responsiveness.

The subsequent sections provide an overview of the constructs of interest to the present study: DT and maternal responsiveness. In the first section, I highlight the significance of studying maternal responsiveness by discussing its placement within the larger theoretical framework of attachment theory. Continuing to elucidate the construct, I then address the operationalization and measurement of maternal responsiveness, followed by an overview of its consequences for child development. The second section summarizes theoretical work pertaining to the determinants of parenting behavior. In the third section, I provide a comprehensive overview of the DT construct, including various conceptualizations of DT and evidence for its construct validity. The fourth section integrates its preceding sections to provide a justification for the examination of associations between DT and maternal responsiveness. The fifth and final section of this introduction outlines the general objectives and specific aims of the proposed study.

Maternal Responsiveness: Theoretical and Empirical Significance

Maternal responsiveness refers to the extent to which a mother notices, interprets correctly, and responds promptly and appropriately to her infant's signals (Ainsworth,

Bell, & Stayton, 1971). From both a theoretical and empirical standpoint, maternal responsiveness is central to understanding child development. The theoretical significance of maternal responsiveness is grounded in attachment theory (Bowlby, 1982; Ainsworth, 1969). Following the proposal of attachment theory, a large literature evolved within developmental science that highlights the implications of maternal responsiveness for child cognitive, language, and social-emotional development (Bornstein & Tamis-LeMonda, 1989; Grolnick & Farkas, 2002). The subsequent section provide an overview of the theoretical significance of maternal responsiveness by describing its placement in the larger framework of attachment theory. Following this theoretical overview, the empirical significance of maternal responsiveness is discussed, including the operational definition of maternal responsiveness, and its consequences on child development. It is important to note that the subsequent sections refer to *maternal* responsiveness; however, attachment theory is more broadly applicable to the infant-caregiver relationship.

Theoretical Significance of Maternal Responsiveness

First proposed by John Bowlby and later tested and further elaborated by Mary Ainsworth (Bretherton, 1992), attachment theory posits that there is an evolutionary-based behavioral control system that is necessary to infant survival, termed the attachment system (Ainsworth, 1969; Bowlby, 1982). The attachment system promotes adaptive infant development by activating explorative behavior in the presence of a safe environment and proximity-seeking behavior in the presence of perceived danger (Ainsworth & Bell, 1970; Bowlby, 1973). According to this theory, maternal

responsiveness plays a critical role in the functioning and development of the attachment system.

The primary function of the attachment system is proximity seeking, which exists to protect infants from physical and psychological harm (Bowlby, 1982; Ainsworth, 1969). The attachment system achieves this goal of security by activating behaviors that promote proximity to the infant's mother. For example, the loud cries of an infant serve as a signal that he or she has a need (e.g., food, warmth, protection). Bowlby proposed that the evolutionary function of infant proximity-seeking behaviors require reciprocal behaviors from the mother. In other words, due to the vulnerability of human infants, attachment behaviors cannot not serve their protective function unless in the presence of a responsive mother.

To promote adaptive development, the attachment system is purported to continuously be balancing an infant's proximity-seeking behaviors with his or her exploration behaviors (Ainsworth & Bell, 1970). When infants do not feel threatened by their environment, they may use their mother as a secure base from which to explore the environment. However, when infants feel threatened by their environment, they may increase proximity-seeking behavior at the expense of exploration. According to attachment theory, maternal responsiveness has significant implications for how an infant balances these proximity-seeking and exploration behaviors, and research has provided empirical support for this proposition (Ainsworth & Bell; Ainsworth, 1979; Sroufe & Waters, 1977). Infants with a history of responsive maternal behaviors are able to use their mother as a secure base from which to explore the environment. This infant has learned to expect prompt, appropriate maternal responses to his or her signals and

therefore feels safe in exploring the environment. This infant knows that at any sign of threat, he or she may activate proximity-seeking behaviors to which his or her mother will respond quickly and sensitively. On the other hand, infants with a history of maternal non-responsiveness may not perceive their mother as a secure base from which to explore and/or may not perceive their mother as a source of comfort and protection from threat. Thus, maternal responsiveness promotes a smooth balance of proximity-seeking and exploration, whereas maternal non-responsiveness may lead to proximity-avoiding behavior, decreased exploration of the environment, and other maladaptive infant responses.

Bowlby (1973) further emphasized that the attachment system is comprised of cognitive components referred to as internal working models (IWM), or mental representations that infants have of themselves, their environment, and the people in it. Over time, an infant develops an IWM of his or her mother based on the mother's typical responses to infant distress. Theory and empirical work suggest that the IWM of the mother and the mother-infant relationship is used by infants to interpret future events, form relationship expectations, and form perceptions of themselves (Bretherton, 1985; Cassidy, Kirsh, Scolton, and Parke, 1996; Johnson, Dweck, and Chen, 2007; Main, Kaplan, & Cassidy, 1985). An infant with a history of responsive maternal behavior develops an IWM of his or her mother as someone who is trustworthy and as someone who will take care of the infant. For infants to know that they can cry and their mother will respond may give them a sense of control in their world (Bornstein, 2002). Thus, from the perspective of attachment theory, maternal responsiveness is critical to development because it protects infants, provides infants a secure base from which to

explore their environment, and sets a stage for the way infants view themselves and their relationships lifelong.

Operationalizing and Measuring Maternal Responsiveness

As described in the preceding section, maternal responsiveness is not a simple construct defined exclusively by maternal behaviors, but is a complex construct involving maternal behaviors that are interdependent with infant behaviors. The complexity of this construct has led researchers to operationalize maternal responsiveness in a variety of ways. It has been suggested that difficulties in operationalizing maternal responsiveness are due to the fact that responsiveness is an interpersonal behavior (Martin, 1989). Interpersonal behaviors cannot simply be understood as the actions of one person, but must also be understood as one person's behaviors in response to and in anticipation of a second person's behaviors.

Because its complexity, maternal responsiveness is comprised of a number of facets. For example, some studies have defined responsiveness by maternal affective responses to the infant (e.g., smiling; Field, Vega-Lahr, Goldstein, & Scafidi, 1987) or the extent to which maternal behaviors are intrusive vs. supportive of infant-directed behaviors (Fish & Stifter, 1995). Other studies have defined responsiveness more broadly as any maternal behavior that is contingent upon changes in infant behavior (Bornstein et al., 1992). Although studies may examine individual facets within the domain of maternal responsiveness (i.e., emotional availability, sensitivity, contingency, nonintrusiveness; see Martin), it is much more common for researchers to operationalize maternal responsiveness as a combination of these constructs (e.g., DeWitt et al., 1997; Kochanska, 1998). This approach is commonly attributed to Mary Ainsworth, and many

would agree that it is the most widely accepted definition and method of measurement for maternal responsiveness.

Ainsworth and colleagues developed a behavioral coding system to assess maternal responsiveness (Ainsworth et al., 1971). This coding system was based on a definition of maternal responsiveness that included three different dimensions. The first dimension, sensitivity-insensitivity, refers to behaviors that reflect the extent to which a mother notices, correctly interprets, and appropriately responds to infant signals. In other words, this dimension is defined by behaviors that are sensitive to and contingent upon infant cues. The second dimension is acceptance-rejection and pertains to maternal affect displayed toward the infant. The acceptance-rejection dimension defines maternal responsiveness as the ability to display positive emotions toward the infant despite the negative emotions that may be experienced in response to the infant and despite limitations the infant places on the mother's competing activities. Finally, the third dimension of maternal responsiveness based on Ainsworth's method is cooperation-interference. This dimension refers to the mother's ability to respect her infant as an individual and not exert unnecessary control over the infant. In other words, this dimension defines maternal responsiveness as the extent to which a mother imposes her own initiative on the infant instead of allowing infant-directed activity whenever appropriate (i.e., when infant is not in danger).

Although it is common for studies to operationalize maternal responsiveness more broadly, research has demonstrated that domains of maternal responsiveness, or context-specific responsiveness, may be uniquely associated with different child outcomes. For example, research has identified sensitivity to infant distress and sensitivity to non-

distress as distinct domains of responsiveness in young infants (Leerkes, Weaver, & O'Brien, 2012). These studies have demonstrated that sensitivity to infant distress is associated with child attachment and social-emotional adjustment (Leerkes, Blankson, & O'Brien, 2009; McElwain & Booth-LaForce, 2006), whereas sensitivity to non-distress (e.g., play, exploration, non-distress vocalizations) is associated with language ability, attention span, and symbolic play (Bornstein & Tamis-LeMonda, 1997; Tamis-LeMonda, Bornstein, Baumwell, & Damast, 1996). Although this line of research emphasizes the utility of studying specific domains of maternal responsiveness, it also highlights the importance of general maternal responsiveness to promoting adaptive child outcomes across developmental domains. Thus, the present study operationalized maternal responsiveness more broadly to capture sensitivity to both infant distress and non-distress given the importance of both categories to child development. Furthermore, this study included multidimensional assessment of responsiveness rather than focusing specifically on the dimension of sensitivity. Although previous work has emphasized the importance of maternal contingent responding to cues of young infants (i.e., sensitivity; Bigelow et al., 2010; Newnham, Milgrom, & Skouteris, 2009), other work has operationalized responsiveness more broadly to also include dimensions related to acceptance-rejection (e.g., positive affect) and cooperation-interference (e.g., intrusiveness) in this age group (Pauli-Pott, Mertesacker, Bade, Bauer, Beckmann; 2000; Wakschlag & Hans, 1999).

The Ainsworth method of measuring maternal responsiveness has been adapted by a number of (e.g., Biringen, Robinson, & Emde, 2000; Clark, Hyde, Essex, & Klein, 1997). These assessments of maternal responsiveness have demonstrated significant associations with theoretically related constructs (e.g., attachment security; Ainsworth et

al., 1971; Kochanska & Coy, 2002). And, as will be discussed, researchers have used these assessments of maternal responsiveness to predict critical outcomes in the domain of child development.

Consequences of Maternal Responsiveness

In addition to its central position in an empirically supported theoretical framework, maternal responsiveness has been implicated in a wide range of child outcomes including cognitive, language, and social-emotional development. A number of studies have demonstrated that maternal responsiveness is associated with child cognitive and language development both concurrently and longitudinally (Paavola, Kunnari, & Moilanen, 2005; Bornstein & Tamis-LeMonda, 1997; Milgrom, Westley, & Gemmill, 2004; Stanley, Murray, & Stein, 2004; Evans et al., 2010). For example, Tamis-LeMonda, Bornstein, and Baumwell (2001) collected biweekly data on child language acquisition from ages 9-21 months and found that maternal responsiveness at ages 9 and 13 months predicted timing of child attainment of language. Another study assessed maternal responsiveness at ages 6, 12, 24, 36, and 48 months and categorized mothers in groups depending on their magnitude and consistency of responsiveness at these time points (Landry, Smith, Swank, Assel, & Vellet, 2001). Results demonstrated that the combination of consistent and high levels of maternal responsiveness was associated with a faster rate of cognitive development than were inconsistent or low levels of maternal responsiveness.

A very large body of work has demonstrated that maternal responsiveness during infancy is also associated with child social-emotional development including prosocial behavior, social problem solving, expressivity, and externalizing behaviors (Dix, Cheng,

& Day, 2009; Goldberg, Lojkasek, Gartner, & Corter, 1989; Kochanska, Forman, & Coy, 1999; Nicely, Tamis-LeMonda, & Grolnick, 1999; Shaw et al., 1998; Wakschlag & Hans, 1999). In a sample of 235 mother-child dyads, Spinrad et al. (2012) demonstrated through structural equation modeling that maternal responsiveness at age 30 months predicted child effortful control at age 42 months. A small number of studies also have shown that maternal responsiveness may serve as a buffer to maladaptive outcomes. For example, Doan and Evans (2011) showed that the effects of child chronic stress on working memory were moderated by maternal responsiveness such that the effect was significantly reduced in children with responsive mothers.

A strong body of evidence has identified maternal responsiveness as a critical factor in child development. However, there is relatively little research examining specific processes that underlie responsive parenting in mothers. The next section will provide a summary of parenting models that have been used to identify risk factors for dysfunctional parenting. In particular, an emotion-based model of parenting will be highlighted along with empirical evidence supporting the study of emotion-related processes, including DT.

Determinants of Maternal Responsiveness

Belsky's Multiple Determinants of Parenting

Perhaps the most widely cited theory of parenting behavior is the process model proposed by Belsky (1984). His model posits that parenting behavior is multiply determined by a combination of parental characteristics (e.g., psychopathology), child characteristics (e.g., temperament), and contextual characteristics (e.g., marital relationship, employment satisfaction). Belsky's theory prompted a large body of

research providing empirical support for the role of these three factors and interactions among these factors in influencing parenting behavior (Belsky & Jaffee, 2006; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; McCabe, 2014; Prinzie, Stams, Dekovic, Reijntjes, & Belsky, 2009; Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). For the most part, this body of research has identified populations at risk for dysfunctional parenting, including depressed mothers, families in poverty, parents in marital conflict, and parents of children with conduct disorder (Downey & Coyne, 1990; Cummings & Davies, 1994; McLoyd, 1998; Erel & Burman, 1995; Krishnakumar & Buehler, 2000; Evans, 2004; Kaiser & Delaney, 1996).

Although the identification of groups at risk for compromised parenting has significant implications for intervention (Nylen, Moran, Franklin, & O'Hara, 2006; Clark, Tulczek, & Brown, 2008; Gardner, Burton, & Klimes, 2006; Gershater-Molko, Lutzker, & Wesch, 2003), developmentalists argue for an increased focus on research that identifies specific parenting processes that may contribute to maladaptive parenting (Teti & Cole, 2011). In other words, moving beyond the identification of at-risk groups, what are the specific parenting processes that are common across these groups? Answering this question is critical to improving the sensitivity and specificity of interventions for parents.

Dix's Affective Organization of Parenting

Emotion and emotion-related processes as determinants of parental behavior have received an increasing amount of attention (Teti & Cole, 2011). This increased attention is due to the heavy emphasis of parental emotion regulation in both parenting theory (Cassidy, Jones & Shaver, 2013; Dix, 1991) and intervention (Greenberg; 2002; Shapiro,

Nahm, Gottman & Content, 2011). Dix's theory of the affective organization of parenting, in particular, has guided much of the research pertaining to emotion and parenting.

In his theory of parenting behavior, Dix (1991) proposed a three-component model of parenting in which parental emotion is the central construct. The three components of this model are emotion activation, engagement, and regulation. Dix proposed that parents are constantly evaluating whether interactions with their children are consistent with their goals and plans. Because parental goals are often dependent upon child behavior, parent-child interactions are certain to evoke emotions in parents (emotion activation). The parental emotion that is activated in response to a child's behavior depends upon whether the child's behavior is consistent or inconsistent with the parent's goal. This activated emotion organizes various processes that are used by the parent to respond to the child (emotional engagement), including communication, attention, and motivation. For example, a mother who experiences anxiety in response to her child's behavior may be intrusive or withdrawn in an attempt to get her child's behavior realigned with her parental goals. In contrast, a mother who experiences joy in response to her child's behavior may be attentive to the child and seek opportunities to engage with the child. Although a given emotion may prime parents to behave in a certain way, parents may manage the experience of that emotion and control what they communicate to their child (emotion regulation).

Dix emphasized that the influence of emotions on parenting is dependent upon the parents' ability to understand and control their own emotions. This focus on parental regulation of emotions as central to understanding dysfunctional parenting has been

mirrored by other prominent members of the field (Cassidy et al., 2013; Teti & Cole, 2011). However, emotion regulation is a complex, multifaceted construct and there are a variety of facets that are likely important to study in the context of maternal responsiveness.

Distress tolerance, a hypothesized facet of emotion regulation (Leyro et al., 2010), has been identified by many parenting researchers as a promising candidate for study. For example, some authors have proposed that the reason unresponsiveness is prominent among depressed mothers is because the symptoms associated with depression are accompanied by a reduced tolerance for aversive stimulation (Cummings & Davies, 1994; Downey & Coyne, 1990; Lahey, Conger, Atkesone, & Treiber, 1984; Dix & Meunier, 2009). Similarly, authors have suggested that DT may explain the overprotective and intrusive parenting of anxious children (Tiwari et al., 2008) and the failure of parenting interventions in the presence of maternal psychopathology (Ben-Porath, 2010). Authors have further emphasized the potential benefit of incorporating DT skills into parent training for both at-risk and normal-functioning parents (Ben-Porath; Russell & Fechter-Leggett, 2012). Thus, there is a strong theoretical basis for the hypothesis that DT is associated with maternal responsiveness. And despite numerous speculations regarding the importance of DT to understanding maternal behavior, there has not yet been an empirical investigation of this construct in the context of parenting.

Distress Tolerance

In broad definition, DT refers to one's capacity to withstand internal distress and to persist in goal-directed behavior in the presence of such distress (Leyro et al., 2010). It is important to note that he construct of DT is concerned with an individual's subjective

experience of aversive experiential states and not with an individual's ability to manage external stressors. The type of this internal distress varies across different operational definitions of DT and includes cognitive, emotional, and physical distress (Zvolensky et al., 2011). Some examples would include distress about thoughts toward an uncertain future, feelings of sadness, and sensations of pain. Because of these individual differences related to the tolerability of aversive internal experiences, individuals who are low in DT are expected to respond to current distress with negativity and avoidance, and to escape and avoid future situations that may engender distress. Thus, DT may be viewed as integral to many processes involved in emotion regulation (Simons & Gaher, 2005; Leyro et al.); it is important, however, to distinguish the two.

A variety of DT constructs have been conceptualized, each focusing on a unique type of internal distress, including distress related to ambiguity, uncertainty, physical sensations, negative emotions, and frustration. Each unique DT construct is used in the study of different psychopathologies (e.g., intolerance of uncertainty and generalized anxiety disorder; Gentes & Ruscio, 2011). Distress tolerance has been a widely studied construct due to its significant role in a number of behavioral psychotherapy treatments (e.g., Hayes, Strosahl & Wilson, 2012; Linehan, 1993), and its purported role in the development and maintenance of psychopathology (Leyro et al., 2010). Despite this popularity, DT is not yet a well validated construct. A number of authors have highlighted the fact that very few studies have attempted to integrate the wide range of DT research, thereby limiting our ability to determine how various DT constructs are related to one another (Leyro et al.; McHugh & Otto, 2012; Zvolensky et al., 2011). The

subsequent sections will provide an overview of how DT is conceptualized, the various operational definitions of DT, and the evidence for a construct of DT.

Conceptualization of DT

A critical distinction pertaining to the conceptualization of DT is the difference between the perceived capacity to tolerate distress and the behavioral capacity to tolerate distress. Perceived DT is assessed via self-report instruments and behavioral DT is assessed by determining the amount of time an individual is able to persist at a distressing task (e.g., cold-pressor task; serial-addition task; Leyro et al., 2010). Self-report and behavioral measures of DT have often been described as providing a multi-method assessment of DT; however, these two methodologies are actually assessing different constructs. Indeed, the current literature shows that perceived DT and behavioral DT are not only conceptually distinct constructs, but also quantitatively distinct (McHugh et al., 2011; Schloss & Haaga, 2011). Although both perceived DT and behavioral DT have been studied in the development and maintenance of psychopathology, many psychotherapy models frame DT skills as the perceived capacity to withstand unwanted thoughts, feelings, and sensations (e.g., Acceptance and Commitment Therapy; Hayes et al., 2012). Furthermore, research has suggested that self-reported DT is associated with mood and anxiety disorder diagnoses, whereas behavioral DT is not (Bernstein, Marshall, & Zvolensky, 2011).

Because DT is involved in multiple aspects of emotion regulation, it is important to distinguish it from this conceptually related construct. Emotion regulation is a complex phenomenon that has been described as emotional responding characterized by the understanding of emotional states, reactivity to emotional states, and management of

emotional responses (Mennin, Holaway, Fresco, Moore & Heimberg, 2007; Thompson, 1994). Based on this account of emotion regulation, some authors have suggested that DT is a narrower construct than emotion regulation and that it is related to many affect-regulatory processes (Leyro et al., 2010; Simons & Gaher, 2005). Research has provided quantitative support for a distinction between DT and emotion regulation (McHugh, Reynolds, Leyro & Otto, 2013; Simons & Gaher); however, there does not appear to be a study that examines the latent structure of these constructs to support theories that DT is a facet of emotion regulation. The fuzzy conceptual distinction between DT and emotion regulation processes are not the only challenges facing empirical investigations of DT; indeed, the variety of ways in which the construct is defined also poses a problem for this area of study.

Operational Definitions of Distress Tolerance

One of the earliest proposed DT constructs is tolerance of ambiguity (TOA; Frenkel-Brunswik, 1949). This construct is commonly defined as the extent to which an individual perceives ambiguous stimuli as threatening or desirable (Budner, 1962; Norton, 1975). For example, a person who is low in TOA is likely to feel uncomfortable and avoidant of situations that present vague, incomplete, and/or contradictory information (Budner). Although often used interchangeably, TOA is conceptually distinct from the DT construct known as intolerance of uncertainty (IU). The IU construct is defined as the extent to which an individual perceives it to be unacceptable for a negative event to occur, regardless of the likelihood of that negative outcome (Dugas, Gosselin, Ladouceur, 2001). Because of this, a person who is high in IU will likely perceive ambiguous information as threatening. However, IU is distinct from

TOA. IU pertains to future-oriented situations; TOA pertains to present-moment situations (Grenier, Barrette, & Ladouceur, 2005). In other words, individuals who are high in IU perceive the future as a source of distress, but people low in TOA perceive the current situation as a source of distress. Tolerance of ambiguity and uncertainty have traditionally been studied in the context of anxiety disorders (Carleton, 2012; Gentes & Ruscio, 2011). However, Grenier et al. have argued that TOA and IU have too often been used interchangeably and that future work should distinguish between these two constructs and how they influence psychopathology.

Another DT construct that has been proposed in the literature is defined as an individual's tolerance for negative emotions (TNE). According to Simons and Gaher (2005), a person who has low TNE is likely to perceive negative emotions as unbearable and unacceptable. These individuals are also likely to put high effort into avoiding/reducing their negative emotions and become absorbed by their negative emotions when alleviating them is unsuccessful. The TNE construct is most commonly studied in the context of substance use (Leyro, Bernstein, Vujanovic, McLeish & Zvolensky, 2011; Simons & Gaher). However, few studies have identified associations between TNE and symptoms of depression and eating disorders (Anestis, Selby, Fink & Joiner, 2007; O'Cleirigh, Ironson, and Smits (2007).

The construct of frustration discomfort (FD) focuses on feelings of frustration or obstruction of goals as an individual's source of distress. This DT construct was developed based on principles from rational-emotive behavior therapy (Ellis, 1979, 1980). Specifically, FD refers to dysfunctional or irrational belief processes related to the intolerance of uncomfortable emotions, effort, unfairness, hassles, and achievement

(Harrington, 2005a). There has been relatively less research pertaining to the role of FD in the etiology of psychopathology. A limited number of studies suggest that FD is associated with symptoms of depression, anxiety, and self-harm (Harrington, 2005b; Harrington, 2006).

In contrast to the previously discussed DT constructs where the source of distress pertained to cognitive or emotional experience, discomfort intolerance (DI) identifies physical sensations as the source of distress. The DI construct is conceptualized as similar to the construct of pain tolerance (Marlowe, 1992) such that some individuals are expected to have a higher tolerance for physical discomfort than others (Schmidt, Richey & Fitzpatrick, 2006). The construct of DI has informed the study of anxiety symptoms, particularly studies of panic disorder (Schmidt et al., 2006; Schmidt, Richey, Cromer & Buckner, 2007). Further, DI has demonstrated specificity to symptoms of anxiety, but not depression (Schmidt et al., 2006).

Evidence for a Construct of Distress Tolerance

Convergent validity. In their seminal article, Campbell and Fiske (1959) emphasized the importance of demonstrating the validity of constructs by examining the convergence between two independent measures of the same construct. Given that current behavioral assessments of DT do not provide evidence of convergent validation (McHugh et al., 2011; Schloss & Haaga, 2011), alternative methods must be used to validate self-ratings of DT. A search of the literature revealed no study that utilized a combination of measurement methods to provide strong evidence for the convergent validity of DT. Because DT is conceptualized as a stable, trait-like construct, studies of the convergent validity of other trait-like constructs may be informative.

In the personality literature, peer ratings are often used as a way to demonstrate convergent validity of self-report ratings (Connolly, Kavanagh, & Viswesvaran, 2007). Research has shown that a number of factors influence the degree to which self- and other-ratings converge, including trait visibility, number of other reporters, and length of acquaintance (Watson & Clark, 1991; Watson, Hubbard, & Wiese, 2000). For example, self- and other-ratings demonstrate higher convergent validity when measures are of more visible traits (e.g., extraversion), when ratings from multiple informants are used, and with increased length of acquaintance (Biesanz, West, & Millevoi, 2007; Kolar, Funder, & Colvin, 1996; Ready, Clark, Watson, & Westerhouse, 2000). Based on items from current self-report measures of DT (discussed in the preceding sections), DT appears to be a low-visibility trait. Thus, the use of multiple informants and/or informants who are closely acquainted with the subject may provide a viable method for convergent validation of DT self-ratings.

Factorial validity. As the preceding sections summarized, there is a large body of research pertaining to DT. A significant limitation in the area of DT research is that there are few studies that have attempted to integrate the various conceptualizations of DT into a single model. In other words, there is little empirical work in support of DT's construct validity. For example, a study by McHugh et al. (2011) found that the DT construct of DI demonstrated only a small association with the construct of TNE (r=-.25). Similar results were obtained by Bernstein, Zvolensky, Vujanovic, and Moos (2009) who found that that DI was not significantly associated with TNE (r=-.12). Bernstein and colleagues conducted further analyses to examine the latent structure of DT and found that TNE and anxiety sensitivity (a construct conceptually related to DT) were lower-

order facets of a single latent factor, whereas DI appeared to be distinct. These results support a hierarchical model represented by a global DT construct and distinct but related lower order dimensions. In contrast, a second study of the latent structure of DT demonstrated that a single latent factor best explained the covariance among a variety of DT measures, including DI (McHugh & Otto, 2012).

Although results from the two structural studies of DT represent a step forward, there are a number of limitations. First, both of these studies included anxiety sensitivity as an indicator of DT; however, these two constructs are conceptualized by DT researchers as theoretically distinct constructs (Leyro et al., 2010). Indeed, McHugh and Otto's (2012) analyses showed that only one item from the Anxiety Sensitivity Index demonstrated a large correlation with the latent DT factor. Next, these two studies did not include all proposed DT constructs in their structural analyses. In particular, they did not include measures of cognitive DT (i.e., tolerance of ambiguity, intolerance of uncertainty). Because of this exclusion of cognitive DT measures, previous structural studies are also limited because they could not test and compare competing models of DT. For example, do all of the DT conceptualizations, including cognitive DT, represent a single latent DT construct? Or is the construct of DT multidimensional such that cognitive DT, emotional DT, and physical DT are distinct but related DT constructs? These are empirical questions that have yet to be answered by the literature.

Distress Tolerance and Parenting

Returning to Dix's (1991) three-component model of parenting, emotion affects parents' behaviors based on the way that parents understand and manage their emotions and responses. Furthermore, researchers have speculated that DT is critical to

understanding dysfunctional parenting (e.g., Ben-Porath, 2010; Russell & Fechter-Leggett, 2012; Tiwari et al., 2008). Given the comprehensive account of DT as presented in the previous section, it may be expected that DT would influence maternal responsiveness in a variety of ways. First, individuals who are low in DT are likely to engage in behaviors that allow them to avoid situations that are expected to cause distress (Linehan, 1993; McHugh et al., 2013; Simons & Gaher, 2005). Further, the tendency for individuals to avoid distress and view it as unacceptable may lead to increases in the perceived intensity and/or aversiveness of unwanted emotions. In other words, DT is associated with avoidant behaviors and negative affectivity, both of which have been studied in the context of parenting.

Avoidant coping strategies are negatively associated with sensitive parenting. Gudmundson and Leerkes (2012) demonstrated that maternal reports of disengaged coping (i.e., attempts to avoid or minimize stressors and negative affect) were associated with self-reported responses to toddlers' negative emotions. More specifically, an increased level of disengaged coping was associated with increased endorsement of punitive and/or distressed responses to toddlers' negative emotions. Furthermore, mothers who are identified as dismissive-avoidant have shown to be less responsive caregivers (van IJzendoorn, 1995). According to the adult attachment literature, dismissive-avoidance is characterized by avoidance of distress by diverting attention from attachment-related experiences (e.g., cuddling with infant; Fraley, Davis & Shaver, 1998), providing further evidence that avoidant-style coping strategies are associated with maladaptive parenting behaviors.

A number of studies have examined the association between emotional reactivity and parenting behavior. In particular, research has demonstrated that mothers who experience increased intensity of negative affect when interacting with their children are less likely to engage in optimal parenting (Leerkes, 2010; Lorber & O'Leary, 2005; Lorber & Smith Slep, 2005; Smith & O'Leary, 1995). In a study of 119 pregnant women, Leerkes, Parade and Gudmundson (2011) asked women to rate the intensity of their emotional response to videos of infants crying. Findings from this study demonstrated that intensity of prenatal anger and anxiety in response to infant cries was associated with an increase in self-reported punitive, minimizing, and distress responses to infant negative affect at 16-months postpartum.

Studies in this area have also provided physiological data to support a link between emotional reactivity and compromised parenting behavior. For example, Frodi and Lamb (1980) showed that abusive parents responded to infant crying with significantly higher heart rate and skin conductance than did non-abusive parents. These findings have been replicated using a wide range of stressful child- and non-child related stimuli in both parents and childless adults (for reviews see McCanne & Hagstrom, 1996; Milner & Chilamkurti, 1991). Another study by Out, Bakersman-Kranenburg, Van Pelt, and van IJzendoorn (2012) found that adults who endorsed harsh parenting intentions in response to infant cries were less likely to demonstrate a decreased physiological response compared to adults who did not endorse harsh parenting intentions. In other words, adults who indicated that they would engage in harsh parenting in response to infant cries did not habituate to repeated cries; whereas adults who did not endorse harsh parenting intentions showed a heightened physiological response to initial cries but a

decreased response with repeated exposure (Out et al., 2012). Taken together, these physiological data suggest that, although infant cries evoke a physiological stress response in adults, some adults demonstrate a heightened sensitivity to stress and some adults are less able to modulate that stress response, both of which result in poor parenting practices. Given the association between avoidant behaviors, negative affectivity, and DT, these studies provide indirect support for an association between DT and maternal responsiveness.

In addition to a strong theoretical basis and indirect empirical support for DT as a parenting-relevant construct, it is also an ideal candidate from an intervention perspective. A large literature has demonstrated the efficacy of existing parenting interventions to improve outcomes including maternal responsiveness and child behavior (Lundahl, Risser, & Lovejoy, 2006; Menting, de Castro, & Matthys, 2013; Owen, Slep, & Heyman, 2012; Troutman, 2015; van IJzendoorn, Juffer, & Duyvesteyn, 1995). Studies have also demonstrated that a number of risk factors, including parental psychopathology, may interfere with the effectiveness of interventions for parents and children (Ben-Porath, 2010; Griest, Forehand, & Wells, 1981; Kazdin, 1987; Webster-Stratton & Hammond, 1990). Researchers have identified ways to enhance existing parenting interventions for at-risk groups (e.g., Sanders et al., 2004). Addressing an individual process such as DT that is common across different psychopathologies and risk conditions can inform the refinement of existing interventions to be more broadly applicable across at-risk groups.

Another reason DT is an ideal parenting-relevant construct from an intervention perspective is because it is a common treatment target. Unlike a number of variables that

have been identified as predictors of responsive parenting (e.g., maternal history of child maltreatment; poverty; Berlin, Appleyard & Dodge, 2011; Evans, 2004), DT is a manipulable variable that lends itself nicely as a target for intervention. Indeed, a number of empirically support treatments emphasize DT-related skills as an element of treatment. For example, Dialectical Behavior Therapy (Linehan, 1993) has an entire module dedicated to DT skills such as accepting situations for what they are, self-soothing through the five senses, and distracting oneself. Acceptance and Commitment Therapy (Hayes et al., 2012) also has DT-related foci that help individuals distance themselves from unhelpful thoughts such as "I can't tolerate this emotion" (i.e., defusion), and that encourage individuals to engage in goal-directed behavior despite unwanted emotions (i.e., committed action). These interventions and other interventions that emphasize DT-related skills have demonstrated efficacy in treating a wide range of psychological struggles (Dimeff & Koerner, 2007; Ost, 2008; Ruiz, 2010). Thus, empirical support for the role of DT in the parenting process would have significant implications for intervention.

Summary and Objectives

Considered as a whole, the preceding sections provide theoretical and empirical support for the importance of DT to the study of parenting behavior. Furthermore, the literature would suggest that DT is not yet a well validated construct. Thus, the present study consisted of two primary objectives. First, the construct of DT was validated using a sample of pregnant women and informant reports of DT. Second, the extent to which DT is associated with maternal responsiveness was examined. To achieve these primary objectives, I pursued the following specific aims:

Specific Aim 1- Examine the Latent Structure of DT

To achieve this aim, I utilized self-report measures of the five DT constructs that have been proposed in the literature. Consistent with the integrated model of DT as proposed by Zvolensky, Vujanovic, Bernstein, and Leyro (2010), data from these measures were analyzed as indicators of a single latent DT construct (see figure B1). This one-factor model was compared to an alternative model that reflects the alternative theory that DT is a higher-order construct comprising domain-specific dimensions (see figure B2). Because the limited work in this area has demonstrated conflicted findings, I had no specific predictions regarding this aim.

Specific Aim 2- Examine the Convergent Validity of DT Self-ratings

Informant reports of DT were included to enhance the validity of self-ratings. Based on previous research regarding the convergence of self-reports and highly-acquainted peer-reports of trait-like constructs, I hypothesized that informant reports of DT would demonstrate moderate to large associations with self-reported DT.

Specific Aim 3- Examine the Longitudinal Association between DT and Maternal Responsiveness

Using the best supported model of DT from Specific Aim 1, a prenatal DT score was estimated for each participant. I expected that a woman's perceived tolerance for subjective distress as assessed during pregnancy would influence responsiveness at 4-months postpartum. To assess the unique variance in maternal responsiveness that is accounted for by DT, a number of covariates were considered, including demographic variables and DT-related variables.

Specific Aim 4- Examine the Concurrent Association between DT and Maternal Responsiveness

Similar to expectations of results from Specific Aim 3, I hypothesized that a woman's current perceptions of her ability to tolerate distress would influence the extent to which she responds promptly and appropriately to her infant's signals.

CHAPTER TWO: RESEARCH DESIGN AND METHOD

Participants

The present study consisted of a primary sample and a secondary sample of pregnant women. The primary sample included women who were eligible to participate in the postpartum assessments, whereas the secondary sample included women who were only eligible to participate in the prenatal assessment. To be eligible for participation in the proposed study, women had to be at least 18 years of age, in their third trimester of a singleton pregnancy, and be proficient in the English language. Additional criteria for inclusion in the primary sample required that women intended to have their infants living with them following birth, that they lived within 15 miles of the University of Iowa Hospitals and Clinics (UIHC), and that they had due dates before August 15, 2014. Women who did not meet these additional criteria were included in the secondary sample.

Procedures

Recruitment

All study procedures were approved by the University of Iowa Institutional Review Board. Recruitment took place between October 2013 and October 2014. Based on information available in the electronic medical record database used by UIHC, the Institute for Clinical and Translational Science provided contact information for all pregnant patients during the study period. Women were then identified as eligible for either the primary sample or the secondary sample based on their proximity to UIHC and expected due date. The flowchart depicted in figure B3 provides an overview of the recruitment process. Women eligible for the primary sample were sent letters in the mail

introducing them to the study and were offered the opportunity to return a decline postcard if they were not interested in being contacted by the research team. All women who did not return a decline postcard were contacted via telephone and offered participation. During this phone call, criteria for inclusion in the primary sample were confirmed. Women who were not eligible for the primary sample based on proximity to UIHC and expected due date were sent letters in the mail introducing them to the study and providing a link to the study's online survey. No additional contact was made with women who were not eligible for the primary sample.

Study Assessments

Participants in the primary sample completed three separate assessments: a prenatal survey, a postpartum visit, and a postpartum survey. Participants in the secondary sample completed only the prenatal survey. The surveys were completed online. During the prenatal assessment, participants in the primary sample were asked to provide contact information for up to three potential informants. Potential informants were contacted one at a time until one of them completed a brief online survey.

Six to eight weeks following a participant's expected due date, she was contacted to confirm: 1) that the pregnancy resulted in a live birth, 2) the actual date of birth, 3) that the infant was living with her, and 4) that she was interested in continuing with the study. At approximately four months postpartum, participants completed the postpartum visit, which involved an in-home observation of maternal responsiveness. A team of research assistants went to each participant's home and video recorded mother-infant interactions in a variety of situations (see *Maternal Responsiveness* below). In total, participants in the primary sample received up to $70 for completion of all study assessments,

participants in the secondary sample received $10 for completion of the prenatal survey, and informants received $10 for completion of the online survey.

Measures

Self-Report Assessments

Tolerance of ambiguity (TOA). The Multiple Stimulus Types Ambiguity Tolerance Scale-II (McLain, 2009) is a 13-item self-report scale that was developed to address issues of low reliability in previous TOA measures. In the original validation study, a factor analysis supported a single factor model in which all 13 items represent general TOA. Response options range from 1 (strongly disagree) to 5 (strongly agree) with lower overall scores indicating greater aversion to ambiguity and higher overall scores indicating greater attraction to ambiguity. In other words, higher scores on the MSTAT-II suggest higher levels of DT. This instrument's factor structure and internal consistency (α=.79-.83) have been supported, and researchers have recommended the MSTAT-II over other measures of TOA (Bors et al., 2010).

Intolerance of uncertainty (IU). The Intolerance of Uncertainty Scale- Short Form (IUS-12; Carleton, Norton, & Asmundson, 2007) was used as a measure of participants' perceptions of their own IU. This instrument contains 12 items rated on a scale from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). In the IUS-12 original validation study, a two-factor solution best fit the data. These two factors have demonstrated acceptable internal consistency and have been labeled Prospective Anxiety (α=.85) and Inhibitory Anxiety (α=.85). The Prospective Anxiety subscale captures the anxious component of IUS ("Unforeseen events upset me greatly")

whereas the Inhibitory Anxiety subscale represents the avoidance piece of IUS ("When I am uncertain I can't function very well").

Tolerance of negative emotions (TNE). Participants' perceived ability to withstand negative emotions was assessed by the Distress Tolerance Scale (DTS; Simons & Gaher, 2005). The DTS is a 15-item instrument that asks participants to rate their beliefs about feeling distress on a scale from 1 (strongly disagree) to 5 (strongly agree). In addition to the original validation study of the DTS, other studies have provided support for the factor structure and psychometric properties of this instrument (e.g., Leyro et al., 2011). Data from these studies provided support for a hierarchical multidimensional model such that the DTS is best represented by a higher-order DT factor and four lower-order facets represented by the subscales Tolerance, Appraisal, Absorption, and Regulation. The Tolerance subscale assesses the extent to which an individual perceives distress as unbearable. The Appraisal subscale captures an individual's lack of acceptance of distress. The Absorption subscale measures disruption of functioning due to distress and the Regulation subscale measures escape and avoidance of distress. Acceptable internal consistencies have been demonstrated for each facet (α's=.66-.85) as well as for the higher-order factor (α=.91). These previous studies have also demonstrated the test-retest reliability of the DTS (ICC=.61).

Frustration discomfort (FD). The Frustration Discomfort Scale (FDS; Harrington, 2005a) was used to assess participants' perceived intolerance for unfairness, hassles, and task-related failure. The FDS contains 28 items asking participants to rate how strongly a set of statements describes their own beliefs. Items are rated on a scale from 1 (absent) to 5 (very strong). Studies of the validity of the FDS have provided

support for a four-factor solution and incudes the subscales of Discomfort Intolerance, Entitlement, Emotional Intolerance, and Achievement (Harrington, 2005a; Harrington, 2005b). Whereas the Emotional Intolerance subscale represents general intolerance of distressing emotions ("I can't bear disturbing feelings"), the other three subscales capture frustration related to specific scenarios. The Discomfort Intolerance subscale assesses the extent to which an individual is bothered by hassles ("I can't stand having to persist at unpleasant tasks"). The Entitlement subscale includes items that capture an individual's intolerance for unfairness ("I can't stand having to change when others are at fault"). The Achievement subscale assesses an individual's task-related frustration ("I can't stand doing a job if I'm unable to do it well"). In these previous studies, the four subscales have demonstrated acceptable internal consistency (α's=.84-.88).

Discomfort intolerance (DI). Participants' perceived tolerance for physical discomfort was assessed by the Discomfort Intolerance Scale (DIS; Schmidt et al., 2006). The DIS is a five item self-report instrument with response options ranging from 0 (not at all like me) to 6 (extremely like me). The original validation study of this instrument found a two-factor solution fit the data best. These two factors are represented by the subscales Discomfort Intolerance and Discomfort Avoidance. Both factors have demonstrated acceptable internal consistency (α's=.91, .72) and test-retest reliability (*r*'s=.63, .66).

Coping style. The extent to which participants engage in avoidant and active/problem-focused coping was assessed using the COPE Inventory (Carver, Scheier, & Weintraub, 1989). Participants are asked to read 60 statements that describe different responses to stress and rate the extent to which they usually engage in each of these

responses when confronted with stressful events. Ratings may range from 1 (I usually don't do this at all) to 4 (I usually do this a lot).

The 60 items of the COPE provide an assessment of 15 different coping responses (four items per coping response). Although these 15 scales were designed to assess individual coping responses, previous research has used aggregates of a subset of these scales to examine broader categories of coping (e.g., avoidant coping and active coping; Berghuis & Stanton, 2002). The present study utilized an aggregate of three COPE scales, denial, behavioral disengagement, and mental disengagement to assess avoidant coping. Thus, avoidant coping included items such as "I act as though it hasn't happened," "I just give up trying to reach my goal," and "I daydream about things other than this. Active coping was assessed using an aggregate of two COPE scales, active coping and planning." The active coping aggregate included items such as "I concentrate my efforts on doing something about it" and "I try to come up with a strategy about what to do." As demonstrated in previous research, the avoidant coping scale and the active coping scale have shown acceptable internal consistency (α's=.71-.95; Berghuis & Stanton).

Negative Affectivity. A participant's tendency to experience frequent and intense negative affect was assessed by the Neuroticism subscale of the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The NEO-FFI represents a short form of the revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae). The NEO-PI-R is a 240 item instrument that assesses five personality traits: neuroticism, extraversion, openness, conscientiousness, and agreeableness. From the NEO-PI-R, 12 items for each trait were selected based on the items' factor loadings on their respective traits. This

selection process resulted in the 60 items that compose the NEO-FFI. This instrument asks participants to read a set of statements and rate how well each statement describes them on a scale from 0 (strongly disagree) to neutral (2) to strongly agree (4). Individuals who score high on the trait of neuroticism tend to strongly endorse items such as "I often feel tense and jittery" and "When I'm under a great deal of stress, sometimes I feel like I'm going to pieces." Previous research has demonstrated that this short form has acceptable internal consistency (α=.84-.85) and test-retest reliability (*r*=.89; Robins et al., 2001).

Stress. Life stress was assessed by the questionnaire version of the List of Threatening Experiences (LTE-Q; Brugha & Cragg, 1990) and the Parenting Stress Index, Short Form (PSI-SF; Abidin, 1995). On the LTE-Q, participants are asked to read a list of 12 life events and indicate the number of times each event has happened to them in the most recent 3- or 6-month period. The LTE-Q has demonstrated satisfactory convergent validity with a life events interview for a 3-month timeframe (kappa=.83) and a 6-month timeframe (Kappa=.63).

The PSI-SF is a 36-item survey that assesses levels of parenting stress. Participants are asked to rate each item while considering a particular child (e.g., your new infant) on a scale from "strongly agree (1) to "not sure" (3) to "strongly disagree" (5). A factor analysis of this scale supported a 2-factor model with parental distress and dysfunctional parent-child interactions (i.e., childrearing stress) as two distinct, but highly correlated indicators of parenting stress (Haskett, Ahern, Ward & Allaire, 2006). The parental distress factor is represented by items such as "I feel trapped by my responsibilities as a parent" and "Since having this child, I feel that I am almost never

able to do things that I like to do." The childrearing stress factor is represented by items such as "I feel that my child is moody and easily upset" and "Sometimes I feel like my child doesn't like me and doesn't want to be close to me." The two factors of the PSI-SF have demonstrated acceptable internal consistency (α's=.78, .91) and test-retest reliability (*r*'s=.61, .75; Haskett et al., 2006).

Informant Assessments

Informant ratings of DT were obtained from close acquaintances as identified by the participant. When identifying potential informants, participants were asked to report their relationship and length of acquaintanceship with the informant. The items and instructions for the MSTAT-II, IUS-12, DTS, FDS, and DIS were reworded to facilitate completion of the measures by an informant.

Observational Assessments

Behavioral assessments of maternal responsiveness were conducted based on procedures and coding methods used in previous work by Kochanska and colleagues (e.g., Kochanska, 1998; Kochanska & Aksan, 2004). During postpartum visits, participants were asked to interact with their infants as they normally would while performing a variety of tasks (see Table A1). Tasks were chosen to represent a range of item difficulty, including easy, moderate, and difficult tasks. Tasks representing easy items including activities that did not require the mother to split her attention between her infant and another task (e.g., play scene, mobile scene). One task represented an item of moderate difficulty and required that the mother complete an infant-focused tasks (i.e., bath and caregiving scene). Tasks representing difficult items included activities that required the mother to split her attention between her infant and a non-infant focused task

(e.g., chores scene, survey scene). As presented in Table A2, correlations among these scenes suggest that a range of item difficulty was achieved, with easy items correlating higher with easy items than difficult items, and vice versa.

From these video recordings, maternal responsiveness scores for each task were obtained through a macroscopic coding system (see Appendix C; Kochanska, 1998; Kochanska & Aksan, 2004). Consistent with Ainsworth's (Ainsworth et al., 1971) method as previously discussed, maternal responsiveness was defined as behaviors indicative of sensitivity toward, cooperation with, and acceptance of the infant. A maternal responsiveness score was determined for each scene and ranged from 1 (highly unresponsive) to 7 (highly responsive) with no option of providing a score of 4 (e.g., Kochanska, 1998; Kochanska & Aksan, 2004).

The score for each scene was determined through consensus of 2-4 independent observers. Two independent observers provided a maternal responsiveness score for every scene. All discrepant codes were discussed by the two observers to allow regular realignment of observers and minimization of observer drift. In the case that the two observers disagreed by more than one point, or that they failed to come to a consensus, a third observer provided an independent code for that scene. Inter-rater reliability was good to excellent based on previously established guidelines (Cicchetti, 1994; Landis & Koch, 1977) with intraclass correlation coefficients ranging from .64-.82. The responsiveness score for each individual scene was calculated by averaging all observer codes for that scene. These scores cohered across scenes (α =.76) and, consistent with previous work (Kochanska, 1998; Kochanska & Aksan, 2004) were averaged to create a final maternal responsiveness score for each participant.

Data Analyses

Data were analyzed using SPSS 21 and Mplus 6 (Muthén & Muthén, 2006). Missing data on the self-report measures were addressed using a mean replacement method. A mean for each self-report item was calculated and inputted for each participant who was missing fewer than 25% of items on a scale. Two-tailed tests were used to determine statistical significance except when directional hypotheses were proposed. In the case that a directional hypothesis was proposed, one-tailed significance tests were reported and noted as such.

Analysis of Specific Aim 1

To examine the latent structure of DT, I used confirmatory factor analysis (CFA). Put simply, CFA is a statistical method that is used to test a theory that correlations among a set of variables are actually due to the influence of a smaller number of latent dimensions. Two competing models of DT were tested and compared to determine which model better fit the data. In the one-factor model of DT (see figure B1), all measures of DT were specified as indicators of a common latent construct. In the multidimensional model of DT (see figure B2), the measures of DT were specified to represent indicators of separate latent constructs: cognitive DT, emotional DT, and physical DT. To account for method variance, the residual variances of indicators from the same scale were specified to covary. For example, the latent models included a correlation between the residual variance of the IUS Prospective Anxiety subscale and the residual variance of the IUS Inhibitory Anxiety subscale. The extent to which each model fit the observed data was determined by conventions established in the literature including the χ^2 test, the Root Mean Square Error of Approximation (RMSEA), the

Comparative Fit Index (CFI), the Standard Root Mean Residual (SRMR), and the Bayesian Information Criterion (BIC).

A four step process was used to determine acceptable model-data fit. First, the χ^2 test statistic was examined to determine whether there were significant differences between the covariance matrix implied by the specified model and the covariance matrix produced by the current data. A significant χ^2 test casts doubt on the validity of a model. However, because the χ^2 test statistic is influenced by sample size, a significant χ^2 test was not sufficient to conclude poor model-data fit. The second step in assessing model-data fit was to ensure that the RMSEA, CFI, and SRMR were in an acceptable range: RMSEA≤.10, CFI≥.90, and SRMR≤.10. Next, a 2-index presentation strategy as proposed by Hu and Bentler (1999) was imposed as a more stringent test of model-data fit. In addition to meeting the minimum requirements for RMSEA, CFI, and SRMR, a model was deemed a good fit to the data if it also met one of two conditions: 1) CFI≥.95 with SRMR≤.09, or 2) RMSEA≤.06 with SRMR≤.09. The final step in determining acceptable model-data fit was examination of the BIC. The BIC compares the estimated model to a fully saturated model (i.e., a model that reproduces the sample covariance matrix exactly). A negative BIC indicates that the estimated model is superior to the saturated model.

After specifying a one-factor model and a multidimensional model that both fit the data well, these competing models of DT were compared. The BIC was used to compare models by calculating the difference between the two models' BIC values. With this approach, larger values (i.e., more negative BICs) identify the favored model. Guidelines have been provided indicating that a BIC difference of 0-2 is weak evidence

for favoring one model over the other; a difference of 2-6 is positive/noteworthy evidence, 6-10 is strong evidence, and greater than 10 is very strong evidence for favoring one model over another (Raftery, 1995).

The best supported model of DT was identified using a combination of the primary and secondary samples. Because of this combined sample, the statistical technique of Multiple Group Analysis (MGA) was used to determine whether the supported model of DT was similar across samples. More specifically, MGA was used to test for form invariance and metric invariance between the primary and secondary samples. Form invariance refers to the extent to which the pattern of significant parameter estimates between indicators and latent variables are the same across both groups. In other words, form invariance tested whether the supported model of DT was a good fit to the data from both samples. Metric invariance refers to the extent to which factor loadings from indicators to latent variables are not significantly different across groups. In other words, metric invariance tested whether the influence of the latent DT variable(s) on the DT indicators were the same across samples. Thus, evidence for form and metric invariance would provide support for a similar structure of DT across groups.

To evaluate the models for form invariance, a model was tested which constrained both groups to have the same factor structure of DT. In other words, both samples were fixed to have the same number of latent variables with the same indicators; however, all other aspects of the model (i.e., factor loadings, intercepts) were free to vary across samples. Evidence in support of form invariance was evaluated using the same four step process to determining acceptable model-data fit as described above (i.e., using chi-square, RMSEA, CFI, SRMR, and BIC). After form invariance was established, metric

invariance was tested by constraining the factor loadings from indicators to latent variables to be the same across samples. Again, the four step process to determining acceptable model-data fit was used to evaluate metric invariance. In situations when models of both form invariance and metric invariance are supported, Cheung and Rensvold (2002) have provided recommendations as to how to quantitatively compare models tested through MGA. In addition to the difference in BICs as previously described, these guidelines state that changes ≥ 0.01 in the CFI and ≥ 0.02 in McDonald's Non-centrality Index (NCI) suggest a rejection of the constrained model (i.e., the model that fixes factor loadings to be equal across samples).

Analysis of Specific Aim 2

To examine the convergent validity of DT self-ratings, Pearson's correlations between self-report measures of DT and their respective informant reports were examined for statistical significance and magnitude (Kashy & Snyder, 1995). The estimate that is obtained will be interpreted as the extent to which self- and other-reports of DT are in agreement.

Analysis of Specific Aim 3

Based on the parameter estimates from the supported model of DT as identified in Specific Aim 1, a prenatal DT aggregate score was estimated for each participant in the primary sample. Using this prenatal DT aggregate score, three path analyses were conducted to examine the prospective association between DT and maternal responsiveness. First, a path analysis was tested in which maternal responsiveness was regressed onto prenatal DT. Presence of a statistically significant parameter estimate was interpreted as a non-zero association between the two variables. Second, a path analysis

was conducted to examine the extent to which prenatal DT was associated with maternal responsiveness while accounting for demographic variables. Any demographic variable that demonstrated at least a moderate correlation ($r \geq .30$) with maternal responsiveness was included in the path analysis. Finally, any DT-related variable that demonstrated at least a moderate correlation with prenatal DT was included in a final path analysis to assess the specificity of the DT construct and its association with maternal responsiveness.

Analysis of Specific Aim 4

Because a relatively smaller sample of women was recruited to complete the postpartum assessments, a latent model of postpartum DT could not be tested. However, a postpartum DT score was created by standardizing and aggregating the postpartum DT variables that demonstrated significant factor loadings on the latent DT factor(s) from Specific Aim 1. Specific Aim 4 was then tested in the same manner as Specific Aim 3 as described above.

CHAPTER THREE: RESULTS

Demographics and Preliminary Analyses

A total of 105 women were consented into the primary sample and 261 consented into the secondary sample. However, 19 women in the primary sample completed only the prenatal survey and were, therefore, moved to the secondary sample for analysis. The final primary sample consisted of 86 women. These participants ranged from 19-42 years of age, were predominately Caucasian, married, well educated, and of high socioeconomic status (see Table A3). On average, women in the primary sample completed the prenatal survey at 36.5 weeks (SD=1.79) gestation. The final secondary sample consisted of 280 women. As shown in Table A3, participants in the secondary sample were similar to the primary sample. These participants ranged from 18-47 years of age and, on average, completed the prenatal survey at 35.9 weeks (SD=2.35) gestation.

To determine whether the primary sample and the secondary sample differed statistically on any demographic characteristics, independent samples t-tests were used to compare continuous variables and Fisher's exact tests were used to compare categorical variables. As displayed in Table A3, results showed that the two samples significantly differed in number of weeks gestation upon completing the T1 survey and in education level.

Descriptive statistics for all study variables across all time points are presented in Tables A4-A7. As these tables show, there was no extreme deviation from normality for any variable; all variables showed skew less than 3 and kurtosis less than 10. Independent sample t-tests were performed to determine whether there were significant differences in scores between the primary sample (Table A4) and the secondary sample

(Table A5). Results showed that the mean scores of five DT variables differed between groups. These differences indicated that the primary sample reported higher levels of DT than the secondary sample based on the IUS Prospective Anxiety subscale (t(364)=-2.69, p=.008), the IUS Inhibitory Anxiety subscale (t(172.5)=-3.29, p=.001), the DTS Tolerance subscale (t(364)=2.59, p=.010), the DTS Absorption subscale (t(364)=2.04, p=.042), and the DIS Discomfort Avoidance subscale (t(364)=-2.34, p=.020). Although statistically significant differences were demonstrated, these small differences were the result of a large sample size and the ability to detect trivial differences between groups.

Results of Specific Aim 1

Examine the Latent Structure of DT

Model Testing and Comparison

Correlations among the DT variables are presented in Table A8. As shown in this table, all but one of the DT variables were significantly correlated at p<.01 and ranged in magnitude from small to large (*r*'s = .15-.77). The DIS Discomfort Intolerance subscale was not significantly associated with any DT variable except for its counterpart, the DIS Discomfort Avoidance subscale. Because of this, the DIS Discomfort Intolerance subscale was excluded from model testing. This exclusion led to a total of 12 DT variables included in the models to be tested. Specification of the one-factor model is provided in figure B4 and specification of the multidimensional model is provided in figure B5.

Maximum likelihood estimates revealed that the one-factor model was a good fit to the data (see table A9). Although the model produced a significant chi-square test, it was a good fit to the data according to all other fit indices including the CFI-SRMR combination, and the negative BIC statistic. The multidimensional model also received

support (see Table A9). Again, the chi-square test was significant; however, all other fit indices were in the acceptable range, the model met criteria for the CFI-SRMR combination, and the BIC statistic was negative.

Given that both the one-factor model and the multidimensional model were supported by the data, the BIC was used to determine which model better predicts the data (Raftery, 1993). The difference in BIC values was 16.56, suggesting very strong evidence in favor of the lower (i.e., more negative) BIC. Therefore, the multidimensional model was determined to be the best supported model of DT in this dataset. Parameter estimates from the best supported model showed that all DT variables were significant indicators of the latent factor (see table A10). Physical DT (as assessed by the DIS Discomfort Avoidance subscale) demonstrated moderate correlations with the cognitive DT (ϕ=-.36, p<.001) and emotional DT (ϕ =-.38, p<.001). Further, the correlation between cognitive DT and emotional DT was quite large (ϕ =.79, p<.001). This pattern of correlations suggests that cognitive DT and emotional DT are lower order dimensions of a higher-order DT construct, and that physical DT is a separate but related construct. Thus, the multidimensional model was re-specified into a higher-order model of psychological DT (see figure B6). Because the pattern of free and fixed parameters was identical between the multidimensional model and the higher-order model, fit indices were the same. Parameter estimates for the higher-order model demonstrated large factor loadings for cognitive DT (γ =.87, p<.001) and emotional DT (γ =.91, p<.001). Further, this final model showed that physical DT is related to but distinct from psychological DT (ϕ=-.42, p<.001).

Multiple Group Comparison

Given that only a subset of women completed the postpartum visit, MGA was used to determine whether the best supported model of DT was invariant across the primary and secondary samples. A test of configural/form invariance revealed good fit to the data (see Table A11), suggesting that the pattern of significant parameter estimates between indicators and latent variables are the same across both groups. A test of metric invariance was also a good fit to the data (Table A11). This evidence in support of metric invariance indicates that the factor loadings from indicators to their respective latent variables are not significantly different across groups. In other words, each DT measure was equally indicative of cognitive DT and emotional DT among the primary and secondary samples. Further support in favor of the more restricted, metric-invariant model was provided by a BIC difference >10, suggesting very strong evidence in favor of the metric-invariant model. Additionally, Cheung and Rensvold's (2002) guidelines provide further support for metric invariance because the NCIs differed by <0.02 and the CFIs differed by <0.01. Taken together, these findings provide support for a similar factor structure of DT in the primary and secondary samples.

Results of Specific Aim 2

Examine the Convergent Validity of DT Self-ratings

Informant reports of prenatal DT were completed for 64 of the participants (see Table A6 for descriptive statistics). A majority of the informants were spouses/partners of the participants (85.9%), with the remaining informants being mothers (6.3%), friends (3.1%), siblings (3.1%), and mother-in-laws (1.6%). On average, participants reported knowing their informant for 10.75 years (SD=7.22) with relationships ranging from 3 to 35 years. Pearson's correlations between self-report measures of DT and their respective

informant reports are presented in Table A12. Most of these convergent correlations were statistically significant and showed moderate to large associations between self and other reports of DT (*r*'s = .27-.53). The three DT measures that did not demonstrate significant convergent correlations were the DTS Tolerance subscale (r=.20, p=.066, one-tailed), the DTS Regulation subscale (r=.20, p=.066, one-tailed), and the FDS Discomfort Intolerance subscale (r=.16, p=.109, one-tailed).

Results of Specific Aim 3

Examine the Longitudinal Association between DT and Maternal Responsiveness

A total of 86 women completed both the prenatal survey and the postpartum visit. These participants gave birth between 36.29 and 42.14 weeks gestation (M=39.77, SD=1.00). On average, home visits were completed when infants were 18 weeks old (SD=1.36, range 15.57-21.43). Responsiveness scores for each scene are presented in Table A2. Final maternal responsiveness scores ranged from 2.50 to 6.28 with an average of 4.69 (SD=0.82).

Because a sample size of 86 is not sufficient to conduct CFA of this complexity, a prenatal DT aggregate score was estimated for each participant. Results from Specific Aim 1 indicated that the factor structure of DT was invariant across the primary and secondary samples, therefore, the parameter estimates from the supported model of DT using the full sample (N=366) were used to calculate a prenatal DT factor score for each participant. This prenatal DT score represented the higher-order DT factor (i.e., psychological DT), and therefore did not include physical DT (i.e., DIS Discomfort Avoidance subscale).

In the first of three path analyses used to test Specific Aim 3, prenatal DT demonstrated a small, positive association with maternal responsiveness (γ=.191,

SE=.104, one-tailed p=.033). Next, demographic variables that demonstrated at least a moderate association ($r \geq .30$) with maternal responsiveness were added to the path analysis. As displayed in Table A13, these variables included race, marital status, education level, and employment status. Parameter estimates for this path analysis show that all variables are significantly associated with maternal responsiveness, except for education level (see figure B7). Being married (γ=.22, SE=.11, p=.04), Caucasian (γ=.33, SE=.09, p<.01), and not employed (γ=.25, SE=.09, p<.01) were significantly associated with higher levels of responsiveness. Furthermore, after accounting for covariation with demographic variables, prenatal DT was still significantly associated with maternal responsiveness (γ=.146, SE=.084, one-tailed p=.041). Evaluation of 95% confidence intervals for each parameter estimate revealed no variable that demonstrated a significantly larger or smaller association with responsiveness than the other variables. This model accounted for 38.7% of the variance in maternal responsiveness.

Finally, any DT-related variable that demonstrated at least a moderate correlation ($r \geq .30$) with prenatal DT was added to the model. Avoidant coping was the only variable to meet this criteria (see Table A13), and the parameter estimates from the path analysis including this final variable are presented in figure B8. This final model accounted for 39.3% of the variance in maternal responsiveness which was not a significant change from the previously estimated model (change in R^2=.006, F(1,79)=.900, p=.346). Although this model did not account for a greater amount of variability in maternal responsiveness, it did show that prenatal DT dropped to non-significance after including avoidant coping (γ=.107, SE=.093, one-tailed p=.126). The association between demographic covariates and maternal responsiveness, however,

remained unchanged after including avoidant coping in the model. Being married (γ=.21, SE=.11, p=.05), Caucasian (γ=.32, SE=.09, p<.01), and not employed (γ=.24, SE=.09, p<.01) were still significantly associated with higher responsiveness. These findings suggests that DT and avoidant coping are associated with overlapping variability in maternal responsiveness

Because physical DT was identified as distinct from psychological DT, the association between physical DT and maternal responsiveness was examined separately. A one-tailed correlation revealed small, non-statistically significant association between maternal responsiveness and the Discomfort Intolerance Scale (r=-.15, p=.09).

Results of Specific Aim 4

Examine the Concurrent Association between DT and Maternal Responsiveness

Of the 86 women who completed both the prenatal survey and the home visit, 80 women completed the postpartum survey. On average, these participants completed the postpartum survey 1.42 weeks (SD=1.62; range 0-7 weeks) following the home visit. Paired-samples t-tests revealed significant differences in average scores for prenatal DT and postpartum DT (see Table A14). On average, women reported higher levels of DT during the postpartum assessment than during the prenatal assessment; however, these differences were relatively small in magnitude.

Because the secondary sample did not complete the postpartum survey, a latent model of postpartum DT could not be tested due to insufficient sample size. However, because the results from Specific Aim 1 supported a higher-order model of DT, it was deemed appropriate to create a postpartum DT aggregate score by calculating an aggregate of the eleven DT indicators of psychological DT. To confirm that this approach to creating a postpartum DT aggregate score was appropriate, the same

aggregation was performed on the prenatal DT data. A prenatal DT aggregate score demonstrated a large correlation with the estimated prenatal psychological DT factor score used in Specific Aim 3 ($r=.94$, $p<.001$), providing further support for using this approach in creating a postpartum DT aggregate score. A Spearman correlation showed a large association between prenatal DT and postpartum DT ($r=.814$, $p<.001$).

In the first path analysis used to test Specific Aim 4, postpartum DT demonstrated a small association with maternal responsiveness; however, this parameter was not statistically significant ($\gamma=.086$, $SE=.111$, one-tailed $p=.220$). Because this association was not statistically significant, the proposed model including demographic and DT-related variables was not tested.

The correlation between maternal responsiveness and postpartum physical DT revealed a similar pattern to that of Specific Aim 3. A one-tailed correlation revealed small, non-statistically significant association between maternal responsiveness and the Discomfort Intolerance Scale ($r=-.15$, $p=.09$).

CHAPTER FOUR: DISCUSSION

The present study was the first to examine longitudinal and concurrent associations between DT and maternal responsiveness. To achieve this end, the construct validity of perinatal DT was also tested. Results from Specific Aim 1 and Specific Aim 2 provided support for the factorial and convergent validity of perinatal DT. Further, results from Specific Aims 3 and 4 demonstrated that prenatal psychological DT was significantly associated with maternal responsiveness, whereas postpartum psychological DT was not. Furthermore, physical DT was not associated with maternal responsiveness in either prospective or concurrent analyses. These findings expand upon previous studies and, as will be discussed, have significant implications for future research and clinical practice.

Evidence for the Construct Validity of DT

Factorial Validity of DT

Findings from the present study build upon previous research by demonstrating that DT may be best understood as a multifaceted construct rather than a unidimensional construct. Results suggest that DT was best represented as a higher-order factor comprised of cognitive DT and emotional DT in this dataset. Furthermore, these results suggest that physical DT is distinct from, but related to psychological DT. This finding is consistent with results from a previous structural analysis of DT that showed discomfort intolerance as separate from a higher-order DT factor (Bernstein et al., 2009). It is important to note that our understanding of the latent structure of DT in this data set would be enhanced by the use of additional statistical approaches, including exploratory factor analysis (EFA). The goal of this study was to compare two different theoretical

models of DT in a sample of perinatal women; however, exploring these data in the context of an EFA may inform the refinement of these theoretical models.

Researchers of the DT construct have argued for a model that integrates the various conceptualizations of DT (Bernstein et al., 2009; Leyro et al., 2010; McHugh & Otto, 2012; Zvolensky et al., 2010). Moving forward, these findings suggest that DT may be studied from at least three different perspectives. First, researchers may study the shared variance among the DT constructs as represented by the higher-order psychological DT factor. Second, researchers may examine the unique variance represented by the facets of cognitive DT and emotional DT. Third, researchers may consider the additional variance in outcomes that may be explained by physical DT. In the area of parenting behavior, for example, it may be the case that emotional DT influences maternal responsiveness above and beyond the variance explained by psychological DT. The present study lacked a large enough sample size to test the unique effects of DT facets on maternal responsiveness. However, testing both the shared and unique effects of DT on a variety of outcomes, including the onset and maintenance of psychopathology, would provide valuable information about how best to target DT skills in treatment settings.

Convergent Validity of DT

Most informant ratings of prenatal DT demonstrated moderate to large associations with self-report ratings. These correlations are consistent with those reported in the literature for self-other agreement on trait-like constructs (Connolly et al., 2007) and provide support for the validity of self-reported DT. The range of convergent correlations (.16-.53) suggests that there may be differences in the visibility of the

different DT constructs. Indeed, previous research has demonstrated that traits that are easier to observe lead to larger convergent correlations (e.g., Watson & Clark, 1991).

Self-report assessments are a helpful tool commonly used by clinicians for the purposes of treatment planning and outcome assessment (Froyd, Lambert & Froyd, 1996; Harkness & Lilienfeld, 1997). Given the prevalence of DT-related skills training across a variety of psychotherapies, it is important to know whether self-reported DT represents a valid account of an individual's difficulties. Consistent with previous research pertaining to the validity of self-reported traits (Ready & Clark, 2002; Watson et al., 2000), the present findings provide initial support for reliance on self-reports of DT. The use of individual reports of DT may aid clinicians in treatment planning with regard to the extent DT skills may benefit a given patient.

Associations between DT and Maternal Responsiveness

Findings from the present study are promising with respect to the potential role of DT in understanding responsive parenting. However, given the magnitude and pattern of effects in the present study, it is important that alternative hypotheses and explanations be considered. The large associations among demographic risk factors and responsiveness observed in this study were not unexpected. Research has demonstrated that demographic characteristics are associated with maternal responsiveness (Johnston, Murray, Hinshawk, Pelham, & Hoza, 2002; McFadden & Tamis-LeMonda, 2013). More specifically, studies have demonstrated that traditional demographic risk factors including low socioeconomic status and single marital status are more strongly associated with responsiveness to infant non-distress than responsiveness to infant distress (see Leerkes et al., 2012). This suggests that findings from the present study may have differed if a

multi-domain approach to assessing responsiveness has been used (e.g., responsiveness to distress vs. non-distress). This measurement approach will be discussed further in the context of study limitations.

Prenatal psychological DT was associated, albeit small in magnitude, with maternal responsiveness, whereas postpartum psychological DT was not. This finding, in combination with the findings that DT demonstrated high rank-order stability and positive mean-level change from pregnancy to postpartum, suggests there was a subset of women with low prenatal DT who reported increased DT during the postpartum period. This finding may be explained, in part, by a theory of personality coherence. Caspi and Moffitt (1993) proposed that new situations where there is pressure to behave may result in either an amplification of individual traits or in behavior change, depending on specific characteristics of the situation. Existing traits are expected to heighten in new situations where there is no information about how to behave adaptively. In contrast, individuals are expected to modify their behavior in new situations where there is information about how to behave adaptively and when previous responses are discouraged (Caspi & Moffitt). Applied to the present study, it may be the case that caring for a newborn represents a condition that favors change for women who are low in DT. Indeed, there are certainly some social norms providing information about how to appropriately behave with a newborn (e.g., responding to infant cries), and caring for a newborn is likely a situation in which previous responses related to low DT are discouraged (e.g., avoiding the situation that is causing distress). Thus, perhaps motherhood presented this subset of women an opportunity for behavioral change, resulting in a modification of their dispositional tendency to be intolerant of distress. Although this is speculation, it does

highlight how the trajectory of DT across the perinatal period may be an important variable in understanding maternal mental health and parenting outcomes.

There is relatively new theoretical work in the DT literature that may challenge the main hypothesis of this study, i.e.—higher levels of DT are associated with higher levels of responsiveness. A construct of distress overtolerance has been proposed and it refers to the toleration of high levels of distress that are not consistent with an individual's goals and values (Lynch & Mizon, 2011). This theoretical perspective may have important implications for the study of DT. With regard to the present study, it may be the case that women with very high levels of DT struggle through periods of prolonged distress as they adjust to caring for an infant when their psychological well-being would benefit from the occasional escape or avoidance of distress during those early postpartum months. Furthermore, the consequences of distress overtolerance are not only adverse for the mother's well-being, but also for the infant. A woman with high DT may not necessarily be motivated to respond promptly to her infant's cries. In other words, the ability to tolerate distress is not sufficient to produce responsive parenting; the mother must also be aware of the importance of responding promptly, appropriately, and affectionately to her infant's signals.

In addition to considering that high DT may not always be adaptive, we must also entertain the possibility that low DT may not always be maladaptive. For example, women with low levels of DT may be very quick to respond to their infants' cries. From a naïve observer's perspective, this mother may be engaging in adaptive parenting behavior by promptly responding to her infant. However, this behavior may be based on a parent-focused goal of decreasing the mother's distress, rather than a child-focused goal

of helping her infant feel better. Regardless of whether a woman's behavior is based on a parent- or child-focused goal, the action may be the same, i.e. -- quickly responding to her infant's cries. And although this would appear to suggest that low DT may be associated with higher levels of maternal responsiveness, this hypothesis overlooks the multifaceted nature of maternal responsiveness. A woman who responds with haste in an effort to escape the distress that accompanies the sound of her crying infant is not likely to demonstrate the many other behaviors that denote responsive parenting. In other words, a woman with low DT may respond quickly to her infant when he/she cries, but she may not also correctly interpret her infant, respond appropriately to her infant, or demonstrate warmth, affection, and acceptance to her infant. This account is consistent with research demonstrating that child-focused goals are associated with more adaptive parenting behaviors than parent-focused goals (Dix, Gershoff, Meunier & Miller, 2004; Leerkes, 2010). The literature further supports this account by showing that behavior under control of aversive motivation is associated with negative affect compared to behavior under control of appetitive motivation (Carver & White, 1994).

The finding that DT and avoidant coping were associated with overlapping variability in maternal responsiveness indicates that it may not be DT per se that is associated with maternal responsiveness. In fact, it may be a broader, higher-order latent construct that encompasses both DT avoidant coping that explains variability in maternal responsiveness. For example, both DT and avoidant coping may be conceptualized as lower-order facets of emotion regulation (Leyro et al., 2010; Simons & Gaher, 2005). The theoretical framework for the present study may be expanded to consider that it is more generally a mother's tendency to engage in adaptive emotion regulation processes

that influences her ability to respond sensitively to her infant. This finding regarding the overlapping variability in DT and avoidant coping has two noteworthy implications. First, the present study addressed the validity of DT as a construct; however, results provide further support for the argument that more work is needed to better understand DT's placement among related constructs such as avoidant coping and emotion regulation (Leyro et al., 2010). Second, researchers would benefit from examining a broader range of DT-related constructs to determine what prenatal processes best explain variability in maternal responsiveness. For example, it would be informative to know whether our interventions should be targeting emotion dysregulation processes more broadly, or whether our efforts are best directed toward specific processes such as DT.

In addition to considering these findings in the context of broader emotion-regulation processes, an alternative theoretical framework may inform the present results. From the perspective of attachment theory, mothers engage in unresponsive parenting because of their adult attachment style, or their schema for interpersonal relationships that is based on their personal history of experiences with caregivers (Bretherton, 1999; Main, 2000). Adult attachment styles have been conceptualized as patterns of emotion regulation (Mikulincer & Shaver, 2008), and one attachment style in particular may represent an important moderator in the present analyses. Individuals with a dismissive-avoidant attachment style engage in an emotion regulation pattern that is characterized by deactivation strategies (Fraley et al., 1998). These deactivation strategies serve to restrict the individual's access to attachment related information and minimize the personal significance of this information. This distancing from attachment-related information is

achieved by avoidance of situations, tasks, and relationships that may elicit attachment thoughts, memories, and responses.

The dismissive-avoidant pattern of emotion regulation has implications for the present study. First, individuals with a dismissive-avoidant attachment style would be expected to exhibit low levels of maternal responsiveness because of their tendency to avoid situations that might activate attachment-related information, including demonstrating care for their infant. Indeed, previous research has demonstrated that dismissive-avoidant mothers engage in maladaptive parenting behaviors (van IJzendoorn, 1995). Second, individuals with this attachment style would be expected to have high levels of perceived DT. A search of the literature revealed no study that examined the association between attachment style and DT. However, dismissive-avoidant adults are typically categorized as self-reliant individuals who do not acknowledge subjective distress and who report little distress to attachment-related stressors (Kidd & Sheffield, 2005; Feeney & Ryan, 1994; Fraley et al., 1998). These low levels of reported distress among dismissive-avoidant adults are due to their proficiency in avoiding attachment-related distress, and not due to a lack of experienced distress (Dozier & Kobak, 1992; Fraley et al.). Taken together, theoretical and empirical findings pertaining to dismissive-avoidant mothers suggest that they may report high levels of DT yet engage in low levels of maternal responsiveness. Future studies should consider the role of attachment behavior patterns as a moderator of the DT-responsiveness link.

These alternative hypotheses regarding the association between DT and maternal responsiveness highlight the variety of ways in which future studies may be designed to address important questions regarding processes that may explain dysfunctional

parenting. The present study had a number of strengths, including prospective data collection, multi-method assessments of prenatal DT, and observational assessments of maternal responsiveness. However, the present findings must be interpreted in light of study limitations which, as will be discussed, present additional opportunities for future research in this area.

Implications and Future Directions

Limitations and Future Research

Although the current sample was representative of the towns surrounding the University of Iowa, it is not representative of the general population. Indeed, the current sample was not particularly diverse with respect to marital status or socioeconomic status which, as was shown in the present study and many other studies, are all associated with parenting behavior (Johnston, Murray, Hinshaw, Pelham & Hoza, 2002; McFadden& Tamis-Lemonda, 2013).

Examining the construct validity of DT and its association with maternal responsiveness in more diverse populations is necessary to support the generalizability of these findings. Furthermore, cultural differences in the association between DT and responsiveness is an open area for future research. A large body of work has identified the important role of culture in understanding parenting practices (Harkness & Super, 2002). In contrast, a search of the literature revealed no studies that directly examine cultural differences in DT. Given the cross-cultural differences in the concept of 'self' and in perspectives on dependence and interdependence in caregiving (Bornstein, 1995; Schwartz, 1994), one might expect the association between DT and responsiveness to differ across cultures. For example, a woman from a collectivist culture may endorse

high levels of DT because it is the collective self (e.g., family attitudes and values) that an individual from this culture expresses. Although this woman's expression of her functioning may be based on a collectivist perspective, the responsiveness she displays toward her infant may be based on her own independent functioning. In this example, we may not observe an association between DT and maternal responsiveness, whereas we would be more likely to see this association in an individualist culture.

The assessment methods used in the present study were a significant strength; however, there are a number of ways in which these methods might be improved. First of all, it is important to consider the extent to which our measures are adequately assessing constructs in the population of interest. Test theory tells us that items of different difficulty vary in the amount of information they provide about a given trait depending on an individual's level of that particular trait (Reise, Ainsowrth & Haviland, 2005). Test theory also says that measures have more reliability and variance if inter-item correlations are high and variance of item difficulty is low (Gulliksen, 1945). Inter-item correlations in the present measure of maternal responsiveness ranged from low to high (r's = .19-.66) and, as discussed in the Method section, the pattern of inter-item correlations suggests that there is likely a range of item difficulty from easy (i.e., play scene and mobile scene) to difficult (i.e., chores scene and survey scene). Thus, the measurement of responsiveness in the current study may have been improved by including more scenes of moderate difficulty (e.g., the bath scene). Furthermore, given that the present sample was relatively high functioning, the measurement of maternal responsiveness may have been improved with the exclusion of easy items at the expense of more moderate to difficult items. Although it is important to have a breadth of item

difficulty, it is also important to identify items that will perform best for a particular sample.

The measurement of maternal responsiveness may also be improved by considering specific domains of maternal responsiveness. Previous research has demonstrated the specificity of maternal responsiveness in predicting child outcomes, and researchers have begun to emphasize the utility of applying a multi-domain approach to the study of maternal sensitive responding (Leerkes et al., 2012). The present study operationalized maternal responsiveness broadly to encompass the various important domains of the construct; however, it may be that different domains of responsiveness are associated with DT in unique ways. The tendency for individuals low in DT to avoid distressing situations supports the hypothesis that DT would demonstrate stronger associations with responsiveness to infant distress than with responsiveness to non-distress situations (e.g., play, vocalizations). This may be an important area for future research, and may explain the small magnitude of effects demonstrated in the present study.

Another way to improve the measurement methods in the current study would be to have included a behavioral assessment of DT. Although informant reports were obtained to validate self-report ratings of DT, the inclusion of behavioral measures of DT would have provided a more robust assessment of the construct. Measures of the behavioral capacity to withstand distress exist; however, behavioral measures of the perceived capacity to tolerate distress are needed (Leyro et al., 2010), and context-specific behavioral measures of DT may be particularly useful. In their study of DT, Rutherford, Goldberg, Luyten, Bridgett, and Mayes (2013) assessed infant-related DT by

asking mothers to soothe an inconsolable life-like baby simulator that would continuing crying for a fixed period of time unless the mother chose to terminate the task. A similar approach may inform studies of DT and parenting. For example, pregnant women could be exposed to a standardized infant DT task and asked to rate their expected tolerance prior to beginning the task and their perceived tolerance throughout the task.

A context-specific behavioral measure of DT would be beneficial in at least two ways. First, it would provide a multi-measure multi-method approach to assessing DT which is a significant strength in psychological studies (Campbell & Fiske, 1959; Podsakoff, MacKenzie & Podsakoff, 2012). Second, this approach would provide an assessment of DT that is relevant to the context of interest, i.e.—parenting tasks. Whether a context-specific assessment of DT is more informative than general levels of DT is a question for future research. In their study using the baby simulator, Rutherford and colleagues found that this was indeed the case. That is, infant-related DT was associated with parental ability to reflect on their own and their children's mental state, whereas general DT was not associated with this reflective functioning. Knowledge regarding the influence of infant-related DT vs. general DT on future maternal responsiveness would have significant implications for the way in which DT is targeted during intervention.

Implications for Clinical Practice

Existing empirical and theoretical work suggest that emotion regulation skills be integrated into interventions for parents more broadly. In addition to this study, previous research has demonstrated that emotion regulation processes may be identified during pregnancy, before any maladaptive parenting interactions have had the chance to become

habitual (Leerkes et al., 2011). Interventions should address these processes, ideally during pregnancy, to promote optimal mother-child outcomes.

One way to address deficits in DT that may improve responsive parenting is to incorporate DT skills into existing parenting interventions. A number of efficacious parenting interventions exist; however, few of these interventions emphasize parental emotion regulation (Kaminski, Valle, Filene & Boyle, 2008; Lundahl, et al., 2006). An exception to this is the attachment-based intervention called Circle of Security (Hoffman, Marvin, Cooper, & Powell, 2006) because it recognizes the mothers' attachment behaviors as emotion-regulation patterns that are used to formulate individualized treatment plans. Given the limited number of parenting interventions that emphasize parental emotion regulation as a target of treatment, and given that parenting interventions are shown to be less effective in the presence of psychopathology (Beth-Porath, 2010), a greater emphasis on parental emotion regulation processes, including DT, may be beneficial. For example, mothers who are low in DT may learn effective parenting skills in the context of an intervention; however, the tendency for these mothers to avoid or become preoccupied by distress may prevent them from accessing these helpful skills in the presence of parent-child stress. Thus, incorporating DT skills into existing parenting interventions may represent an enhancement that improves maternal deficits in emotion regulation so that these mothers may effectively implement adaptive parenting strategies.

Additionally, the timing of these interventions is an important factor for consideration. Many parenting interventions are designed to be implemented after the child is born when problematic parent-child interactions have already been identified.

Previous studies have demonstrated that parenting programs implemented during pregnancy may be effective in improving parenting and child outcomes (Feinberg, Kan & Goslin, 2009; Milgrom, Schembri, Ericksen, Ross & Gemmill, 2011). Thus, combining the knowledge we have gained from existing parenting programs may inform the development of preventative programs that are implemented during pregnancy, that emphasize parental emotion regulation skills, and that improve dysfunctional parenting behavior.

Another way that clinicians may address maternal DT during pregnancy is to approach it from the perspective of general maternal mental health. Such interventions might focus specifically on building general DT skills to improve overall maternal well-being and could be delivered in a variety of forms. Existing perinatal mental health interventions include supportive listening visits, psychoeducation, individual and group therapy, and peer support (O'Hara & McCabe, 2013; Segre, O'Hara & Perkhounkova, 2014; Sockol, Epperson & Barber, 2011), any of which could incorporate general DT skills for pregnant women.

Whether or not targeting general DT skills in the absence of parenting skills would address dysfunctional parenting behavior is a question for future research. However, many DT-related interventions have been shown to influence improvements in domains other than the primary target area (e.g., Gregg, Callaghan, Hayes & Glen-Lawson, 2007; Lillis, Hayes, Bunting & Masuda, 2009; McCracken & Vowles, 2014). Further, targeting DT-skills during pregnancy may also serve to protect the developing fetus from the many adverse effects of prenatal maternal stress (Van den Bergh, Mulder, Mennes & Glover, 2005). Future research is needed to examine whether existing

parenting interventions and perinatal mental health interventions may be enhanced by the inclusion of DT-skills and by adaptations that allow for the intervention to be implemented during pregnancy.

Conclusions

The integration of theory, research, and practice is critical to advancing the science of parenting. By studying emotion regulation processes that are theoretically relevant to parenting behavior, researchers may elucidate important processes that may be involved in dysfunctional parenting. This line of study has implications for the field in that it will begin to identify parenting processes that are common across populations whose responsiveness to infants is known to be compromised. In turn, this work will inform the refinement of interventions that address fundamental deficits in parenting and so will be broadly applicable to at-risk populations. Findings from the present study suggest that psychological DT is a construct that may be identified during pregnancy and is associated with future maternal responsiveness. The present investigation improves our understanding of how emotion regulation processes may be associated with dysfunctional parenting, and how existing interventions may be modified to be more effective across at-risk groups. This study and future studies along this line of research may be used to inform the refinement of interventions aimed at increasing maternal responsiveness and, ultimately, improving child outcomes.

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APPENDIX A: TABLES

Table A1. Instructions to Participants for the Home Visit Scenes

Scene	Length	General instructions to subject
Play	5 minutes	Play with your baby in any way that you want. You may choose to use the toys or you may choose to not use the toys. Simply play with your baby as you normally do until I say 'stop.'
Kitchen chores	10 minutes	Work on kitchen chores until I say stop. Chores may be anything you choose, including washing dishes, cleaning out a cupboard, preparing yourself a snack, etc. Just be sure to continue doing chores until I say 'stop.' During this time, you should interact with your baby however you normally do when you are busy completing chores.
Mobile	1 minute (mom) 3 minutes (mobile) 5 minutes (mom)	Look at your infant for 1 minute while smiling, but do not talk or touch him/her. When I say stop, please move away so that your baby cannot see you. I will hold these mobiles in front of your baby for a few minutes. When I say 'okay,' you will come back over here and interact in with your baby in any way that you want until I say 'stop.'
Bath & caregiving	15 minutes	Give your baby a bath as you normally would. When I say start, you will do your baby's normal bath time routine from beginning to end-- from getting the water ready to getting him/her dressed. Please include all of the steps of your baby's bath time routine. As an example, if he/she normally uses a lotion after the bath, make sure to include this. If you finish his/her bath before I say 'stop,' please continue to interact with your baby in a caregiving manner, such as brushing his/her hair, checking his/her fingernails, etc.
Paperwork	5 minutes	Complete this questionnaire. During this time, you should interact with your baby as you normally would when you are busy with tasks like paperwork.

Table A2. Descriptive Statistics and Correlations among Home Visit Scenes

Variable	1	2	3	4	5	6
1. Play scene	-----					
2. Chores scene	0.28	-----				
3. Mobile scene	0.51	0.34	-----			
4. Bath & caregiving scene	0.47	0.46	0.66	-----		
5. Survey scene	0.23	0.51	0.19	0.30	-----	
6. Total responsiveness	0.64	0.75	0.75	0.83	0.64	-----
Mean	5.37	4.24	5.13	4.67	3.96	4.69
Standard deviation	0.75	1.27	1.05	1.35	1.10	0.82

Note. *N*=79-85. All correlations greater than .22 are significant at p<.05.

Table A3. Demographics and Comparison of Primary and Secondary Samples

	Primary Sample		Secondary Sample		Comparison
Variable	Mean	SD	Mean	SD	Two-sample *t*-test
Participant age (years)	30.3	4.3	30.1	5.2	t(364)=0.27, p=.788
Number of children in the home	1.0	1.1	0.9	1.2	t(362)=0.61, p=.544
Weeks gestation during T1 survey[a]	36.5	1.8	35.9	2.4	t(183.6)=2.51, p=.013
Variable	Freq	%	Freq	%	Fisher's exact test
Race					*p* = .182
Caucasian	76	88.4	252	90.6	
African American	1	1.2	10	3.6	
Asian	8	9.3	11	3.9	
Other	1	1.2	5	1.8	
Hispanic	3	3.5	13	4.7	*p* = .772
Employed	62	72.1	207	73.9	*p* = .780
Marital status					*p* = .080
Married	77	89.5	214	76.4	
In a relationship, living with partner	5	5.8	37	13.2	
Single, never married	3	2.8	18	6.4	
Other	1	1.2	11	4.0	

Table A3. Continued

	Primary Sample		Secondary Sample		Comparison
Variable	Freq	%	Freq	%	Fisher's exact test
Education					*p* = .001
Did not complete high school	0	0.0	8	2.9	
High school diploma/GED	5	5.8	23	8.2	
Associate's/technical school/some college	12	14.0	81	29.0	
Bachelor's degree	24	27.9	87	31.1	
Master's or doctoral degree	45	52.4	81	28.9	
Total household income					*p* = .198
< 20,000	8	9.6	38	13.7	
20-30,000	9	10.7	29	10.5	
30-40,000	8	9.5	22	7.9	
40-50,000	2	2.4	25	9.0	
> 50,000	57	67.8	163	58.8	

Note. *N*=84-86 for the primary sample; *N*=277-280 for the secondary sample; SD=standard deviation; Freq=frequency; [a]an adjusted t-statistic is reported due to unequal variances.

Table A4. Descriptive Statistics for Primary Sample at Prenatal Assessment

				Skewness		Kurtosis		
Scale	*N*	Mean	SD	Statistic	Std. Error	Statistic	Std. Error	Alpha
MSTAT-II	85	42.58	6.5	-0.06	0.26	-0.27	0.52	0.83
IUS-PA	86	14.41	4.4	0.74	0.26	0.25	0.51	0.80
IUS-IA	86	10.49	3.3	0.28	0.26	-0.76	0.51	0.73
DTS-toleration	86	3.76	0.9	-0.57	0.26	-0.47	0.51	0.78
DTS-appraisal	86	4.06	0.7	-1.13	0.26	0.98	0.51	0.79
DTS-absorption	86	3.80	0.9	-0.69	0.26	-0.07	0.51	0.79
DTS-regulation	86	3.59	0.9	-0.60	0.26	0.00	0.51	0.73
FDS-DI	86	14.95	4.5	0.64	0.26	0.43	0.51	0.85
FDS-E	86	19.09	4.4	0.03	0.26	-0.94	0.51	0.75
FDS-EI	86	17.29	5.2	0.18	0.26	-0.86	0.51	0.82
FDS-A	86	20.39	5.1	-0.01	0.26	-0.44	0.51	0.79
DIS-DI	86	4.87	2.5	0.34	0.26	0.20	0.51	0.91
DIS-DA	86	6.36	3.6	0.57	0.26	0.34	0.51	0.77
Avoidant coping	86	6.37	1.4	0.80	0.26	0.14	0.51	0.76
Active coping	86	12.62	2.0	-0.41	0.26	0.14	0.51	0.84
NEO-FFI	86	14.43	7.0	0.38	0.26	-0.17	0.51	0.80
LTE-Q	86	1.42	1.9	2.26	0.26	6.87	0.51	-----

Note. SD=standard deviation; Std. Error=standard error; MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance; LTE-Q=List of Threatening Experiences Questionnaire

Table A5. Descriptive Statistics for Secondary Sample

				Skewness		Kurtosis		
Scale	*n*	Mean	SD	Statistic	Std. Error	Statistic	Std. Error	Alpha
MSTAT-II	280	41.10	6.8	0.13	0.15	-0.24	0.29	0.82
IUS-PA	280	16.10	5.3	0.80	0.15	0.81	0.29	0.86
IUS-IA	280	11.93	4.1	0.61	0.15	-0.03	0.29	0.81
DTS-toleration	280	3.45	1.0	-0.45	0.15	-0.49	0.29	0.80
DTS-appraisal	280	3.88	0.8	-0.71	0.15	-0.18	0.29	0.82
DTS-absorption	280	3.55	1.0	-0.44	0.15	-0.60	0.29	0.82
DTS-regulation	279	3.52	1.0	-0.47	0.15	-0.16	0.29	0.76
FDS-DI	280	15.77	4.5	0.57	0.15	0.65	0.29	0.82
FDS-E	280	19.97	5.3	0.12	0.15	-0.22	0.29	0.82
FDS-EI	280	17.57	5.4	0.40	0.15	0.13	0.29	0.84
FDS-A	280	20.77	5.2	0.27	0.15	0.10	0.29	0.82
DIS-DI	280	4.68	2.9	0.58	0.15	-0.03	0.29	0.87
DIS-DA	280	7.43	3.8	0.29	0.15	-0.07	0.29	0.73

Note. SD=standard deviation; Std. Error=standard error; MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

Table A6. Descriptive Statistics for Informant Sample

				Skewness		Kurtosis		
Scale	*n*	Mean	SD	Statistic	Std. Error	Statistic	Std. Error	Alpha
MSTAT-II	64	41.55	8.2	-0.14	0.30	-0.64	0.59	0.89
IUS-PA	64	15.79	5.3	0.79	0.30	-0.04	0.59	0.82
IUS-IA	64	11.85	4.2	0.64	0.30	-0.32	0.59	0.80
DTS-toleration	64	3.75	1.1	-0.85	0.30	-0.11	0.59	0.88
DTS-appraisal	64	3.88	0.9	-0.93	0.30	0.28	0.59	0.86
DTS-absorption	64	3.69	1.1	-0.90	0.30	-0.14	0.59	0.87
DTS-regulation	64	3.70	0.9	-0.34	0.30	-0.54	0.59	0.75
FDS-DI	64	14.50	5.1	0.95	0.30	0.59	0.59	0.89
FDS-E	64	18.03	5.8	0.12	0.30	-0.48	0.59	0.89
FDS-EI	64	15.66	5.7	0.64	0.30	-0.33	0.59	0.86
FDS-A	64	18.23	6.1	0.59	0.30	0.28	0.59	0.88
DIS-DI	64	4.00	3.3	0.72	0.30	-0.24	0.59	0.95
DIS-DA	64	7.74	4.1	0.03	0.30	-0.60	0.59	0.74

Note. SD=standard deviation; Std. Error=standard error; MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

Table A7. Descriptive Statistics for Primary Sample at Postpartum Assessment

				Skewness		Kurtosis		
Scale	*n*	Mean	SD	Statistic	Std. Error	Statistic	Std. Error	Alpha
MSTAT-II	80	43.21	7.3	0.25	0.27	-0.19	0.53	0.85
IUS-PA	80	13.98	4.4	0.58	0.27	-0.24	0.53	0.83
IUS-IA	80	10.37	3.5	0.49	0.27	-0.70	0.53	0.72
DTS-toleration	80	3.87	0.8	-0.29	0.27	-0.66	0.53	0.74
DTS-appraisal	80	3.99	0.7	-0.50	0.27	-0.34	0.53	0.79
DTS-absorption	80	3.78	1.0	-0.57	0.27	-0.46	0.53	0.86
DTS-regulation	80	3.70	0.9	-0.46	0.27	-0.51	0.53	0.71
FDS-DI	80	14.30	4.3	0.32	0.27	-0.03	0.53	0.81
FDS-E	80	17.86	5.5	0.01	0.27	-0.83	0.53	0.86
FDS-EI	80	15.26	5.0	0.32	0.27	-0.55	0.53	0.80
FDS-A	80	18.56	5.6	0.13	0.27	-0.82	0.53	0.84
DIS-DI	80	4.43	2.9	0.71	0.27	0.08	0.53	0.87
DIS-DA	80	6.20	3.7	0.57	0.27	0.15	0.53	0.73
Avoidant coping	80	5.98	1.2	0.46	0.27	-0.17	0.53	0.70
Active coping	80	12.48	2.0	-0.23	0.27	-0.48	0.53	0.85
NEO-FFI	78	13.69	5.6	0.66	0.27	-0.33	0.54	0.82
LTE-Q	77	1.23	1.6	1.82	0.27	3.28	0.54	-----
PSI-SF	78	57.81	15.4	1.31	0.27	2.25	0.54	0.92

Note. SD=standard deviation; Std. Error=standard error; MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance; LTE-Q=List of Threatening Experiences Questionnaire; PSI-SF=Parenting Stress Index, Short Form

Table A8. Correlations among Prenatal DT Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. MSTAT-II	-----											
2. IUS-PA	-0.56	-----										
3. IUS-IA	-0.49	0.77	-----									
4. DTS-tolerance	0.41	-0.38	-0.35	-----								
5. DTS-appraisal	0.35	-0.43	-0.33	0.57	-----							
6. DTS-absorption	0.41	-0.49	-0.42	0.74	0.65	-----						
7. DTS-regulation	0.26	-0.28	-0.34	0.53	0.45	0.49	-----					
8. FDS-DI	-0.48	0.46	0.40	-0.45	-0.33	-0.47	-0.32	-----				
9. FDS-E	-0.44	0.48	0.46	-0.45	-0.29	-0.45	-0.32	0.67	-----			
10. FDS-EI	-0.40	0.49	0.44	-0.60	-0.44	-0.61	-0.44	0.66	0.66	-----		
11. FDS-A	-0.23	0.40	0.38	-0.32	-0.20	-0.28	-0.20	0.45	0.60	0.61	-----	
12. DIS-DI	-0.09	0.08	0.07	-0.04	-0.03	-0.01	-0.10	0.08	0.03	0.06	-0.05	-----
13. DIS-DA	-0.31	0.24	0.24	-0.31	-0.26	-0.24	-0.38	0.29	0.23	0.26	0.15	0.29

Note. N=364-366. All correlations greater than |.15| are significant at p<.01. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

Table A9. Fit Indices for Tested Models, N=366

Model	q	χ^2	df	sig.	RMSEA	CFI	SRMR	BIC
One-factor model	49	164.60	41	<.001	0.09	0.95	0.04	-77.41
Multidimensional model	51	136.23	39	<.001	0.08	0.96	0.04	-93.97

Note. q=number of free parameters estimated in the model; χ^2=chi-square value; df=degrees of freedom; sig= significance of chi-square test; RMSEA = Root Mean Standard Error of Approximation; CFI = Comparative Fit Index; SRMR=Standardized Root Mean Square Residual; BIC=Bayesian Information Criterion

Table A10. Standardized Parameter Estimates for Multidimensional Model

Latent Factor/Subscale	Estimate	Std. Err.
Cognitive DT		
MSTAT-II	0.72	0.04
IUS-PA	-0.77	0.04
IUS-IA	-0.68	0.04
Emotional DT		
DTS-tolerance	0.71	0.04
DTS-appraisal	0.56	0.05
DTS-absorption	0.75	0.04
DTS-regulation	0.55	0.05
FDS-DI	-0.68	0.04
FDS-E	-0.67	0.04
FDS-EI	-0.80	0.03
FDS-A	-0.45	0.05

Note. N=366; all estimates are significant at p<.001. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance subscale; A=achievement

Table A11. Fit Indices for Multiple Group Analysis

Model	q	χ^2	df	sig.	RMSEA	CFI	SRMR	BIC	NCI
Form invariance	102	191.74	78	<.001	0.09	0.95	0.05	-214.60	0.732
Metric invariance	93	198.39	87	<.001	0.08	0.95	0.06	-254.84	0.736

Note. q=number of free parameters estimated in the model; χ^2=chi-square value; df=degrees of freedom; sig=significance of chi square test; RMSEA=Root Mean Standard Error of Approximation; CFI=Comparative Fit Index; SRMR=Standardized Root Mean Square Residual; BIC=Bayesian Information Criterion; NCI=McDonald's Non-centrality Index

Table A12. Convergent Correlations between Self- and Informant Ratings of DT

Variable	Sample Size	Correlation	Significance
MSTAT-II	60	0.36	0.003
IUS-PA	61	0.53	<.001
IUS-IA	61	0.51	<.001
DTS-tolerance	61	0.20	0.066
DTS-appraisal	61	0.43	0.001
DTS-absorption	61	0.27	0.019
DTS-regulation	61	0.20	0.066
FDS-DI	61	0.16	0.109
FDS-E	61	0.31	0.008
FDS-EI	61	0.28	0.016
FDS-A	61	0.35	0.003
DIS-DI	61	0.30	0.009
DIS-DA	61	0.27	0.017

Note. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS= Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA= inhibitory anxiety; DTS=Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI= discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA= discomfort avoidance

Table A13. Correlations between Maternal Responsiveness and Prenatal Covariates

Variable	Sample Size	Correlation	Two-tailed p-value
Distress tolerance	86	0.191	.078
Age	86	0.219	.043
Caucasian[a]	86	0.423	<.001
Married[b]	86	0.312	.003
Education level	86	0.334	.002
Income	84	0.241	.027
Employed[c]	86	-0.419	<.001
Number of children	86	-0.194	.074
Avoidant coping	86	-0.315	.003
Active coping	86	0.127	.243
NEO-FFI	86	-0.083	.445
LTE-Q	86	-0.177	.104

Note. LTE-Q=List of Threatening Experiences Questionnaire; [a]Dummy coded, 1=Caucasian, 0=non-Caucasian; [b]Dummy coded, 1=married, 0=non-married; [c]Dummy coded, 1=employed, 0=non-employed

Table A14. Comparison between Prenatal DT and Postpartum DT

	Prenatal DT		Postpartum DT		Comparison
Variable	Mean	SD	Mean	SD	Two-sample *t*-test
MSTAT-II	42.64	6.58	43.12	7.35	t(78)=-0.92, p=.362
IUS-PA	14.47	4.44	13.98	4.39	t(79)=1.60, p=.113
IUS-IA	10.64	3.37	10.37	3.47	t(79)=0.95, p=.343
DTS-toleration	3.75	0.88	3.87	0.80	t(79)=-1.28, p=.203
DTS-appraisal	4.09	0.72	3.99	0.73	t(79)=1.15, p=.252
DTS-absorption	3.82	0.95	3.78	0.98	t(79)=0.51, p=.609
DTS-regulation	3.60	0.92	3.70	0.87	t(79)=-1.14, p=.256
FDS-DI	14.73	4.27	14.30	4.30	t(79)=1.16, p=.250
FDS-E	18.94	4.32	17.86	5.46	t(79)=2.55, p=.013
FDS-EI	17.11	5.25	15.26	5.00	t(79)=4.18, p<.001
FDS-A	20.30	5.19	18.56	5.60	t(79)=3.65, p<.001
DIS-DI	4.85	2.53	4.43	2.92	t(79)=1.87, p=.066
DIS-DA	6.35	3.70	6.20	3.69	t(79)=0.38, p=.706

Note. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS=Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS= Distress Tolerance Scale; FDS=Frustration Discomfort Scale; DI= discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

APPENDIX B: FIGURES

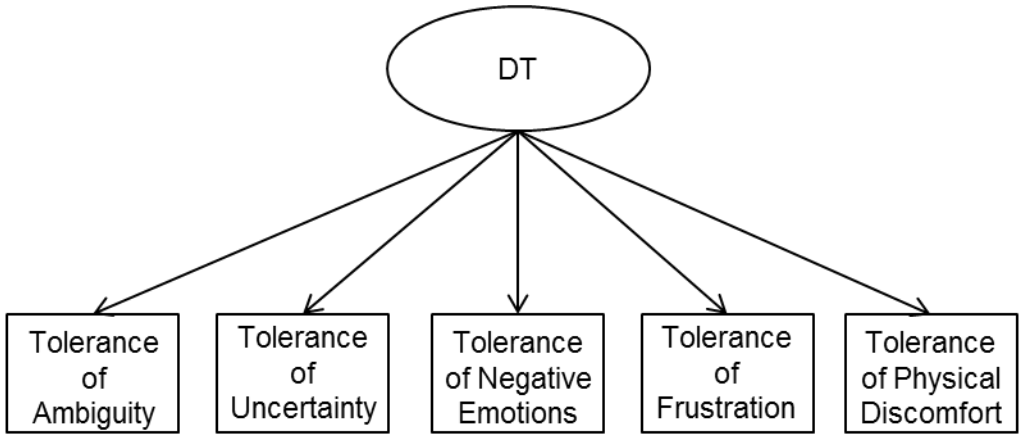

Figure B1. One-factor model of DT proposed by Zvolensky et al. (2010)

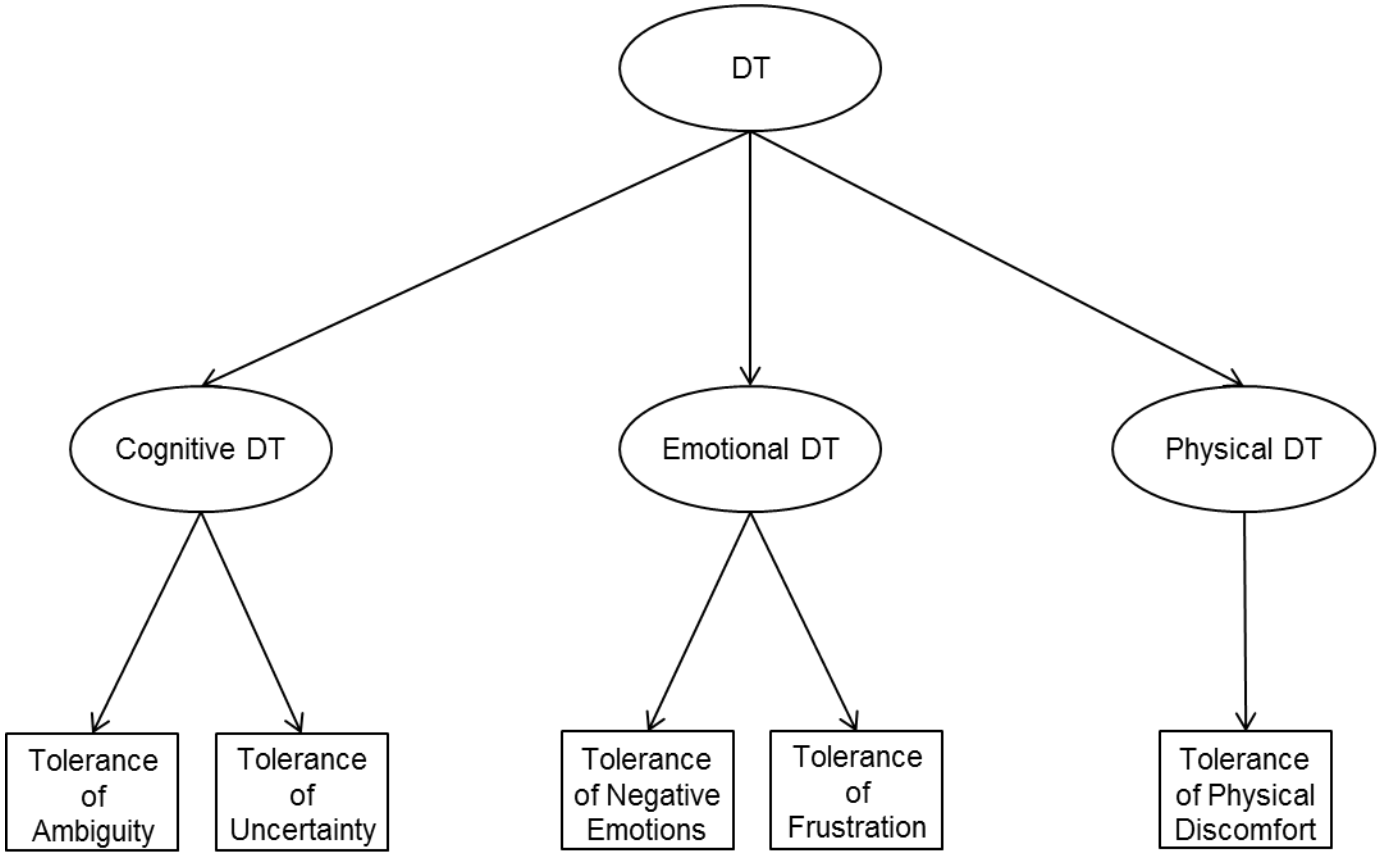

Figure B2. Multidimensional model of DT

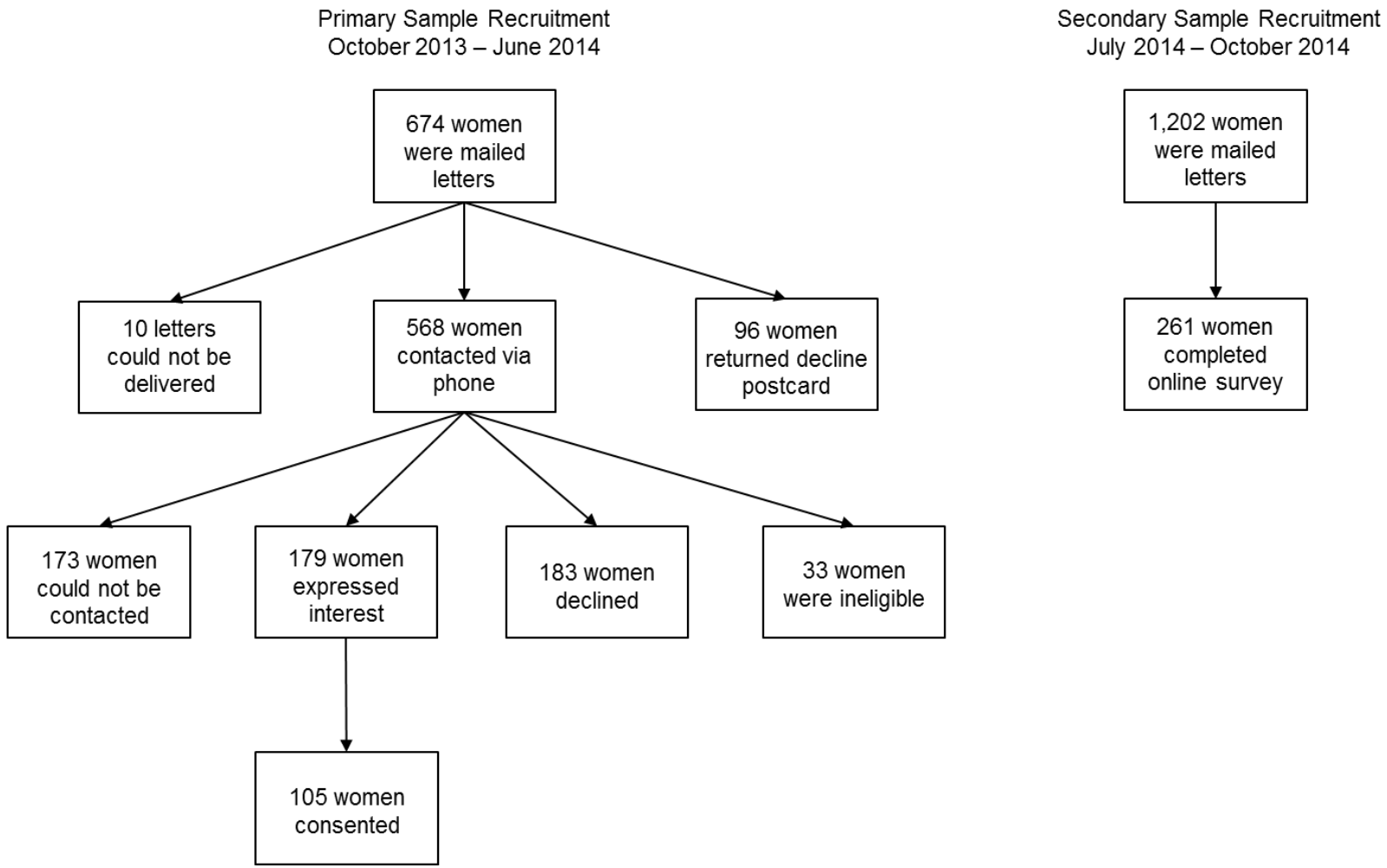

Figure B3. Flowchart of recruitment process

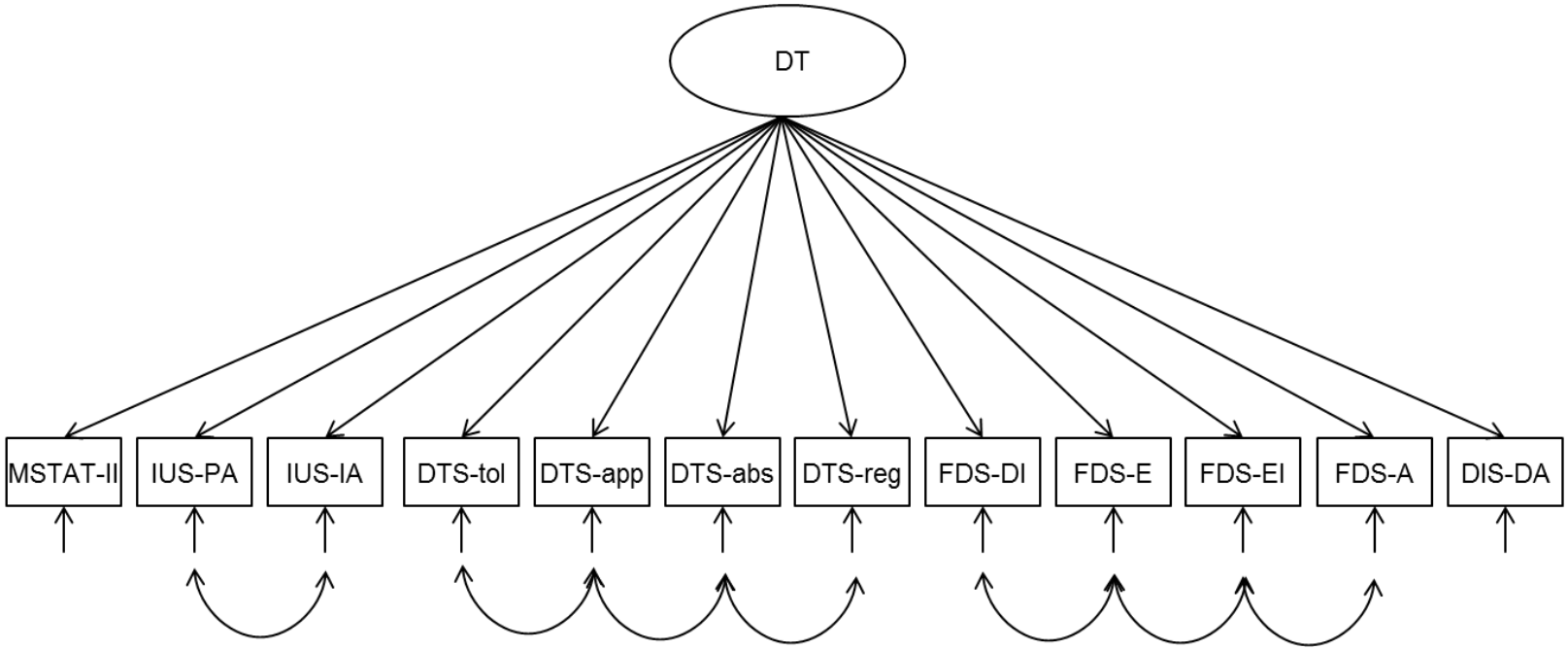

Figure B4. Specified one-factor model of prenatal DT. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS= Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS= Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

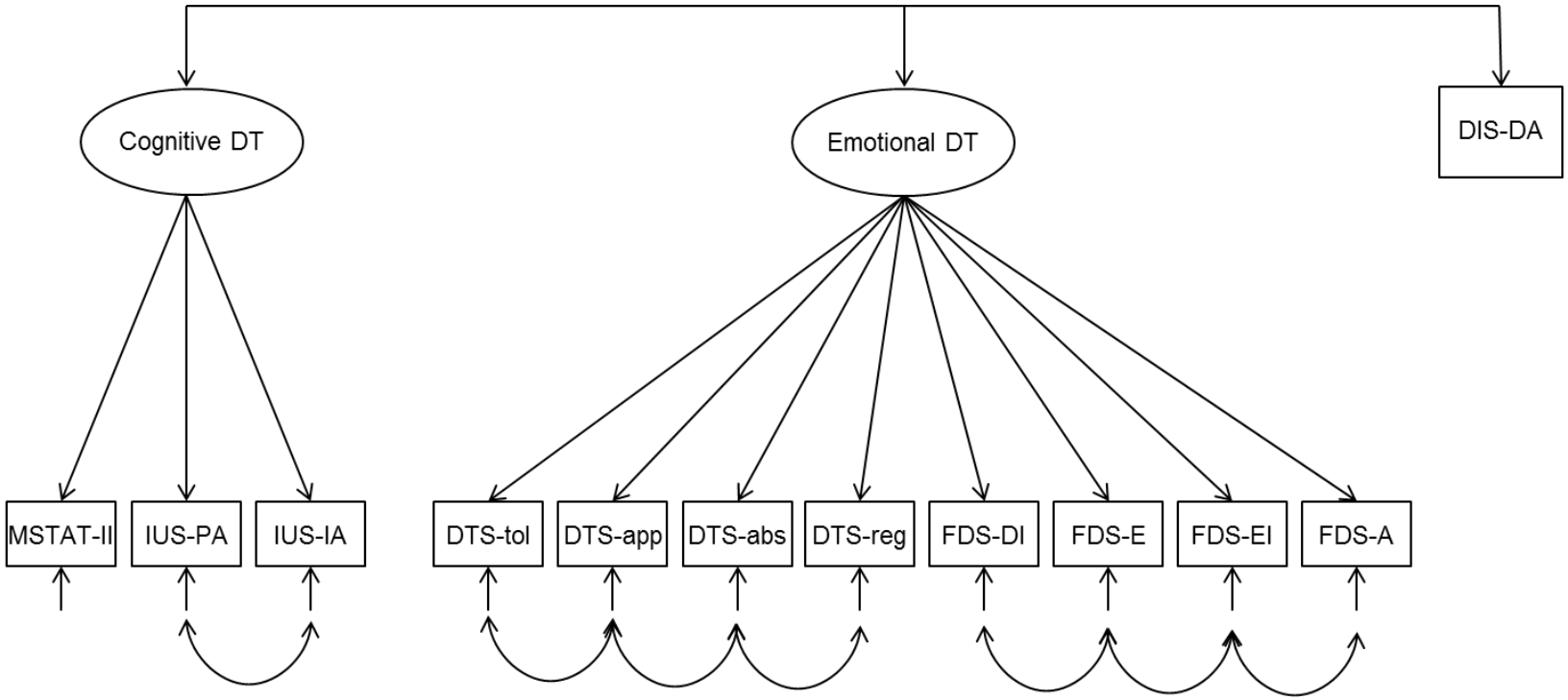

Figure B5. Specified multifactor model of prenatal DT. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS= Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS=Distress Tolerance Scale; FDS= Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI=emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

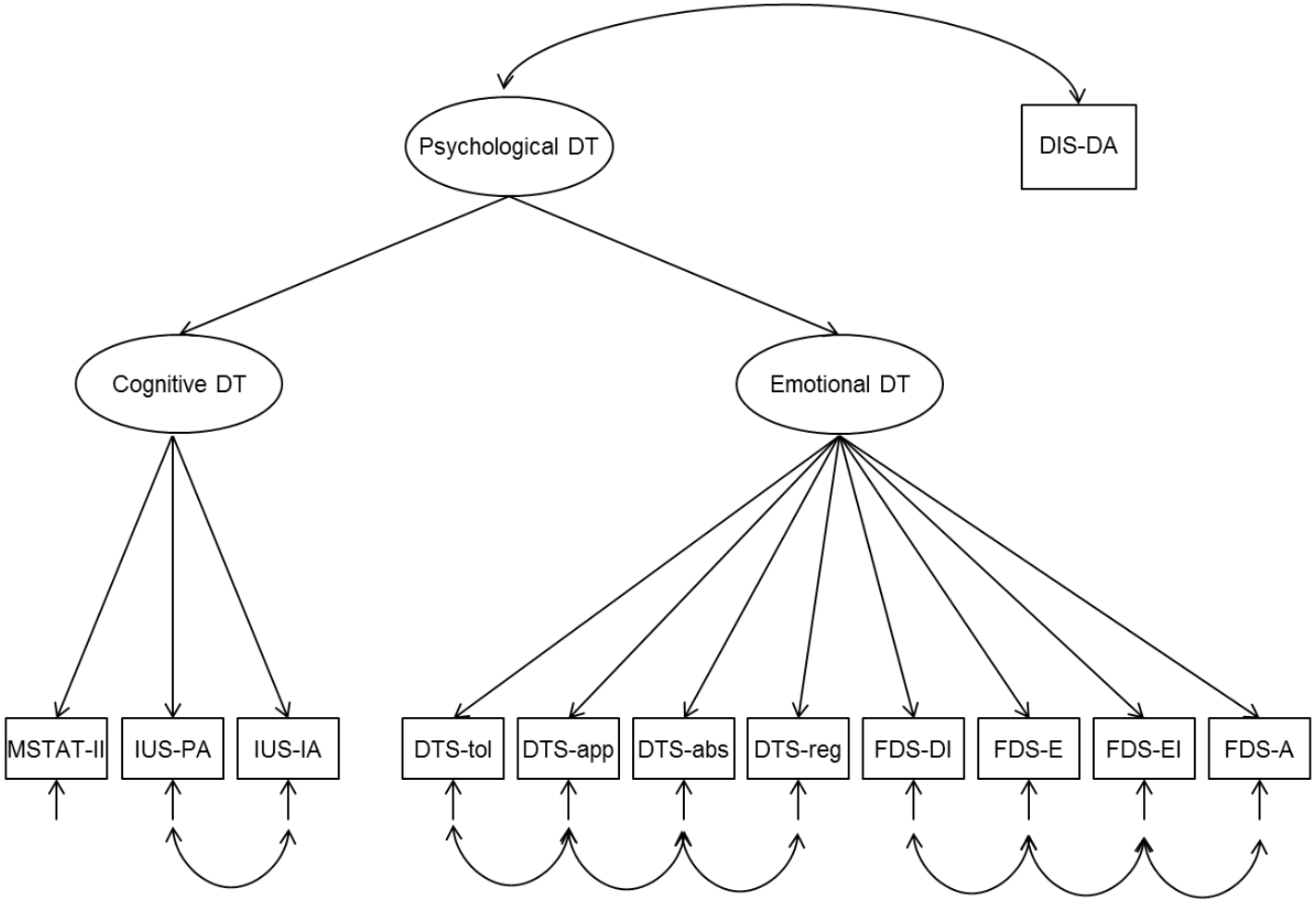

Figure B6. Specified higher-order model of prenatal DT. MSTAT-II= Multiple Stimulus Types Ambiguity Tolerance Scale-II; IUS= Intolerance of Uncertainty Scale-Short Form; PA=prospective anxiety; IA=inhibitory anxiety; DTS= Distress Tolerance Scale; FDS= Frustration Discomfort Scale; DI=discomfort intolerance; E=entitlement; EI= emotional intolerance; A=achievement; DIS=Discomfort Intolerance Scale; DA=discomfort avoidance

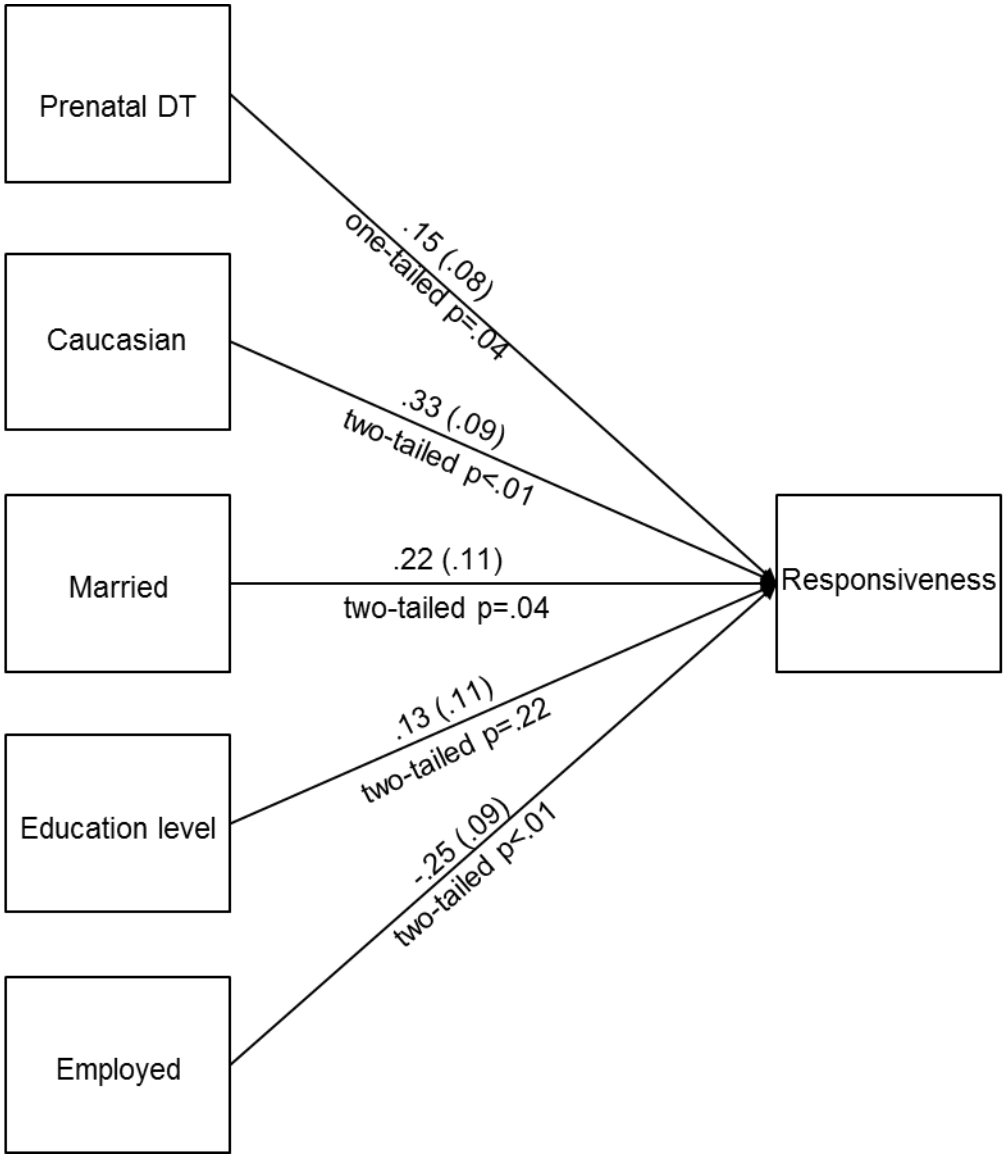

Figure B7. Standardized parameter estimates for the model of maternal responsiveness with prenatal DT and demographics. Standard errors are reported in parentheses. Dummy coded variables are as follows: 1=Caucasian, 0=non-Caucasian; 1=married, 0=non-married; 1=employed, 0=non-employed

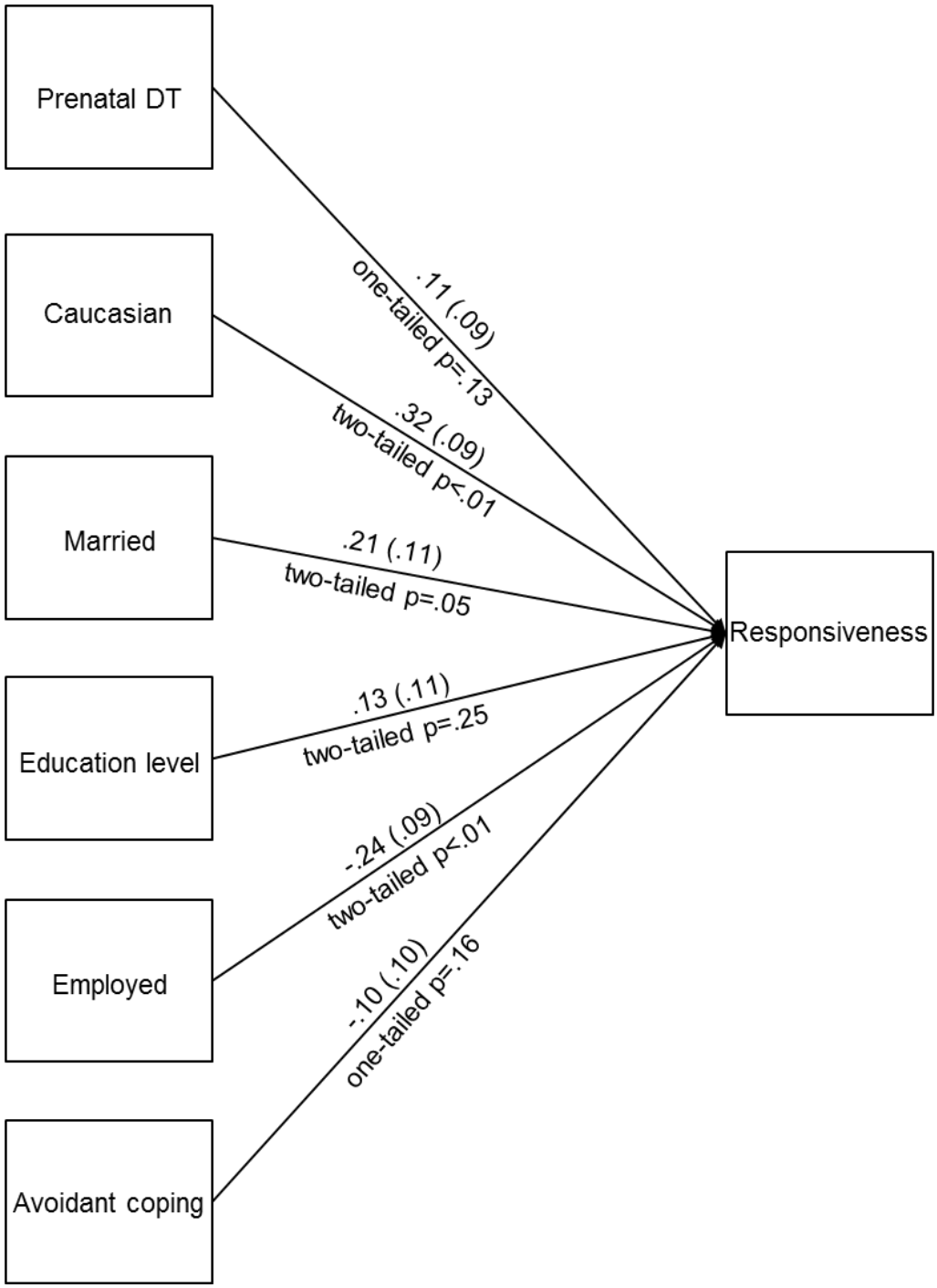

Figure B8. Standardized parameter estimates for the model of maternal responsiveness with prenatal DT, demographics and avoidant coping. Standard errors are reported in parentheses. Dummy coded variables are as follows: 1=Caucasian, 0=non-Caucasian; 1=married, 0=non-married; 1=employed, 0=non-employed

APPENDIX C: MATERNAL RESPONSIVENESS CODING SYSTEM

Parental Responsiveness - Global Coding

Each paradigm is coded for the parent's responsiveness along the global conditions described below. **One overall rating** (1-7) is given based upon three scales of global responsiveness: Sensitivity/Insensitivity, Cooperation/Interference, and Acceptance/Rejection. Generally, high scores are given when the parent's behavior is likely to please the child.

Sensitivity – Insensitivity

This scale describes the amount and quality of the attention a parent gives her/his child. It refers to how aware the parent is of the child's needs/feelings/whereabouts, and how promptly and appropriately the parent responds to the child's cues or signals. It also involves the extent to which the child's needs are met by the parent.

Cooperation-Interference

This scale describes a parent's respect for the child as an autonomous individual with his/her own wishes and desires. Although a child's wishes and desires must not be always abided, a cooperative parent allows the child a **moderate amount of autonomy, appropriate to the circumstances.** The extent of how controlling the parent appears, either **physically or emotionally**, is a determinant of a parent's score on this scale.

Acceptance-Rejection

This scale describes how **genuine versus perfunctory a parent's enjoyment and interest is** when interacting with the child. It also describes how much attention the parent gives to competing concerns when interacting with the child. Third, it describes how much the parent seems to enjoy his/her interactions with the child.

7 (Highly Responsive)

The highly sensitive parent is one who is very aware of the child and his/her needs. When the child signals for attention, parent acts promptly and appropriately to attend to the child, correctly interpreting the child's signal. The highly sensitive parent is continually "in tune" with the situation surrounding the child, perceives the possibility of trouble, and redirects the situation appropriately. Parent has an "emotional presence" with the child. Offers attention spontaneously, even if the child does not solicit it.

A highly sensitive parent:

- Consistently watches to make sure the child is O.K.
- Always quickly and appropriately responds to child's verbal and nonverbal bids (sneezes, falling down, etc).
- Can and does anticipate child's needs without interfering or hindering child's autonomy.
- Is capable of engaging child, and uses this ability to make tasks more enjoyable (specific to the task at hand)
- Senses and perceives things that the child enjoys or wants (such as tickling, singing, etc.), and responds appropriately.
- Validates child's wants and desires even if he or she ultimately needs to restrict the child's behavior.
- ALWAYS understands child=s signals/verbalizations and responds appropriately.
- Definitely has an *emotional presence* with his/her child throughout paradigm; is *in tune* with child.
- Offers much spontaneous attention to the child, in line with the task of the paradigm.

The highly cooperative parent is one who acknowledges that the child is an autonomous person, deserving of respect as an individual.

A highly cooperative parent:

- Modifies agenda during activities, especially those which require competitive attention (i.e. Mom busy with questionnaires), based on cues from child.
- Follows child's lead whenever appropriate to do so.
- When child engages in exploratory behavior, encourages this behavior when not inappropriate or dangerous.
- Does not use direct commands, but gives the child ideas instead.

The highly accepting parent is one who displays a very genuine interest in the child and seems to genuinely enjoy interacting with him or her. The child is not a cause of frustration. His/Her acceptance of the child is evident and unwavering. Parent appears to have a good time with the child, even when things do not go smoothly or harmoniously.

A highly accepting parent:

- Appears to truly be having fun when interacting with child (laughs, smiles).
- Verbally and affectively, does not seem express frustration when things do not go well or child is uncooperative.
- Appropriately (firmly) corrects behavior when necessary, but this does not linger.
- Often makes positive comments about the child's behaviors that indicate an accepting attitude.
- Transfers his/her excitement, affection, and/or love and enthusiasm to the child.

6 (Responsive)

The sensitive parent is one who is often aware of the child and his/her needs but doesn't anticipate his/her needs. When the child signals for attention, parent acts relatively promptly and appropriately to attend to the child, correctly interpreting the child's signal. The sensitive parent is often "in tune" with the situation surrounding the child. Most of the time parent can perceive the possibility of trouble and redirect the situation appropriately. Most of the time parent has an "emotional presence" with his/her child. Sometimes parent offers attention spontaneously, even if the child does not solicit it.

A sensitive parent:

- Frequently watches to be sure the child is O.K.
- Frequently is prompt in responding to the child's bids.
- Frequently interacts with child
- Often senses and perceives things that the child enjoys or wants (such as tickling, singing, etc.), and responds appropriately.
- Sometimes validates the child's wants and desires even if he/she ultimately needs to restrict the child's behavior.

The cooperative parent is one who sometimes acknowledges that the child is an autonomous person, deserving of respect as an individual. The parent sometimes considers the child's desires and feelings, within reasonable limits.

A cooperative parent:

- Frequently modifies agenda during activities based on cues from child.
- Allows for significantly more cooperation than interference.
- When it is necessary to physically redirect the child, does so in a gentle and guiding way.

The accepting parent is one who, most of the time, displays a genuine interest in his/her child and seems to genuinely enjoy interacting with him or her. Parent does not appear to get frustrated easily by child. Parent appears to have a good time with the child most of the time.

An accepting parent:

- Appears to enjoy interacting with the child (some positive affect must be present).
- Does not express frustration when things do not go well or child is uncooperative (verbally and/or affectively).
- Often makes positive comments about the child's behavior that indicate an accepting attitude (a large percentage of comments made are positive to/about the child).

5 (Somewhat Responsive)

A somewhat responsive parent is one who sometimes has an emotional presence with the child and appears to be "in tune" some of the time.

A sensitive parent:

- Tends to respond to the child's verbal cues but not to his or her non-verbal (e.g., physiological) cues.
- May respond to child but does not give spontaneous attention
- Does not always respond appropriately (includes "automated" responses, such as "really", "uh-huh", etc).

A cooperative parent:

- A little more cooperation than interference
- Open-ended commands
- Allows child to take some of the lead within the limits of the set agenda
- Allows, but may not encourage, exploratory behavior.

A somewhat accepting parent is generally content to be with the child, although may not express this overtly as much as more accepting parents.

An accepting parent:

- Is having a little more fun than if was alone.
- Expresses warmth in majority of interactions with child.
- Expresses little to no frustration, and if displayed it is only at appropriate times.
- Makes genuine positive comments to/about the child.

X THERE IS NO FOUR

3 (Somewhat Unresponsive)

The insensitive (fair) parent is one who is sometimes unaware of the child and his/her needs. When the child signals for attention, parent acts relatively slowly and often inappropriately to attend to the infant, sometimes misinterpreting the child's signal. The insensitive parent is not really "in tune" with the situation surrounding the child. Sometimes parent can perceive the possibility of trouble and redirect the situation appropriately, but not usually. Often does not have an "emotional presence" with his/her child.

A somewhat insensitive parent:

- May inconsistently watch to make sure the child is O.K.
- Slowly responds to child's bids.
- Rarely talking to child.
- Doesn't respond to child's overt non-verbal (e.g., physiological) cues.
- May often respond but often not appropriately.
- If parent consistently watches child, does so in a neutral/non-interactive manner.

The interfering parent does not appear to have much respect for the child's individuality or autonomy. Oftentimes, the parent's agenda takes precedence, although he or she may deviate from it occasionally. Interference may also take the form of physical interference with the child's activities, either by physically redirecting the child's behavior or by reorganizing the situation, without concern for the child's preference.

An interfering parent:

- Often chooses toys/ games, despite cues from child that he/she is not interested.
- Often restricts child's exploratory behavior when it does not comply with the PARENT'S agenda (not the task agenda, such as cleanup).
- Uses many direct commands
- Somewhat equal amounts of cooperation and interference
- Does not follow child's lead
- May seldom modify agenda
- Sometimes allows exploratory behavior, even when this behavior is marginally inappropriate or dangerous.
- When physically redirecting child, may do so in a controlling manner.

The rejecting parent appears to be wishing to be somewhere else at least for part of the time. Parent does not show enthusiasm and may be easily frustrated by the child or impatient with the child.

A rejecting parent:

- Does not appear to be having a good time with the child (flat/neutral affect).
- Sometimes even positive verbal statements may be made in a tone indicating disapproval or negative affect.
- Gets mildly upset, impatient, and/or irritable when child becomes difficult, unenjoyable, or less cooperative.
- Would have as much fun if alone.
- Rarely makes genuine positive comments to/about child.

2 (Unresponsive)

An insensitive parent:

- Discounts the child's bids
- Not "in tune" to child's situation, wants, desires, etc.
- Doesn't make an effort to choose things that the child wants.
- Rarely monitors child's whereabouts.
- Doesn't validate child's wants and desires when restricting behavior.

An interfering parent:

- Seldom follows child's lead
- Uses more interference than cooperation.
- Allows for very inappropriate/a lot of inappropriate behavior.
- Shows little regard for child's preferences (when child shows clear preference).
- When physically redirecting child, may do so in a harsh manner.
- Parent's agenda takes precedence.

A rejecting parent:

- Would be happier if alone.
- Is often critical of his/her child, and may make critical or rejecting comments directly to child.
- May show frustration or impatience, even when not warranted.
- Appears disinterested in child.
- Would have more fun if alone.

1 (Highly Unresponsive)

The highly insensitive parent is not concerned as much with the situation of the child as with his/her own situation and agenda. If parent responds to the signals of the child, is likely to do so in a way inconsistent and inappropriate to the meaning of the child's signal.

A highly insensitive parent:

- Is more likely to respond to the negative behaviors when the child displays both positive and negative behaviors.
- Pays little to no attention to the child when involved in other activities, little monitoring of whereabouts.
- Often does not respond verbally or otherwise to child's cues (both verbal and nonverbal cues). More often response time is really slow.
- Is unresponsive and uninvolved during activities, does not attempt to make activities "fun"

The highly interfering parent does not appear to have any respect for his/her child's individuality or autonomy. Oftentimes, the parent's agenda takes precedence, and is the only acceptable agenda to follow. The highly interfering parent allows little deviation from the own agenda or plan. Interference may also take the form of physical interference with the child's activities, either by physically redirecting the child's behavior or by reorganizing the situation, without concern for the child's preference.

A highly interfering parent:

- Always chooses toys/ games, despite cues from child that he/she is not interested.
- Shows no desire to modify agenda, even during play.
- Completes tasks with little regard for child's preferences. May put food in child's mouth before he/she seems ready, or delay until parent is ready.
- Is quick to restrict child's exploratory behavior when it does not comply with his/her agenda.
- Discounts child's desires.
- Treats child like an inanimate object (i.e., physically moves child's limb to perform the behavior desired by the parent when unnecessary).

The highly rejecting parent appears to be wishing to be somewhere else. He or she does not show enthusiasm and is easily frustrated by his/her child.

A highly rejecting parent:

- Is easily upset, impatient, and/or irritable when child becomes difficult, unenjoyable, or less cooperative. May make verbal statements indicating disapproval of child, and may direct them to the child.
- Ignores child, or sighs in a way that indicates he or she is not interested in the child, or is frustrated with interactions with him/ her.
- Shows high frustration/impatience.