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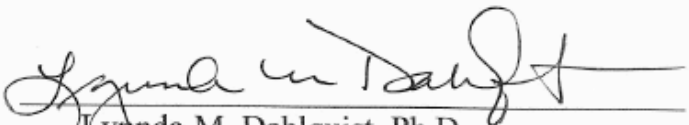
Thesis and Abstract Approved: 

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ABSTRACT

Title of Document: MATERNAL EMOTION SOCIALIZATION IN HEALTHY CHILDREN AND CHILDREN WITH FOOD ALLERGIES

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Mothers caring for children with food allergies face additional stress, anxiety, and parental responsibility for a child at constant risk of allergic exposure. The present study examined how maternal anxiety and protective parenting relate to mothers' supportive and nonsupportive responses to their children's emotions. Observational and self-report data were collected from 132 mother-child dyads, including 65 children with diagnosed food allergies and 67 healthy children, ages 3 to 6 years old. Protective parenting, state anxiety, and trait anxiety predicted differences in how mothers of children with food allergies responded to their children's emotions. In particular, mothers in the food allergy group were less likely to issue supportive responses and more likely to issue nonsupportive responses to children's positive and internalizing affect than mothers of healthy children. This is the first study to demonstrate that parents may respond differently to medically vulnerable children's emotions.

MATERNAL EMOTION SOCIALIZATION IN HEALTY CHILDREN AND CHILDREN WITH FOOD ALLERGIES.

By

Naomi J. Parr

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County, in partial fulfillment
of the requirements for the degree of
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Dedication

I dedicate this thesis to my beloved Hayden and Harley. They will never read this or even understand what a ‘thesis’ means, but nonetheless I am thankful for the many hours that they spent at my side while I worked. To me, there is no greater peace than that which comes from the care and company of wild animals. I hope that generations to come will be able to enjoy all the biodiversity and natural beauty that our wild animals have to offer us. May we protect them like we protect our children.

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Finally, I am profoundly grateful to my parents, Margaret and Ted Parr—for raising me with love and acceptance—and to my fiancé, Spencer Millen—for absolutely everything, נשמה שלי.

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Chapter 1: Background

Introduction

Childhood chronic illness can be a substantial burden on families and may impact the way in which caregivers interact with their ailing children (Cousino & Hazen, 2013; Pinquart, 2013; Silva, Carona, Crespo, & Canavarro, 2015). Given recent recognition of childhood food allergy as a chronic condition with significant caregiver burden (Friedman & Morris, 2006), there is new demand for an examination of parent-child interactions within the context of one of the most prevalent chronic illnesses of early childhood worldwide (Prescott et al., 2013; Savage & Johns, 2015). Food allergies typically emerge in infancy to early childhood, leaving responsibility for management of the condition to the parents (King, Knibb, & Hourihane, 2009; Savage & Johns, 2015; Walkner, Warren, & Gupta, 2015). Within families facing childhood food allergies, mothers report having the greatest share in caregiving responsibilities and the heaviest psychosocial burden (King et al., 2009; LeBovidge, Strauch, Kalish, & Schneider, 2009; Mandell, Curtis, Gold, & Hardie, 2005).

Relative to mothers of healthy children, mothers of children with food allergies describe having (a) more daily life stress and emotional difficulty (Bollinger et al., 2006; Gillespie, Woodgate, Chalmers, & Watson, 2007; Williams, Parra, & Elkin, 2009), (b) poorer quality of life (King et al., 2009; Sicherer, Noone, & Muñoz-Furlong, 2001), (c) more numerous symptoms of anxiety (Ackerman, 2009; Manassis, 2012), and (d) a greater likelihood of having been diagnosed with an anxiety disorder

(Lau et al., 2014). Taken together, these studies indicate that mothers caring for children with food allergies experience considerable burden; however, the degree to which this burden impacts mother-child interactions requires further study.

The present study aims to examine how mothers respond to the emotions expressed by healthy children and children with food allergies. An additional goal includes clarification of the roles of maternal anxiety and protective parenting. Selective reinforcement and punishment of children's affective displays is believed to be one way in which parents shape their children's emotional development, a process referred to in the literature as *emotion socialization* (Eisenberg, Cumberland, & Spinrad, 1998; Ellis, Alisic, Reiss, Dishion, & Fisher, 2014). Parental responses to particular emotions have been studied extensively (Chaplin, Casey, Sinha, & Mayes, 2010; Eisenberg, Fabes, & Murphy, 1996); however, this topic has received little attention within the context of childhood chronic illness.

The present study addresses a gap in the literature by examining maternal emotion socialization within the context of childhood food allergy. To that end, 132 children (65 with food allergies and 67 healthy children) ages 3 – 6 and their mothers completed an observational task that was video recorded as part of a larger study of childhood food allergies. For the present study, videos were coded for children's affective displays and mothers' emotion-related socialization behaviors. These coding systems and other methods are described in more detail in Chapter 2.

Childhood Food Allergy

Food allergy is a potentially life-threatening condition that affects primarily young children and infants (Savage & Johns, 2015). It is characterized by an ongoing

sensitivity to proteins found in one or more foods that upon exposure produces a dangerous IgE-mediated systemic immune response. Symptoms of an allergic reaction include urticaria (hives), itchiness, running nose, and edema (swelling) of the face and extremities. In more severe reactions, called "anaphylaxis," swelling of the tongue and throat can interfere with breathing or swallowing, causing shortness of breath, vomiting, lightheadedness, and a dangerous drop in blood pressure (i.e., anaphylactic shock). The incidence of anaphylactic reactions has been increasing in recent years (Simons, 2010), and may account for an estimated 10,000 emergency department visits and 150-200 deaths per year in the United States (Bock, Munoz-Furlong, & Sampson; 2001; Gaeta, Clark, Pelletier, & Camargo, 2007).

Food allergies represent a growing concern in the public health and pediatric psychology literature. An estimated four million (5.4%) American children under the age of 18 years reported living with one or more food allergies in the year 2014 (National Center for Health Statistics [NCHS], 2014), and prevalence increased by almost 2% in the last decade (Jackson, Howie, & Akinbami, 2013; Savage & Johns, 2015). Food allergy is typically diagnosed in early childhood and is slightly more prevalent among children below three years of age than among older children (Sicherer & Sampson, 2014). It is considered to be a chronic illness because it persists for longer than three months—though in many cases it resolves spontaneously during adolescence or adulthood—and cannot be cured with the treatments currently available (Friedman & Morris, 2006). Food allergies must therefore be managed through a combination of food restriction and emergency administration of

antihistamines, steroids, and epinephrine in the event of accidental allergen exposure (DunnGalvin & Hourihane, 2009; Sicherer et al., 2001).

Preventing exposure to food allergens can be a difficult task for many caregivers. Allergens used as ingredients in other food items may be improperly labeled or listed under an unfamiliar name on food labels (Munoz-Furlong, 2003; Savage & Johns, 2015). Caregivers must become adept at label reading; however, in a study of 91 families given a label reading task, less than 10% of those avoiding milk protein were able to identify alternate names (e.g., casein, ghee), only 22% of those avoiding soy protein could identify pseudonyms, and about 54% of those avoiding peanuts could identify peanut ingredients (Joshi, Mofidi, & Sicherer, 2002). Caregivers must become familiar with a variety of scientific names for foods, remember to read labels each time they purchase or serve food products, contact manufacturers when labels are unclear, and discuss their children's dietary needs with others—all of which can be time-consuming tasks (Munoz-Furlong, 2003).

Exposure may also occur due to cross-contamination of "safe" foods or environments with allergen-containing products (Simons, 2010). Most acute allergic reactions occur outside of the home in environments that caregivers cannot control (Bock et al., 2001). Unsurprisingly, some mothers describe difficulty relinquishing control to other caregivers, including teachers, relatives, and other children's parents (Gillespie et al., 2007; Rouf, White, & Evans, 2012). Some caregivers opt for homeschooling in an attempt to reduce the risk of exposure outside the home (Bollinger et al., 2006; Rouf et al., 2012).

Several have investigated the psychosocial burden of childhood food allergies on families (Bollinger et al., 2006; King et al., 2009; Lau et al., 2014). Among 87 families surveyed by Bollinger and colleagues (2006), more than 60% of caregivers reported that their child's food allergy affected daily meal preparation, 49% reported interference with family social activities, 41% reported an impact on daily stress levels, and 34% reported allergy-related problems with school attendance. Similarly, King and colleagues (2009) obtained reports of poorer health-related and school-related quality of life (QoL) for afflicted children and elevated stress and anxiety among caregivers, particularly mothers.

Caregiver Anxiety

Studies have shown that mothers caring for children with food allergies may have more symptoms of anxiety and be more likely to meet criteria for an anxiety disorder, relative to mothers of healthy children (Ackerman, 2009; Manassis, 2012; Lau et al., 2014). Given this association, it is important to examine how caregiver anxiety and childhood food allergy interact. In adults, anxiety typically presents with persistent fears about future negative events coupled with cognitions about one's inability to predict or control negative outcomes (Barlow, 2014). This prompts increasing, but ultimately unsuccessful attempts to prevent undesirable outcomes through excessive worrying, planning, or behavioral avoidance. Many adults with anxiety develop an "intolerance of uncertainty" and become increasingly distressed by unpredictable or ambiguous events, given an inability to avoid them (Barlow, 2014; Buhr & Dugas, 2006; Fergus & Valentiner, 2011).

Anxiety may also be accompanied by a blunted physical stress response, including physiological and cardiovascular hyporeactivity to immediate stressors and poorer stress recovery (Chida & Hamer, 2008; Staufenbiel et al., 2013). Among individuals experiencing chronic stress, physiological hyporeactivity to acute stressors is thought to indicate that the mechanisms underlying the stress response have been exhausted (e.g., hypocortisolism). The above findings suggest that individuals with persistent anxiety may also experience a similar exhaustion of resources resultant in blunted stress reactivity (Chida & Hamar, 2008). With support from the neuroendocrinology literature, it appears that anxiety is associated with both acute stress (e.g., sudden trauma) and prolonged stress (e.g., daily life hassles) (Pêgo, Sousa, Almeida, & Sousa, 2010).

The anxiety literature often makes a distinction between state and trait anxiety. State anxiety refers to worry, tension, and autonomic arousal experienced temporarily when confronted with stimuli perceived to be dangerous; whereas, trait anxiety reflects an enduring dispositional tendency to feel worried or apprehensive (Spielberger, Gorsuch, & Lushene, 1983). Trait anxiety is often associated with risk for anxiety disorders, while state anxiety is more predictive of current functioning (Grupe & Nitschke, 2013; Hishinuma et al., 2001). In the health psychology literature, it is common practice to assess trait anxiety among adult caregivers (Elliott, Shewchuk, & Richards, 2001); however, many investigators elect to measure both constructs concurrently (e.g., King et al., 2009; Lau et al., 2014).

In the food allergy literature, both state and trait anxiety appear to be elevated among mothers (King et al., 2009; Lau et al., 2014). King and colleagues (2009)

found that mothers caring for children ages 8-12 with peanut allergies exhibit higher state anxiety relative to fathers and higher trait anxiety relative to both fathers and population norms. In another study involving mothers and children with food allergies, Lau and colleagues (2014) observed higher maternal state and trait anxiety relative to mothers with healthy children. The self-reported impact of childhood food allergies on mothers' daily life was strongly associated with both state and trait anxiety and did not differ by years since diagnosis. Taken together, these studies indicate that it may be appropriate to assess both maternal state and trait anxiety in mothers caring for children with food allergies.

Among parents caregiving for children with other chronic illnesses, stress and anxiety are common experiences (Coffey, 2006; Easter, Sharpe, & Hunt, 2015; Nabors et al., 2013). Caregivers for children with a number of chronic illnesses report significantly more parenting stress than parents of healthy children; moreover, evidence suggests that greater parenting stress is associated with greater responsibility for treatment management (Cousino & Hazen, 2013). Trends in the food allergy literature seem to support these findings (e.g., Manassis, 2012; Lau et al., 2014); however, most studies have examined maternal stress and anxiety among parents caring for older pediatric patients (ages 8-16) with food allergies. To date, no study has examined anxiety among mothers caring for younger children (< 8 years) with food allergies. Given that food allergies tend to emerge in early childhood (Savage & Johns, 2015), inclusion of younger participants and their mothers is likely to produce more generalizable results.

Given the relatively higher incidence of anxiety among mothers with food allergies (Ackerman, 2009; Manassis, 2012; Lau et al., 2014), there is evidence to suggest that aspects of caring for a child with food allergies may reinforce anxious behavior (Manassis, 2012; Lau et al., 2014). For example, preventing allergen exposure may necessitate a greater degree of awareness and avoidance in food-related situations than would be adaptive for healthy individuals and their caregivers (DunnGalvin & Hourihane, 2009; Sicherer et al., 2001). Indeed, medical practitioners recommend vigilance when purchasing food products (e.g., label reading) and planful control over both diet and environment (DunnGalvin & Hourihane, 2009; Walkner et al., 2015). The qualitative literature indicates that mothers may have difficulty with these tasks, particularly in ambiguous or unfamiliar food environments such as at restaurants, schools, or in others' homes (Gillespie et al., 2007; Mandell et al., 2005).

When the first line of treatment is to identify and avoid hidden allergens, caregivers may begin to perceive risk in a variety of foods and situations. In the adult literature, there is an association between diet-related chronic health conditions (DRCHCs) and unnecessary dietary restriction (Quick, Byrd-Bredbenner, & Neumark-Sztainer, 2013), which could reflect overgeneralization of avoidance behavior. Among children, an exploratory study of food allergy and diet restriction found that children with food allergies had more symptoms of food neophobia than their non-allergic siblings (Rigal, Reiter, De Boissieu, & Dupont, 2005); however, similar studies yielded conflicting results (Maslin et al., 2016), which may be due in part to the fact that many children do not plan their own meals and therefore do not consistently engage in avoidance behavior. Instead, parents typically assume this

responsibility and unsurprisingly tend to report more emotional distress associated with meal planning (Walkner et al., 2015).

Another facet of food allergy likely to promote anxiety is the increased likelihood and alarming nature of anaphylaxis. Adults with anxiety are already susceptible to catastrophic appraisals of future events (Barlow, 2014). Anaphylactic episodes can be traumatic and though death from an acute allergic reaction is rare (Simons, 2010), it might understandably become the focus of caregivers' catastrophic cognitions. Though history of anaphylaxis and catastrophizing have not yet been studied directly, there is evidence of an association between number of previous anaphylactic episodes and increased maternal state anxiety (Lau et al., 2014). Mothers who have witnessed one or more anaphylactic episodes are also more likely to interpret their children's symptoms as more severe and to rate their quality of life as poorer than the children themselves (Chow, Pincus, & Comer, 2015; King et al., 2009; LeBovidge et al., 2009).

Food allergy is therefore unique in that it involves both elevated stress that pervades caregivers' daily life and the potential for acute trauma (i.e., acute allergic reaction or anaphylaxis). Qualitative studies of mothers' experiences caring for children with food allergies note a general theme of risk management and the emotional toll of "living with risk" of anaphylaxis (Gillespie et al., 2007; Mandell et al., 2005). It is therefore not surprising that a condition that necessitates constant vigilance, continuous risk appraisal, and avoidance of negative or catastrophic outcomes (i.e., allergic reaction or anaphylaxis) might be difficult for caregivers with

the intolerance of uncertainty, catastrophizing, and stress reactivity characteristic of anxiety.

Caregiver Protectiveness

In addition to its association with anxiety, parental caregiving is also frequently associated with protective parenting—the process through which parents exert control over their children's exposure to stressful or harmful events (Power, 2004). Providing children with some degree of protection is arguably the role of any parent and thus is thought to be primarily adaptive. Common protective behaviors include direct efforts to prevent harmful exposures, withholding information about potentially distressing subjects, placing limits on children's independent behaviors, supervision or monitoring, and promotion of positive alternatives to perceived risk behavior (Power, 2004).

However, when excessive, parental efforts to protect or control their children's stressful exposure may actually be counterproductive. Children who do not have sufficient opportunity to experience stress (and to adapt) may not develop independent coping skills and may become dependent upon their parents for affective regulation (Kiel & Buss, 2014; Power, 2004; Rubin, Burgess, & Hastings, 2002). This is thought to interfere with children's development of autonomy, particularly when parental protection extends to situations where it is not warranted. Thus, the construct of *over*protective parenting is used to refer protective behavior that no longer reflects normative or adaptive efforts to care for a child (Hardy et al., 1993; Herbert & Dahlquist, 2008; Pinquart, 2013). Overprotective parents may be characterized by hypervigilance, intrusiveness, and/or excessive restriction, often concurrent with

symptoms of anxiety (Allen et al., 2004; Clarke, Cooper, & Creswell, 2013; Pinquart, 2013).

In pediatric populations, protective parenting that exceeds the child's medical or developmental needs may manifest as excessive concern for the child's wellbeing, perception of the child as more vulnerable than medically indicated, anxiety about the parenting role, and excessive control over the child's activities (Allen et al., 2004; Holmbeck et al., 2002; Mullins et al., 2007). For example, among parents of children with asthma, parents who perceive their children as more vulnerable—regardless of symptom severity—are more likely to make use of preventative medications and to keep their children home from school (Spurrier et al., 2000). The same phenomenon has been observed in the food allergy literature as well (Chow et al., 2015; Herbert & Dahlquist, 2008; Manassis, 2012). Interestingly, parental protection may also extend to innocuous or otherwise non-threatening situations. In a study by Dahlquist and colleagues (2014), mothers watched their children with or without food allergy complete a puzzle task. Mothers of younger children (3-4 years) with food allergies provided more unnecessary help and their children made more indirect requests for help than their healthy counterparts.

In a recent meta-analysis, researchers observed higher levels of overprotection and demandingness and lower levels of emotional warmth in families with a child with chronic illness than in those with healthy children (Pinquart, 2013). Effect sizes varied by chronic illness, which indicates that specific illnesses rather than the dichotomous presence or absence of chronic illness may be more predictive of parenting differences. It is unclear from these data whether or not protective parenting

was precipitated by the onset of children's chronic illness, particularly given complex associations between protective parenting and parental anxiety. Further study will be needed to disentangle how these constructs relate to one another and to other aspects of parenting. Parents' management of their children's emotions, for example, is thought to be related to both parental anxiety and protective parenting.

Caregiver Emotion Socialization

In the developmental psychology literature, *parental emotion socialization* refers to the process through which parents shape their children's emotional development (Eisenberg et al., 1998). Parents socialize emotional styles and emotion regulatory behavior through modeling, direct coaching, and responding contingently to different emotions (Eisenberg et al., 1998; Ellis et al., 2014; Halberstadt & Eaton, 2002). Anxious parents, protective parents, and caregivers for children with various chronic illnesses have all been observed with differences in emotional climate, emotional responsiveness, and emotion-related parenting (Creswell, Cooper, & Murray, 2015; Edwards, Rapee, & Kennedy, 2010; Pinquart, 2013); however, these aspects of emotion socialization have yet to be studied in conjunction with childhood food allergy.

Unlike modeling and direct coaching, contingent responding operates based on principles of operant conditioning. Emotion-contingent responses are thought to selectively reinforce or punish children's expression or suppression of specific emotions (Eisenberg et al., 1996). For example, when a parent responds to their child's fearful affect by rewarding or comforting the child, subsequent expression of fear is reinforced (Bai, Repetti, & Sperling, 2016; Chaplin et al., 2010); however,

when a parent responds in a dismissive, punitive, or neglectful manner, the child's subsequent expression of fear is discouraged (Eisenberg et al., 1996). Eisenberg (e.g., Eisenberg et al., 1996; Eisenberg et al., 1998) referred to these two types of responses as supportive and nonsupportive responses, respectively.

Much of the literature on caregivers' emotion response style is based on Dr. John Gottman's Meta-Emotion Theory and several decades worth of research on the topic (Gottman, Katz, & Hooven, 1997. Gottman (1997) proposed that encountering one's own emotions or that of others concurrently elicits secondary emotions and cognitions about the primary emotion; in other words, "feelings about feelings" or meta-emotion. For example, some parents may think that children should not express anger in public—and become distressed when their children do so. The organized set of emotional, cognitive, and behavioral responses to emotion that one typically enacts is what Gottman termed the "meta-emotion structure." This includes one's beliefs about specific emotions or their "meta-emotion philosophy."

Over many years of study, Gottman identified two overarching meta-emotion philosophies that best predicted how parents would respond to their children's emotions. Parents who view emotions as healthful, value emotional awareness, and believe in teaching their children about emotions are said to be "emotion-coaching" or "EC-type" (Gottman, Katz., & Hooven, 1996; Gottman et al., 1997). Emotion-coaching parents are more likely to respond to their children's emotions with reward or validation (Gottman et al., 1996). Conversely, parents who view negative emotions as harmful, value emotional suppression, and believe that their role is to alleviate emotional distress are said to be "emotion-dismissing" or "ED-type" (Gottman et al.,

1996; Gottman et al., 1997). Emotion-dismissing parents are more likely to respond to anger or sadness with dismissal or punishment (Gottman et al., 1996). Importantly, emotion-contingent responding is just one aspect of parents' overarching emotion socialization style, though it may reflect other socialization behaviors such as direct instruction about emotions, and emotional modeling.

In addition to the operantly defined responses (i.e., *reward* and *punishment*), parents may enact other types of emotion-contingent responses in different contexts. These include *magnification* (i.e., matching or exceeding the child's negative affect), *distraction* (i.e., redirecting attention from the child's emotional experience), and *dismissal* (i.e., minimizing or invalidating the child's affect). These responses are distinct in that they are believed to influence children's development of emotion regulation (ER) capabilities, rather than to directly modify overt expression (Ellis et al., 2014; Meyer et al., 2014; Morris et al., 2011).

For example, magnification of a child's sadness might reflect one form of modeling, thus socializing regulation of affective intensity. Parental magnification of negative emotion is typically conceptualized as a maladaptive emotion socialization strategy when used in excess, given its tendency to escalate emotionally arousing situations (O'Neal & Magai, 2005; Silk et al., 2011). Magnification is distinguished from empathy (i.e., sharing in another's emotional experience) by its self-focused nature (Eisenberg et al., 1998). Whereas an empathetic response might be to acknowledge a child's sadness with genuine positive regard, a magnifying response would involve overt personal distress. Eisenberg and colleagues (1998) theorize that this personal distress reflects an inability to regulate one's own experience of others'

emotions, and that parents that respond to children's negative emotions with distress may be modeling poor emotion regulatory behavior. This could explain why parental magnification of negative emotions predicts children's internalizing and externalizing outcomes (O'Neal & Magai, 2005; Silk et al., 2011).

Distraction and dismissing were originally conceptualized as part of another construct termed *overriding* (O'Neal & Magai, 2005; Tomkins, 1963). Overriding refers to parents' attempts to silence a child's emotion using distraction from or minimization of the expressed affect (O'Neal & Magai, 2005; Silk et al., 2011). Based on Gottman's theory of meta-emotion philosophies, both distraction and dismissing were conceptualized as emotion-dismissive socialization because they arise from the perception of negative emotion as harmful (Gottman et al., 1996; Gottman et al., 1997).

Indeed, both distraction and dismissing may precipitate a decrease in children's subsequent affect; however, recent evidence suggests that they predict very different long-term outcomes in emotion regulation (Eisenberg et al., 1998). Having one's emotions dismissed or invalidated is associated with poorer emotional competence, poorer social competence, and avoidant coping (Eisenberg et al., 1998); whereas, distraction from one's negative emotions is effective as an emotion-focused solution to distress and is associated with children's increased use of adaptive emotion coping strategies (Mirabile, Scaramella, Sohr-Preston, & Robison, 2009; Wiggins, 2005). Particularly within medical contexts, distraction has proven to be an effective emotion coping strategy for use with children undergoing medical

procedures (Fowler-Kerry & Lander, 1987; Manne, Bakeman, Jacobsen, Gorfinkle, & Redd, 1994).

Though parents' choice of contingent response is strongly influenced by contextual variables (e.g., parent's mood, beliefs about emotion, relationship with the child) (Katz, Maliken, & Settler, 2012; Premo & Kiel, 2014), researchers have observed that certain emotions tend to elicit certain responses more frequently than others (Izard & Ackerman, 2000; O'Neal & Magai, 2005). Emotions such as joy, empathy, and excitement typically elicit supportive responses (e.g., reward). Others, such as anger and envy, are more likely to elicit nonsupportive responses (e.g., punishment) (Chaplin & Cole, 2005; Chaplin, Cole, & Zahn-Waxler, 2005). The response elicited by emotions like sadness or worry may depend upon the intensity of the emotion and social norms (Eisenberg et al., 1998; McBride, Schoppe, & Rane, 2002). For example, behavior associated with intense sadness (e.g., crying) may be more likely to prompt a reaction than less intense sadness (e.g., frowning).

It is necessary to consider the child's sex when examining parental emotion socialization, given the relevance of gender roles and norms to parenting of children's emotional behavior (Chaplin et al., 2005; Chaplin et al., 2010). Notably, parents tend to reinforce expression of sadness and fear with daughters, and are more likely to respond favorably to anger with sons (Root & Denham, 2010). Parents also tend to put more pressure on boys to display less emotion (Eisenberg et al., 1998). Not surprisingly, a recent meta-analysis conducted by Chaplin and Aldao (2013) found that girls were significantly more likely than boys to express positive emotions (e.g., happiness, excitement, interest) and internalizing emotions (e.g., sadness, anxiety);

whereas, boys were more likely to express externalizing emotions (e.g., anger). These differences became more pronounced with age and vary depending upon the presence of others (i.e., alone, with parents, with peers), which suggests the influence of various socializing agents.

How parents respond to children's emotions may also depend on the child's age and developmental level (Eisenberg et al., 1998). Emotion socialization during the first two years of life is primarily characterized by caregiver sensitivity and responsiveness to infant emotions. Caregivers that actively engage with their infants, model affect, and respond contingently to their infants' affective displays are believed to not only shape emotional development, but to also provide external soothing and regulation of infant arousal (Eisenberg et al., 1998). Conversely, caregiver disengagement and noncontingent responding is associated with infants' poorer regulation of arousal and expression of distress. During early childhood, caregivers may begin to provide direct coaching while continuing to shape behavior with emotion-contingent responses and affective modeling. Though emotion socialization is an ongoing process throughout youths' formative years, there is some evidence to suggest that early childhood is a critical or sensitive period in the development of emotional competency and comprehension (Izard & Ackerman, 2000; Eisenberg et al., 1998).

Whether parents respond supportively or nonsupportively to their children's emotions also depends upon their perception of the emotion and their meta-emotion philosophy (Gottman et al., 1996; Gottman et al., 1997). Some adults experience certain emotions as aversive and may attempt to avoid suppress them in others. For

example, adults with anxiety tend to experience negative emotions, particularly worry and sadness, as distressing (Kertz, Stevens, McHugh, & Björgvinsson, 2015; Stapinski, Abbott, & Rapee, 2010). In a study of parents with preschool-age children, parents with higher state and trait anxiety perceived their children as more anxious and felt less able to control their children's negative mood and behavior (Wheatcroft & Creswell, 2007). Several studies have observed that mothers with anxiety are more concerned with managing their children's affect and are less likely to respond supportively to their children's negative emotions and (Williams, Kertz, Schrock, & Woodruff-Borden, 2012; Williams & Woodruff-Borden, 2015).

This effect may not pertain only to negative emotions. Some studies have observed anxious avoidance of positive emotions (Bardeen, Tull, Stevens, Tull, & Gratz, 2014), or all emotions indiscriminately (Olatunji, Mortez, & Zlomke, 2010). Beebe and colleagues (2011) noted that mothers with anxiety are less likely to match their infant child's emotions overall and are less likely to offer physical comfort than non-anxious mothers. In general, mothers with anxiety tend to be more sensitive to their children's distress, more protective, more critical, and more likely to respond negatively to their children's behavior (Creswell et al., 2015; Root, Hastings, & Rubin, 2016). Given the prevalence of anxiety in families affected by childhood food allergy and the contribution of anxiety to nonsupportive responding, children with food allergies may be more likely to experience nonsupportive responses to their emotions than their healthy peers.

Given the theoretical overlap and strong association between maternal protectiveness and anxiety (Pinquart, 2013), it is likely that protective parenting will

predict similar differences in emotion-contingent responding. Both anxious and protective behavior may be motivated by the desire to avoid children's overt distress (Kiel & Maack, 2012). In which case, distress avoidance may also manifest in protective parents' interactions with their children. Tiwari and colleagues (2008) hypothesize that mothers who perceive their children's negative emotions as aversive may become personally distressed and subsequently respond in ways that discourage further negative affect; however, this hypothesis has not yet been tested.

Few studies have examined emotion socialization within the context of childhood chronic illness, despite the prevalence of anxiety and protective parenting in pediatric caregiving populations and the theoretical basis for parenting differences. At this time, only a handful of studies were identified that investigated some form of emotion socialization among pediatric caregiving parents (Dunn et al., 2011; Malatesta, Grigoryev, Lamb, Albin, & Culver, 1986).

Malatesta and colleagues (1986) conducted an early study of mothers with preterm and full-term infants. They discovered preterm infants expressing pain elicited fewer maternal responses over time than full-term infants (Malatesta et al., 1986). Mothers were also less likely to match and more likely to ignore preterm infants' affect, which the authors attributed to preterm infants' relatively greater display of negative emotion. These results may have reflected mothers' attempts to avoid personal distress or to avoid reinforcing aversive behaviors.

Likewise, in studies involving children with asthma, disease severity was associated with families' negative emotional climate, characterized by maternal control, low warmth, and negative expressiveness (Walker, 2013; Wood et al., 2007).

Similar findings were also observed among mothers of diabetic children (Liakopoulou et al., 2001). Though preliminary, these studies identify a possible effect of childhood chronic illness on caregivers' emotional expressivity, emotional warmth, and emotional responsiveness. There is an apparent need for further study to clarify how childhood chronic illness and parental emotion socialization relate and to identify mechanisms of change.

Despite an apparent presence of nonsupportive emotion socialization in the pediatric literature, most caregiving mothers are likely to be supportive. To that end, Dunn and colleagues (2011) observed that mothers caring for children with cancer displayed more positive mood than sadness, more warmth than hostility, and more child centeredness than neglect or distancing; however, these observations were not compared to a healthy control group. Given preliminary evidence that how mothers respond to their chronically ill children may differ, the topic merits further study with a healthy comparison group.

In addition to examining the respective roles of mothers' anxiety, protective parenting, and caregiving status in emotion socialization, it is also necessary to consider the context in which contingent responses occur. Children's expressivity varies considerably by context, including the demandingness of tasks, the presence of parents or other adults, and the familiarity of the environment (Premo & Kiel, 2014; Eisenberg et al., 1998). Mothers have more opportunities to respond contingently when their children are more expressive. Mothers may also be more likely to respond when they are motivated to modify their children's affect, such as when that affect is contextually or socially inappropriate (Eisenberg et al., 1998). To account for a

greater range of contextual variables that might influence children's expressivity, the present study examined mother-child interactions in two contexts: one "easy" task that was unlikely to be arousing, and one "difficult" task that is likely to elicit various emotions. Mothers' responses to each emotion during both tasks were be observed and compared across conditions (i.e., food allergy, healthy).

Hypotheses

Consistent with prior research (Chaplin, 2008; Cole, Wiggins, Radzioch, & Pearl, 2009), children's emotional expression is operationalized as observed verbal, facial, and gestural display of sadness, anger/frustration, anxiety/worry, and happiness, while mothers' responses are operationalized as observed reward, dismissal, distraction, punishment, magnification, or neglect of children's affective displays. This study represents a novel approach to the examination of maternal emotion socialization by inclusion of concomitant maternal anxiety, maternal protectiveness, and children's health status in the conceptual framework.

The study involves a secondary data analysis and observational coding of video recordings that were collected as part of a larger study, which took place in an urban setting on the eastern coast of the United States. The present study aims to build upon the previous larger study by generating new data, which isolate the specific role of emotion socialization in mothers' parenting behavior. The following hypotheses were examined:

H_1: Mothers of children with food allergies will exhibit higher protective parenting (H_{1a}), state anxiety (H_{1b}), and trait anxiety (H_{1c}) than mothers with healthy children, given previous findings that maternal anxiety and protective parenting are

more prevalent among caregivers and among mothers caring for children with food allergies.

H_2: Mothers with higher self-reported state anxiety (H_{2a}), trait anxiety (H_{2b}), and protective parenting (H_{2c}) will be less likely to provides supportive responses and more likely to provide nonsupportive responses to emotion, given evidence in the literature that anxious and protective mothers are less likely to reinforce children's affect and more likely to discourage expression.

H_3: Mothers in the food allergy condition will be less likely than mothers in the healthy condition to provide supportive responses (i.e., Reward, Distract), given literature which suggests that anxious maternal emotion socialization patterns may apply to caregivers of medically vulnerable children.

H_4: Mothers in the food allergy condition will be more likely than mothers in the healthy condition to provide nonsupportive responses (i.e., Dismiss, Punish, Neglect, Magnify), given literature which suggests that anxious maternal emotion socialization patterns may apply to caregivers of medically vulnerable children.

H_5: The effect of mothers' state anxiety (H_{5a}), trait anxiety(H_{5b}), and protective parenting (H_{5c}) on choice of emotion-contingent response will be stronger among mothers caring for children with food allergies, given evidence that pediatric caregiving may uniquely influence the quality and intensity of mothers' anxiety symptoms and protective behavior.

Chapter 2: Method

Participants

Participants were recruited from pediatricians' offices via fliers and from referrals from other participants. Exclusion criteria for participants in both groups were a) the presence of another significant medical condition (e.g., cancer, diabetes, autoimmune disease, illness requiring hospitalization within the past year), b) the presence of a severe sensory deficit (e.g., blindness, hearing loss), c) the presence of a significant developmental delay or neurocognitive impairment, d) the presence of a food intolerance that is not IgE-mediated (e.g., lactose intolerance), e) and the inability to speak English. For the food allergy group, the presence of a comorbid allergic condition (e.g., eczema, asthma, and allergic rhinitis) was allowed, given high rates of co-occurrence (Tan & Corren, 2011; Savage & Johns, 2015); however, those who had experienced life-threatening symptoms related to a comorbid allergic condition (e.g., acute asthmatic attack) were excluded. Participants with food allergies confirmed by their pediatrician were allocated to the food allergy group while participants without food allergies who were eligible to participate were assigned to the healthy group.

Data were collected from 132 children (52.3% male, 47.7% female) ages 3 - 6 years (M_{age} = 4.87 years) and their mothers (M_{age} = 36.43 years; Range = 27 - 50). Participants were 65 children with pre-existing food allergies (M_{age} = 4.81 years; 78.5% Caucasian, 7.7% African American, 3.1% Asian, 1.5% Latino, 9.2% Other)

and 67 healthy controls (M_{age} = 4.92 years; 76.1% Caucasian, 11.9% African American, 6.0% Asian, 3.0% Latino, 3.0% Other). Participants in the control group did not differ from those in the food allergy group in terms of grade, ethnicity, or socioeconomic status (see Table 1); however, the food allergy group included more boys than girls (64.6% male, 35.4% female), while the control group included more girls than boys (40.3% male, 59.7% female). Families in the food allergy (90.1%) and control (93.5%) groups were primarily of middle to upper-middle class socioeconomic status (Hollingshead Index ≥ 40; Hollingshead, 1975). There were also no significant group differences in the number of siblings in each family, $t(126) = -0.46$, $p = .647$.

Children in the food allergy group reported a range of allergen types and number of allergic symptoms. The number of current food allergies ranged from 1 to 12 ($M = 3.72$, $SD = 2.32$). Time since initial diagnosis ranged from 0.33 to 5.95 years ($M = 3.16$, $SD = 1.52$). Allergens reported were peanuts ($N = 52$; 80%), tree nuts ($N = 46$; 71.9%), eggs ($N = 35$; 54.7%), milk ($N = 26$; 40.6%), shellfish ($N = 21$; 32.8%), scaled fish ($N = 10$; 15.6%), fruit ($N = 11$; 17.2%), vegetables ($N = 4$; 6.3%), wheat ($N = 8$, 12.5%), other grains ($N = 3$, 4.7%), and soy ($N = 6$; 9.4%). Mothers also reported that 67.2% ($N = 43$) of children had comorbid eczema and 48.4% ($N = 31$) had comorbid asthma. These rates of co-occurrence are consistent with other studies of allergic conditions in young children (e.g., Friedman & Morris, 2006; Savage & Johns, 2015).

For each allergen, mothers rated the perceived severity of their child's allergy and the degree to which they worry about the allergy. Across all allergens, mothers'

severity ratings ranged from 1.86 to 7.00 (M = 4.18; SD = 1.61) and worry ratings ranged from 1.91 to 7.00 (M = 4.72; SD = 1.50). The highest rating obtained was a 7.00 and the lowest rating was 1.00, which reflects the full range of options. For descriptive statistics of severity and worry ratings by allergen, see Table 2.

Twenty-three (35.4%) mothers reported that their child had a history of anaphylaxis. Of those, seventeen (81.0%) had experienced one anaphylactic episode and four (19.1%) had experienced two or more anaphylactic episodes. Twenty-one (31.8%) mothers reported one or more visits to the emergency room for an acute allergic reaction. Two (3.0%) additionally reported that their child had experienced one or more overnight hospital stays. All 65 participants with food allergies had been prescribed an epinephrine auto-injector (i.e., EpiPen), and of those 60 (95.2%) reported carrying it "always" or "most of the time."

Procedure

Mothers provided informed written consent and children gave oral assent prior to participation. Mothers were also asked to sign a Release of Medical Information form, so that children's health information could be verified with their pediatricians. All participants took part in an observational task adapted from Colman and Thompson (2002), during which children attempted to solve two puzzles while mothers completed additional questionnaires. Mothers were instructed to fill out questionnaires while their children completed the puzzles and to intervene only when they felt it necessary. Children were allowed 6 minutes to complete each puzzle, during which time they were also audio and video recorded. Upon completion of the

study, mothers were issued $50 Target gift cards while children were offered their choice of age-appropriate toy (worth approximately $5).

Measures

Family Demographics and Health

A demographics questionnaire was administered to mothers, with questions assessing mother's age, child's age, child's grade, home school status, marital status, parents' occupations, and parents' educational attainment. Information from this questionnaire was used to calculate Hollingshead's (1975) index of socioeconomic status (SES) for each family.

Mothers were also asked to rate the likelihood, predictability, and controllability of their children's exposure to an allergen, the recency and severity of the most recent allergic reaction, as well as the expected severity of a reaction if it were to occur again. Perceived severity was rated on a 7-point Likert-type scale from 1 (Very Mild) to 7 (Very Severe); whereas, Worry was rated on a similar scale from 1 (Not Worried) to 7 (Very Worried). These types of ratings have proven useful in other studies of caregiving, as they tend to be better predictors of parental psychosocial adjustment than physical indicators of disease (Brown, Connelly, Rittle, & Clouse, 2006; Weinstein, 2000). For the purposes of the present study, these data were used for descriptive purposes only.

Maternal Anxiety and Protectiveness

Prior to the observational task, mothers completed the State-Trait Anxiety Inventory (*STAI*; Spielberger et al., 1983) and Protectiveness Scale (*PS*; Hardy,

Power, & Jaedicke, 1993) assessing maternal anxiety and protective parenting, respectively. The STAI is a widely-used 48-item measure of adult dispositional (i.e., trait) and momentary (i.e., state) anxiety. The trait anxiety subscale contains 24 items rated on Likert-type scale from 0 (*almost never*) to 4 (*almost always*). The state anxiety subscale includes 24 items rated from 0 (*not at all*) to 4 (*very much so*). Higher scores indicate greater anxiety. Both subscales have demonstrated excellent internal consistency and test-retest reliability, with reliability coefficients ranging from .86 to .95 and .65 to .75, respectively (Spielberger et al., 1983). This measure has been validated for use with clinical, caregiving, and normative adult populations (Elliott et al., 2001; Shewchuk, Richards, & Elliott, 1998; Spielberger et al., 1983).

The 12-item Protectiveness Scale (Hardy et al., 1993) yields a score that reflects a parent's desire to protect their child from physical harm or distress (e.g., "If my child hurt himself at a friend's house, I wouldn't let them return"). Items are rated on a 6-point Likert-type scale from 1 (*not at all descriptive of me*) to 6 (*highly descriptive of me*). The Protectiveness Scale is a dimensional measure of protectiveness ranging from normative to excessive protective behavior. Higher scores indicate greater protectiveness; whereas, lower scores reflect mild to moderate protectiveness.

The Protectiveness Scale (Hardy et al., 1993) was initially validated using principal components factor analysis in a study of 60 children and their mothers, which demonstrated that protectiveness scores loaded onto one factor with related measures of control-oriented parenting (Power, 1993). The Protectiveness Scale has since demonstrated predictive validity in a sample with medically vulnerable youth.

Specifically, in a study of mothers (n = 56) caring for children with epilepsy, protectiveness was strongly associated with mothers' self-reported anxiety about epilepsy at two time points over a 1-year period and inversely associated with children's adaptive functioning (Chapieski et al., 2005). For the original study, two items not relevant to families with preschool age children were dropped. Internal consistency of the resultant 10-item scale was adequate (Cronbach's $\alpha = .62$).

Observational Puzzle Task

The first "easy" task was an 8-piece Donald Duck puzzle (Hasbro©, Pawtucket, R.I., 2003) appropriate for children ages 2-6 years. The second "difficult" task was a 41-piece "See Inside" puzzle depicting the interior and exterior of an airplane (Ravensburger Spieleverlag©, Ravensburg, Germany, 1992) appropriate for children eight years of age or older. Pilot testing of the two puzzles indicated that children ages 3-6 years were unable to complete the "difficult" puzzle within six minutes. In Colman and Thompson's (2002) original study and in the modified replication by Dahlquist and colleagues (2014), children differed in the degree to which they could solve each puzzle independently.

This method, comparing problem-solving tasks of different difficulties, has also been used by investigators to examine mothers' responses to their children's emotions (Hastings et al., 2008; Newland & Crnic, 2011). Hastings and colleagues (2008) aggregated observed parental protectiveness across three tasks of varying difficulty—story-telling with blocks and figures, learning origami, and cleaning the play area. Observed protectiveness during these tasks was associated with self-reported protectiveness and was predictive of children's subsequent internalizing.

Likewise, Newland and Crnic (2011) averaged mothers' coded emotions across three problem-solving tasks of increasing difficulty (i.e., foam puzzle, block design, and challenging maze) and found that mothers' affective behavior could predict children's externalizing behavior 12 and 24 months later. Consistent with the studies described, the present study recorded behaviors observed in both conditions and aggregated the codes to create a total score reflecting multiple contexts.

Observational Coding Systems

Audiovisual recordings of the puzzle task were initially transcribed and coded as part of the larger study. In the present study, investigators conducted a secondary recoding of the observational puzzle task with an emphasis on mothers' responses to their children's affective displays. Two observational coding systems were selected on the basis of reliability and validity evidenced in previous studies, as well as the availability of a manual (described below). Both systems have successfully been used to identify individual differences in children's affect and mothers' responses (Chaplin et al., 2010; Dennis, Cole, Wiggins, & Cohen, 2009).

For the present study, observational methods were selected because they are able to capture social interaction behavior more readily than survey methods (Bakeman & Gottman, 1997). Moreover, global—rather than granular—coding systems were selected given their ability to capture the broader constructs (i.e., social display of affect, supportive and nonsupportive responses) of interest. Manuals were used to train three research assistants until percent agreement amongst observers reached approximately 80%. Using both coding systems (i.e., emotion coding and response coding) simultaneously, RAs coded approximately 18% (N = 23) of the

videos together and the remainder independently, consistent with a partially crossed design. RAs were unaware of participants' health statuses and the present study's hypotheses throughout the coding process.

Final inter-rater reliabilities were calculated using Fleiss's Kappa—a metric that is appropriate for use with more than two coders and nominal data. Fleiss Kappas were computed for each 15-second interval (approximately 46 per video) resulting in a mean Fleiss Kappa of .69 (*SD* = 0.11; Range = .42 – 1.00) indicative of moderate inter-rater reliability. This is consistent with the reliabilities obtained with these coding systems in previous studies (e.g., Cole, Wiggins, Radzioch, & Pearl, 2009; Chaplin, 2008; Chaplin et al., 2010).

Child Emotion Coding

The emotion coding system was adapted by Cole and colleagues (2009) from a system initially validated by Denham and Grout (1993). This system utilizes global codes for children's emotions based on vocal, facial, postural, and gestural cues. Affect displayed during 15-second intervals may receive codes of Happy, Sad, Angry, Anxious/Worried, or Neutral, given cues reliably described in the literature (Ekman & Friesen, 2003; Izard, 1971; Scherer, 2003) and reiterated in the manual (see Appendix D). Coders in the original study coded nine participants chosen at random with considerable reliability, Kappa = .90 (Denham, 1993; Denham & Grout, 1993). The authors observed that most errors were due to omission of an emotion code, rather than misattribution. Children averaged three or more emotions per 5-minute period. Sequential statistics generated from these data were predictive of children's emotional competence, with effect sizes (i.e., R^2) that ranged from .15 to .52. Cole

and colleagues (2009) achieved similar effect sizes (partial η^2 = .11 - .47) predicting children's ability to cope with challenging tasks using the modified system and with moderate interrater reliability (Kappa = .72).

In the present study, affect was identified using the following codes as described in the manual authored by Cole and colleagues (2009):

I. *Happy*, affective display of joy, excitement, delight, or glee.

II. *Sad*, affective display of disappointment, regret, or dejection.

III. *Angry/Frustrated*, affective display of frustration, hostility, or annoyance.

IV. *Anxious/Worried*, affective display of tension, wariness, or unease.

See Appendix A for an exhaustive list of cues and coding instructions. The intensity of each emotion code was rated from 1 (*slight intensity*) to 3 (*strong intensity*), reflecting variation in number, duration, and clarity of cues. Coding of children's emotions were exhaustive and included ratings of "0" when no emotion was observed during a 15-second interval.

To account for low-frequency events (i.e., less common types of affect), Chaplin and colleagues (2010) aggregated Sad and Anxious emotion codes to reflect internalizing emotions. This derives from the works of Nancy Eisenberg (e.g., Eisenberg et al., 1996; Eisenberg et al., 1998; Eisenberg et al., 1999) who classified sadness and anxiety as internalizing emotions thought to facilitate withdrawal from threat or social support seeking. Anger and frustration were classified as externalizing emotions thought to motivate threat approach or (sometimes) hostility; whereas, happiness—the quintessential positive emotion—is believed to promote social bonding and goal-oriented behavior (Eisenberg et al., 1998; Izard & Ackerman,

2000). The present study employed a similar strategy to Chaplin and colleagues (2010), utilizing three classifications from the literature: Internalizing Emotions (i.e., Sad & Anxious/Worried), Externalizing Emotions (i.e., Angry/Frustrated), and Positive Emotion (i.e., Happy).

Mother Response Coding

The coding system authored by Chaplin (2008) was originally adapted from two established self-report measures of parental emotion socialization—the Emotions as a Child questionnaire (*EAC*; Magai, 1996) and the Coping with Children's Negative Emotions Scale (*CCNES*; Fabes et al., 1990). Codes reflect five parental emotion socialization responses: Support/Reward (i.e., comforting the child), Override (i.e., distracting the child or dismissing the emotion), Magnify (i.e., displaying the same negative emotion), Neglect (i.e., ignoring the child), and Punish (i.e., chastising the child). The categories that comprise this coding system were derived from theory and intended for use with a frustrating parent-child interaction task that elicits both children's emotions and mothers' responses (Chaplin, 2008). Each code is assigned to responses issued within 10 seconds of onset of a child's affective display, given onset and offset times documented during the first viewing. Multiple response codes may be assigned to each interval.

This is the first observational coding system for maternal emotion socialization to be adapted from established self-report questionnaires; however, it has yet to be validated with a sufficiently large sample. In one study involving 26 low-income, primarily African American (76%) mothers and their young children (ages 2 - 6), Chaplin and colleagues (2010) detected meaningful variation in mothers'

responses to their children's emotions. That is, mothers were seven times more likely to respond supportively to boys' anger than to girls' anger and twice as likely to respond punitively to girls' anger than boys' anger. Mothers were also slightly more likely to override sadness and anxiety with girls than with boys. These findings reflect gender differences often observed with Caucasian middle-class families as well (Chaplin et al., 2005); however, the study's small sample size reflects a need for further research with this instrument.

The present study adapted Chaplin's (2008) emotions socialization coding system for coding of mothers' responses to their children's affect. As proposed, the present coding system divided Chaplin's (2008) "Override" code into separate "Distract" and "Dismiss" codes, given evidence from the literature that Override encompasses these discrete and often contradictory constructs (Gottman et al., 1997; Silk et al., 2011). The following six codes were issued as described in the updated manual (see Appendix E):

I. *Reward*, a response that reinforces maintenance or increase of affect.

II. *Distract*, a response that redirects attention from affect-inducing stimuli.

III. *Dismiss*, a response that minimizes or invalidates affect.

IV. *Magnify*, a response that corresponds in affective intensity or duration.

V. *Punish*, a response that rebukes or limits affective behavior.

VI. *Neglect*, the absence of a response to obvious affect.

Codes I (Reward), IV (Magnify), V (Punish), and VI (Neglect) use the original criteria developed by Chaplin (2008). Criteria for codes II (Distract) and III (Dismiss) reflect criteria described in the literature (Gottman et al., 1997; Silk et al., 2011).

For the present study, these codes were combined to reflect two categories: emotion-supportive and emotion-nonsupportive responses, as described in the literature (e.g., Eisenberg et al., 1998; Eisenberg et al., 1999). Reward and Distract codes comprise the emotion-supportive category. Neglect, Dismiss, Punish, and Magnify codes comprise the emotion-nonsupportive category. Distraction could also be considered nonsupportive, in that it does not directly reinforce affect; however, it has been suggested as a supportive strategy because it does not necessarily discourage affect and may teach adaptive emotion-coping skills (Mirabile et al., 2009). Similarly, Magnify might be construed as emotion-supportive if it involved magnification of positive emotion. In order to remain consistent with Eisenberg and colleagues' (1998) description of magnification involving personal distress, the present study only coded magnification of negative emotions. As described in the literature, Magnification of negative affect does not directly discourage affect, but tends to increase the child's distress level and ultimately reduce the odds of future expression (Eisenberg et al., 1998).

Analytic Strategy

Preliminary data screenings were performed to assess the quality and normality of the data. Variables with significant skew or kurtosis were transformed to normality for use in subsequent analyses. Mean differences in the transformed variables were then tested with two-way analysis of variance (ANOVA) to determine whether conditions differed in terms of key variables. Missing data were excluded from each analysis on a casewise basis, such that only participants with complete information were included. Likelihood ratio chi square tests were used to assess

demographic differences between conditions, as reported in Table 1. Given that the sex distribution of children in each condition differed significantly (χ^2 = 7.82, p = .005), sex was included as a covariate in all analyses.

Maternal responses to children's affect were initially examined with lag sequential analyses (Bakeman & Gottman, 1997; O'Connor, 1999) using IBM Statistical Package for Social Sciences version 21 (SPSS; IBM Corporation, 2012). Lag sequential analyses were appropriate due to the cross-dependent nature of children's emotions and mothers' responses in an observational setting. By definition, each mother's response is contingent upon the child's prior affective display; therefore, each unit of analysis could not be considered independent–an assumption required by many inferential statistical tests.

Sequential analyses rely on observational coding that maintains the sequence of events. These data are used to generate transitional frequencies—which indicate how often each code directly followed another (i.e., with a lag of "1")—and transitional probabilities, which indicate whether the presence of one event increases the likelihood of another. Other statistics are calculated to index significant patterns in these data (i.e., adjusted residuals) and the effect size of these patterns (i.e., Yule's Q). This type of analysis is robust and widely used by researchers of inter-personal interaction (Bakeman & Gottman, 1997; McComas et al., 2009; O'Connor, 1999).

To obtain appropriate cell sizes for analysis and for ease of interpretation, aggregate transitional frequencies were computed by summing the transitional frequencies of individual behavioral codes (see Table 3). These combined totals were computed for all possible emotion-response sequences (e.g., Supportive of Happy,

Supportive of Internalizing Emotions, Nonsupportive of Externalizing Emotions, etc.) including responses to emotion globally (i.e., Global Supportive, Global Nonsupportive).

The resultant set of aggregate transitional frequencies were then used to compute additional sequential statistics, including transitional probabilities, adjusted residuals (z-scores), adjusted residual p-values, and Yule's Qs. These statistics reflect the likelihood of a response relative to chance, accounting for the antecedent's base rate. Group differences in emotion-response sequences were assessed at three levels, using transitional frequencies, transitional probabilities, and adjusted residuals—given the unique information contributed by each sequential statistic. Individual-level regression analyses were then conducted with transitional frequencies, given the ease with which frequencies can be interpreted in regression.

Group differences in the incidence of each emotion were examined prior to evaluating mothers' emotion-contingent responses. To account for base rates of each emotion, binomial logistic regressions were conducted predicting the frequency of the specific emotion out of the total frequency of all emotions. Each logistic model therefore predicts the odds of an emotion occurring or not occurring relative to other emotions that were coded, given membership in one condition or the other, and controlling for the child's sex. In an effort to identify the best-fitting model, sex by condition interactions were examined initially. If the interaction was not significant, the model was rerun with the interaction term excluded.

Binomial logistic regressions were then conducted to examine group differences in the incidence of mothers' emotion-contingent responses. To account

for the base rate of each response, binomial logistic regressions were conducted predicting the transitional frequency of the maternal response to the emotion of interest out of the total frequency of that emotion. The logistic models therefore predict the odds of the response occurring or not occurring, given the base rate of the antecedent, the influence of the predictor, and all else (i.e., the child's sex) held equal.

Three binomial logistic regressions with a logit link were performed for each dependent variable; therefore, the significance of each model was evaluated using a Bonferroni correction of the alpha ($\alpha = .05$) divided by three, such that $\alpha \leq .017$ was the criterion to which *p*-values were compared. Protective parenting, state anxiety, and trait anxiety were entered as predictors in each model, separately. Child's sex was entered as a covariate in all models. Models were initially run including an interaction term between the child's sex and the condition (i.e., healthy, food allergy). If the interaction term was not significant, the model was rerun with the interaction term excluded. Original models are reported in Appendix A.

Moderation analyses were also conducted with binomial logistic regression. All models controlled for child's sex. Predictors included either protective parenting, state anxiety, and trait anxiety and an interaction term between the predictor and the condition. Given a significant model as indicated by a likelihood ratio chi square test with $p < .016$, parameters associated with the interaction term were evaluated for evidence of moderation. In the event of a significant interaction term, the interaction was further probed by examining the residuals of the linear predictor and the marginal means.

Power Analyses

A priori power analyses initially predicted that analysis of group-level sequential statistics would be able to detect medium effect sizes ranging from $g = .47$ (at Power = .80) to $g = .49$ (at Power = .95), given $\alpha = .05$. Post-hoc power analyses revealed that the smallest effect size obtained (Yule's $Q = .39$) with observed power equal to .78, which is slightly lower than predicted. This suggests that the two-proportion z-test used in comparison of transitional probabilities was slightly underpowered.

Multiple logistic regression analyses were expected to detect small effect sizes with odds ratios ranging from OR = 1.78 (at Power = .80) to OR = 2.24 (at Power = .95), given $\alpha = .05$ and four predictors per model. Post-hoc power analyses revealed that for small effect sizes of OR = 1.78 or OR = 2.24, observed power was .37 and .61, respectively. This suggests that logistic regression analyses were also underpowered for the present study.

Chapter 3: Results

Preliminary Analyses

Upon completion of observational coding, the data were inspected for normality. State anxiety and trait anxiety total scores were skewed and kurtotic such that lower scores predominated (see Table 4). Log-transformation of these variables successfully reduced skew and kurtosis to within acceptable parameters (< 1.00). Transitional frequencies for each of the emotion-response observational codes were significantly skewed, kurtotic, and heteroscedastic (see Tables 5 - 7). Thus,

parametric analyses were not suitable for these data. Instead, binomial logistic regressions were performed, given their appropriateness for nonparametric data with dichotomous outcomes (i.e, the likelihood of a behavior occurring or not occurring) and the ability of these models to account for each behavior's base rate.

Sequential Analyses

The frequency of emotion-response sequences per dyad ranged from 0 - 23 (M = 6.27, SD = 4.54), which is consistent with the reported incidence rate among similar studies. The frequency of total affect was slightly higher among dyads in the food allergy condition (N = 455, M = 7.11, SD = 4.88) than those in the healthy condition (N = 364, M = 5.46, SD = 4.06). Frequencies of each type of emotion by condition and sex are available in Appendix A. Transitional frequencies generated for sequential analysis are described in Tables 5 - 7.

Sequential analyses revealed several emotion-response contingencies that occurred more often than chance among dyads in the healthy condition, $\chi^2(11) = 588.64$, $p < .001$, and food allergy condition, $\chi^2(11) = 782.41$, $p < .001$. Mothers of healthy children were significantly more likely than chance to provide supportive responses to children's positive emotion ($P = .72$, $z = 3.91$, $p < .001$, Yule's $Q = .79$) and internalizing emotion ($P = .87$, $z = 8.16$, $p < .001$, Yule's $Q = .90$), but not externalizing emotion ($P = .48$, $z = -0.48$, $p = .210$, Yule's $Q = .27$). Mothers of children with food allergies were significantly more likely than chance to provide supportive responses to all emotions, including positive emotion ($P = .63$, $z = 3.87$, $p < .001$, Yule's $Q = .69$), internalizing emotion, ($P = .73$, $z = 7.23$, $p < .001$, Yule's $Q = .78$), and externalizing emotion ($P = .63$, $z = 3.56$, $p = .029$, Yule's $Q = .59$).

Mothers in the healthy condition were also significantly more likely than chance to provide nonsupportive responses to children's positive emotion (P = .28, z = 6.52, p < .001, Yule's Q = .59) and externalizing emotion (P = .52, z = 10.98, p < .001, Yule's Q = .81), but not to internalizing emotion (P = .13, z = 0.09, p < .252, Yule's Q = -.08). Mothers in the food allergy condition provided nonsupportive responses to all emotions more often than chance, including positive emotion (P = .37, z = 8.48, p < .001, Yule's Q = .66) externalizing emotion (P = .37, z = 5.71, p < .001, Yule's Q = .54), and internalizing emotion (P = .27, z = 4.16, p = .007, Yule's Q = .39). For a summary of group-level sequential analyses, see Table 8.

Main Analyses

Hypothesis 1: **Mothers in the food allergy condition will report higher protective parenting, state anxiety, and trait anxiety than mothers in the healthy condition.**

Two-way analysis of variance (ANOVA) provided partial support for the hypothesis that mothers in the food allergy condition would report higher protective parenting, state anxiety, and trait anxiety. The first model tested main effects of condition and sex on protective parenting, as well as a sex-by-condition interaction. Levene's test for equality of variances was not significant, $F(1,128) = 1.35$, p = .247; therefore, equal variances were assumed. As shown in Table 9, the omnibus F-test of the original model was marginally significant with a significant main effect of condition. The interaction between sex and condition was also marginally significant, such that mothers of sons with food allergies reported higher protective parenting (M = 2.81, SE = 0.11) than mothers with healthy sons (M = 2.36, SE = 0.13); however,

mothers of daughters with food allergies (M = 2.61, SE = 0.14) reported similar levels of protective parenting to mothers of healthy daughters (M = 2.63, SE = 0.11).

A second ANOVA tested main effects of sex and condition on mothers' self-reported state anxiety—which had been log-transformed to account for skew and kurtosis. The model did not show evidence of heteroscedasticity, $F(3,130) = 0.12$, p = .729; however, the omnibus test was not significant, as shown in Table 9. A third ANOVA was performed testing main effects of sex and condition on mothers' trait anxiety. No heteroscedasticity was evident, $F(3,127) = 0.53$, p = .665; however, the omnibus F-test was again not significant.

Hypothesis 2: **Mothers that report higher protective parenting, state anxiety, and trait anxiety will be less likely to provide supportive responses and more likely to provide nonsupportive responses to emotion.**

Multiple logistic regressions models were constructed to assess the likelihood of mothers' supportive responses to their children's various emotions, given differences in protective parenting, state anxiety, or trait anxiety, and accounting for child's sex. Given a total number of three models per dependent variable, a Bonferroni correction was performed yielding $\alpha = .05/3 = .017$ as the adjusted minimum criterion for significance. Marginal effects ($.017 < p < .05$) are also reported. The first model examined the relation between protective parenting and the odds of a supportive response to an emotion. Both the initial model (-2 log likelihood = 436.25) and reduced model (-2 log likelihood = 438.33) were not significant, as shown in Supplementary Table 3 and Table 10, respectively.

The second model tested the hypothesis that state anxiety predicts the odds of a supportive response. The initial model was significant with -2 log likelihood = 438.57; however, the interaction effect between child's sex and state anxiety was not significant and the reduced model was subsequently tested. As reported in Table 10, this model was significant with -2 log likelihood = 439.23. The -2 log likelihood of the reduced model was greater than that of the initial model (see Supplementary Table 3), which indicates that the initial model had a slightly better fit. Consequently, only main effects of the reduced model were interpreted. There was no significant main effect of sex; however, the effect of state anxiety on the odds of a supportive response to emotion was significant, such that for each unit increase in mothers' state anxiety the odds of a supportive response decreased by 75%.

The third model tested the hypothesis that trait anxiety predicts the odds of a supportive response. As shown in Supplementary Table 3, the initial model was not significant (-2 log likelihood = 438.51). The reduced model was subsequently tested and was significant with -2 log likelihood = 438.80 (see Table 10). The main effect of trait anxiety on the odds of a supportive response to emotion was marginally significant (i.e., $\chi^2(1) = 5.06$, $p = .025$), such that for each unit increase in mothers' trait anxiety the odds of a supportive response decreased by 62%. There were no significant differences by child's sex.

Several models were then constructed to assess the likelihood of mothers' nonsupportive responses to their children's emotions. The first of these models tested the hypothesis that protective parenting predicts the odds of a nonsupportive response to emotion. As reported in Table 11, the model approached significance (i.e., $\chi^2(3) =$

9.10, p = .028) with -2 log likelihood = 415.88 and a marginal interaction between child's sex and protective parenting. Probing the interaction revealed that as protective parenting increased by one unit the odds of a nonsupportive response increased by 1.39 times among girls (B = 0.33, $\chi^2(1) = 3.88$, p = .049, OR = 1.39), but not among boys (B = -0.17, $\chi^2(1) = 1.05$, p = .305, OR = 0.85).

The initial model which examined the relation between state anxiety and the odds of a nonsupportive response was not significant (see Supplementary Table 4); therefore, the reduced model was tested. As shown in Table 11, the reduced model approached significance (i.e., $\chi^2(2) = 6.73$, p = .035) with -2 log likelihood = 425.08; however, the main effect of state anxiety was not significant. There was a marginal main effect of sex, such that girls were 1.39 times more likely to receive a nonsupportive response than boys, regardless of maternal state anxiety.

The initial model of the effect of trait anxiety on the odds of a nonsupportive response was marginally significant with -2 log likelihood = 420.03 (see Supplementary Table 4); however, the interaction term was not significant. The reduced model was tested and approached significance (i.e., $\chi^2(2) = 6.15$, p = .046) with -2 log likelihood = 422.75; however, the main effects of trait anxiety and sex were not significant.

Hypotheses 3: **Mothers in the food allergy condition will be less likely to provide supportive responses to emotion than mothers in the healthy condition.**

Before examining mothers' responses to their children's emotions, three multiple logistic regression models were constructed to assess whether the odds of

children expressing each type of affect differed by condition (see Table 12). The models that predicted the odds of positive emotion and externalizing emotion were not significant, which suggests children with and without food allergies expressed positive emotion and externalizing emotion at similar rates. However, the model that predicted the odds of internalizing emotion was significant with -2 log likelihood = 434.80 and a significant main effect of condition, such that children with food allergies were 1.47 times more likely to express internalizing affect then healthy children. These results suggest that mothers in the food allergy condition had to contend with more internalizing affect from their children than mothers in the healthy condition. None of the models yielded a significant main effect of sex, which indicates that boys and girls did not differ substantially in their expression of emotions.

Next, multiple logistic regression models were constructed to assess the likelihood of mothers' supportive responses to their children's various emotions, given their child's sex and condition. The first model examined differences in the odds of a supportive response to all emotions globally. As shown in Table 13, The model was significant with -2 log likelihood = 437.10. A marginally significant sex-by-condition interaction occurred, such that healthy boys had the greatest odds of a supportive response (OR = 2.18), while healthy girls (OR = 1.93), and boys (OR = 1.91) and girls (OR = 1.90) with food allergies were slightly less likely to receive a supportive response to affective display.

Next separate models were constructed to examine the odds of a supportive response by emotion type. As reported in Supplementary Table 5, the initial model

that predicted the odds of a supportive response to positive emotion approached significance (i.e., $\chi^2(3) = 6.93$, $p = .074$) with -2 log likelihood = 308.19 and a significant main effect of condition. No significant interaction between sex and condition occurred; therefore, the reduced model was run. As shown in Table 13, the reduced model also approached significance (i.e., $\chi^2(2) = 5.97$, $p = .051$) with -2 log likelihood = 309.16 and a significant main effect of condition, such that mothers in the food allergy condition were 39% less likely to provide a supportive response to positive emotion than mothers in the healthy condition. The odds of mothers' supportive responses to positive affect did not differ by sex.

The initial model that predicted the odds of a supportive response to externalizing emotion was significant with -2 log likelihood = 135.76; however, the interaction between sex and condition was not significant (see Supplementary Table 5). As shown in Table 13, the reduced model was also significant with no change in goodness of fit (-2 log likelihood = 135.76). In both models, the main effect of condition was not significant; however, there was a significant main effect of child's sex, such that boys were 2.75 times more likely than girls to receive a supportive response for externalizing emotion.

Lastly, the initial model that predicted the odds of a supportive response to internalizing emotion was significant with -2 log likelihood = 163.35 with a significant main effect of condition (see Supplementary Table 5). The interaction effect between sex and condition was not significant; therefore, the reduced model was run. As shown in Table 13, the reduced model was also significant with -2 log likelihood = 163.77 and a significant main effect of condition, such that mothers in

the food allergy condition were 62% less likely to provide a supportive response to internalizing emotion than mothers in the healthy condition. The odds of mothers' supportive responses to internalizing affect did not differ by sex.

Hypothesis 4: **Mothers in the food allergy condition will be more likely to provide nonsupportive responses to emotion than mothers in the healthy condition.**

Logistic regression models were next used to examine the odds of nonsupportive responses to different emotions. The first model examined differences in the odds of a nonsupportive response to all emotions globally. The initial model was significant with -2 log likelihood = 421.77, a marginal main effect of condition, and a significant main effect of sex (see Supplementary Table 6). The interaction between sex and condition, however, was not significant; therefore, the reduced model was tested. As shown in Table 14, the reduced model was also significant with -2 log likelihood = 423.44. There was again a marginal main effect of condition, such that children in the food allergy group were 1.34 times more likely to receive a nonsupportive response to emotion. The main effect of sex was also significant, such that girls had 1.49 times greater odds of receiving a nonsupportive response for an affective display.

The odds of a nonsupportive response to positive emotion was examined next. As reported in Supplementary Table 6, the initial model was marginally significant with -2 log likelihood = 308.19 and a significant main effect of condition. The interaction between sex and condition was not significant; therefore, the reduced model was run. This model approached significance (i.e., $\chi^2(2) = 5.97$, $p = .051$) with

-2 log likelihood = 309.16. There was a significant main effect of condition, such that mothers in the food allergy condition were 1.65 times more likely to provide a nonsupportive response to positive emotion than mothers with healthy children. The odds of mothers' nonsupportive responses to positive affect did not differ by sex.

The initial model that predicted the odds of a nonsupportive response to externalizing emotion was significant with -2 log likelihood = 135.63 and a significant main effect of sex (see Supplementary Table 6). The interaction effect between sex and condition was not significant; therefore, the reduced model was tested. As shown in Table 14, the reduced model was significant with -2 log likelihood = 135.76. There was a significant main effect of sex, such that girls had 2.75 times greater odds of receiving a nonsupportive response for externalizing emotion. The main effect of condition was not significant in either model.

The final models predicted the odds of a nonsupportive response to internalizing emotion. The initial model was significant with -2 log likelihood = 163.35 and a significant main effect of condition (see Supplementary Table 6). The interaction effect was not significant; therefore, the reduced model was also tested. As shown in Table 14, the reduced model was significant with -2 log likelihood = 163.77, and a significant main effect of condition, such that mothers in the food allergy condition were 2.64 times more likely to provide a nonsupportive response to internalizing emotion than mothers in the healthy condition. The odds of mothers' nonsupportive responses to internalizing affect did not differ by sex.

Hypothesis 5: **Mothers in the food allergy condition with higher protective parenting, state anxiety, and trait anxiety will be less likely to provide supportive**

responses and more likely to provide nonsupportive responses to emotion than mothers with lower scores or in the healthy condition.

The final hypothesis was tested with a series of moderation analyses using multiple logistic regression. The first three models tested the ability of protective parenting, state anxiety, and trait anxiety, respectively, to predict the odds of a supportive response (see Table 15). The second set of three models tested the ability of those variables to predict the odds of a nonsupportive response (see Table 16). In each model, child's sex was included as a covariate. Moderation was tested with the inclusion of an interaction term between condition and either protective parenting, state anxiety, or trait anxiety. Given three models per dependent variable, a Bonferroni correction was again performed yielding $\alpha = .017$ as the adjusted minimum criterion for significance. Marginal effects ($.017 < p < .05$) are also reported.

The first model tested moderation of the effect of protective parenting on the odds of a supportive response to emotion. As shown in Table 15, the model was significant with -2 log likelihood = 421.73 and a significant interaction effect between condition and protective parenting (see Figure 1). Probing the interaction revealed that among mothers of healthy children, as protective parenting increased by one unit, the odds of providing a supportive response increased by 1.44 times. In contrast, among mothers of children with food allergies, as protective parenting increased by one unit, the odds of providing a supportive response decreased by 34%.

The second model tested moderation of the effect of state anxiety on the odds of a supportive response. As shown in Table 15, the model was significant with -2 log

likelihood = 430.67; however, the interaction effect between condition and state anxiety was not significant.

The third model tested moderation of the effect of trait anxiety on the odds of a supportive response. As reported in Table 15, the model was significant with -2 log likelihood = 425.56 and a significant interaction effect between condition and trait anxiety (see Figure 2). Probing the interaction revealed that only among mothers of children with food allergies, each additional unit of trait anxiety predicted a 90% decrease in the odds of a supportive response. Among mothers of healthy children, with each one-unit increase in trait anxiety the odds of a supportive response decreased by 5%.

Next, moderation of the effect of protective parenting on the odds of a nonsupportive response to emotion was tested. As shown in Table 16, the model was significant with -2 log likelihood = 408.53 and a significant interaction effect between condition and protective parenting (see Figure 3). Probing the interaction revealed that among mothers of healthy children, each additional unit of protective parenting predicted a 31% decrease in the odds of a nonsupportive response; however, among mothers of children with food allergies, each additional unit of protective parenting predicted an increase in the odds of a nonsupportive response by 1.38 times.

The final two models tested moderation of the effects of state anxiety and trait anxiety on the odds of a nonsupportive response. Neither model met the Bonferroni-corrected criteria for significance ($p < .017$); however, they each approached significance at $p < .05$. As shown in Table 16, the model for which state anxiety was the primary predictor was marginally significant with -2 log likelihood = 421.59;

however, the interaction effect was not significant. Similarly, the model for which trait anxiety was the primary predictor was marginally significant with -2 log likelihood = 417.36; however, the interaction effect was not significant.

Chapter 4: Discussion

Summary and Interpretation of Study Findings

The findings of this study provide initial support for the assertion that caregivers' emotion socialization practices with medically vulnerable children, particularly children with food allergies, may deserve additional attention. Across children's expressions of emotion globally and with several discrete emotions, there appear to be differences in how mothers respond depending on the child's health status, the mother's dispositional or situational anxiety, and/or the mother's protective parenting tendencies. The degree to which these contextual factors influence emotion-contingent responding and the manner with which they interact is discussed in detail below.

Hypothesis 1: Protective Parenting and Anxiety by Condition

The study's first hypothesis received partial support, such that mothers of children with food allergies reported marginally higher protective parenting than mothers of healthy children. This analysis was slightly underpowered, but able to detect marginal differences in the degree to which mothers reported preference for protective parenting strategies, such as restricting children's social activities after an injury or limiting children's autonomous activities outside of the home. This finding is consistent with the literature which suggests that mothers of medically vulnerable

children—including those with food allergies—report greater protective parenting than mothers of healthy children (e.g., Herbert & Dahlquist, 2008; Pinquart, 2013).

There were, however, no significant differences in state and trait anxiety between groups, which may be evidence to support the notion that protective parenting is a response to the child's health status as opposed to parent characteristics. This lack of differences in maternal anxiety may be due in part to the relatively low level of anxiety observed in community samples. Mothers in the present sample reported state anxiety scores ranging from 35 to 69 and trait anxiety scores between 33 and 76, skewed significantly toward lower scores in both conditions (see Table 4). This is consistent with the normative data collected from healthy adults (Spielberger, Sarason, Strelau, & Brebner, 1991).

Though the literature concerning mothers of children with food allergies tends to find elevated anxiety (e.g., King et al., 2009; Lau et al., 2014), these studies were conducted with mothers caring for older children with food allergies (e.g., ages 8-12). This is the first study to examine state and trait anxiety among mothers caring for younger children (i.e., < 8 years) with food allergies. It is therefore possible that mothers caring for younger children with food allergies experience less anxiety or have not had sufficient time pass to develop increased anxious symptomatology. On the other hand, it is likely that caregiver anxiety would decrease over time as children learn to monitor their own environment and food intake. Perhaps there exists a curvilinear relationship between onset of symptoms and caregiver anxiety, with increasing anxiety during initial adjustment and decreasing adjustment as the child matures.

Another possibility is that mothers of children with food allergies experience similar levels of state and trait anxiety, but that the symptoms take on a different form or function. For example, the content of mothers' worries when caring for a child with food allergies may differ from that of other adults (Cohen et al., 2004); moreover, there is evidence to suggest that mothers' anxiety symptoms such as hypervigilance and behavioral avoidance may be specific to food allergy-related stimuli (Walkner et al., 2015). These symptoms may even be adaptive initially, as mothers are encouraged to be vigilant for allergens in their child's environment and to avoid dangerous exposures. The function in these cases is to protect one's child from very real preventable harms and to protect oneself from the traumatic loss of a child; whereas, anxiety in the general population often manifests more as excessive concern with unlikely negative outcomes of varying intensity (Barlow, 2014). The drawback of anxiety about a child's medical condition is that it could motivate excessive protective behavior that potentially interferes with the child's development of autonomy (Dahlquist et al., 2014; Hullman, Wolfe-Christensen, Meyer, McNall-Knapp, & Mullins, 2010).

Hypothesis 2: Effects of Protective Parenting and Anxiety on Responses

Analysis of the relations between protective parenting, state and trait anxiety, and emotion-contingent responses provided support for the hypothesis that higher protective parenting and anxiety predict lower odds of supportive responses and greater odds of nonsupportive responses to emotions globally for the entire sample. Interestingly, the effect of protective parenting on supportive responding was not significant; however, the effect of protective parenting on *non*supportive responding

was significant and moderated by the child's sex. It was later revealed that the effect of protective parenting on supportive responding also depends also the child's health status. The directionality of this effect is inversely related to condition, which explains why a main effect could not be detected in these initial analyses. This finding will be discussed further in a later section (see Hypothesis 5).

The finding that greater protective parenting marginally predicts nonsupportive responding with girls and not boys was unexpected, but not inconsistent with the literature. In general, parents tend to reinforce expression of positive emotion in both sexes, but differ in socialization of negative emotions (Eisenberg et al., 1998). In many Western cultures, parents tend to discourage externalizing emotion in girls, but reinforce it among boys (Root & Denham, 2010; Chaplin & Aldao, 2013). In the present study, externalizing emotion had the greatest odds of a nonsupportive response, which was predominantly directed toward girls even though boys and girls expressed similar levels of affect (see Table 8 & 12).

In contrast with protective parenting, both state and trait anxiety predicted less supportive responding, but did not have significant main effects on nonsupportive responding. The lack of significant effects of anxiety on nonsupportive responding may be due in part to the lack of power for these analyses and in part to the non-clinical nature of the present sample. That is, a relation between anxiety and nonsupportive emotion-contingent responding may be more prevalent among clinical samples with higher levels of anxiety. This is consistent with the literature regarding anxious parental socialization, which has largely been conducted with clinical

samples or individuals previously diagnosed with an anxiety disorder (e.g., Wheatcroft & Creswell, 2007; Williams et al., 2012).

The finding that state and trait anxiety predict differences in supportive responding suggests that even at non-clinical levels of dispositional and situational anxiety, mothers may be less motivated to reinforce affect—particularly, strong affect. Though the present study was unable to account for affective intensity, it would be consistent with the literature for mothers to provide less support for affective displays perceived to be "too much," or contextually inappropriate. This is part of the normative emotion socialization process through which parents teach their children how to behave in socially acceptable ways, especially in public settings (Eisenberg et al., 1998).

As mothers experience more anxiety, however, they may be more easily distressed by these affective displays or perhaps become more likely to appraise such displays as unacceptable (Bardeen et al., 2014; Creswell et al., 2015). Anxiety may also increase mothers' desire for control over their environment and over their child's behavior, given the importance of perceived control among individuals with anxiety symptoms (Barlow, 2014). If this were the case, we might expect to see a stronger relation between anxiety and nonsupportive responses. This lack of findings may be due in part to the predominance of Neglect as a nonsupportive response. Other responses, such as Punish and Dismiss, involve a greater level of control while Neglect is much more passive. Other studies might consider separating Neglect from other types of nonsupportive responses to examine this relation.

Hypotheses 3 & 4: Mothers' Responses by Condition

Analysis of group differences in supportive and nonsupportive responding found support for the third and fourth hypotheses. Though there were indeed differences in how mothers responded to emotions globally, there were also differences in these effects depending on the type of affect expressed, which suggests that mothers were discriminating between discrete emotions and varying their behavior accordingly.

For example, mothers in both groups responded to externalizing emotion similarly; however, mothers of children with food allergies differed from mothers of healthy children in their responses to positive and internalizing affect. That is, mothers caring for children with food allergies had significantly lower odds of supportive responding *and* greater odds of nonsupportive responding to displays of both positive emotion and internalizing emotion.

There is some evidence to suggest, however, that the degree to which mothers discriminated amongst emotions varied by group. From lag-sequential analysis of emotion-response sequences, it became evident that mothers of healthy children did not make significant use of supportive responses when reacting to children's externalizing emotion. These mothers also did not make significant use of nonsupportive strategies in response to children's internalizing emotion. These results are consistent with the emotion socialization literature with normative populations (Eisenberg et al., 1998; Izard & Ackerman, 2008). Conversely, mothers of children with food allergy made significant use of both supportive and nonsupportive responses with all emotions.

These results in combination with those discussed earlier provide an interesting perspective. Indeed, the literature suggests that *most* parents from Western cultures prefer not to reinforce externalizing affect, particularly from girls (Chaplin & Cole, 2005; Root & Denham, 2010). The findings of the present study suggest that while mothers' responses to externalizing affect may not differ, mothers' responses to positive affect and internalizing affect may indeed differ when caring for a child with food allergies. This finding provides initial support for the study's assertion that emotion socialization practices—and emotion-contingent responding in particular—may manifest differently among families with medically vulnerable children. Few others have examined this phenomenon to date and the present study is the first of its kind to examine emotion socialization among families affected by food allergies.

There are several relevant explanations for the observed group differences in maternal emotion-contingent responding. The study's primary hypothesis—discussed in the next section—posits that these differences may be attributable to differential effects of protective parenting and state anxiety; however, given the lack of significant group differences in levels of state and trait anxiety (see Hypothesis 1), other explanations also merit discussion.

It is important to consider the possibility of a confounding variable with this study design. Analyses of group characteristics ruled out significant group differences in number of siblings, children's age or grade, children's ethnicity, mother's ethnicity, and family's socioeconomic status (see Table 1). The sex distribution of each group was unequal; however, all analyses controlled for the influence of child's sex when examining the effect of child's health status. Unfortunately, given the

absence of true random assignment with this type of study design, other unforeseen differences might exist that could account for differences in emotion socialization practices.

With that in mind, it is possible that mothers in the food allergy group differed due to some variable only tangentially related or perhaps unrelated to their child's food allergies. Perhaps the food allergy group happened to include more working mothers who were busy and eager to return to work. It is also possible that the observed differences had less to do with maternal characteristics and more to do with the child. This would be consistent with the finding that protective parenting, but not anxiety differed by condition. Emotion socialization is often discussed in terms of parental practices; however, there is substantial evidence to suggest that it is a bi-directional process influenced also by the child's input (Eisenberg et al., 1998).

For example, the present study noted that children with food allergies expressed significantly more internalizing affect than healthy children, meaning that mothers in the food allergy group had more opportunities to respond to their child's affect. Though all analyses accounted for differences in affective base rates, it is still worth considering the potential influence of expressive frequency. Mothers whose children expressed a great deal more negative affect may have a different perception of that affect's utility, social acceptability, or impact than mothers who do not need to contend with the same level of expression.

The question remains, why did children with food allergies express more internalizing affect? The literature may be able to shed some light on this matter. Several studies link childhood food allergies with differences in anxiety and mood

symptoms, both cross-sectionally (e.g., King et al., 2009; Patten & Williams, 2009) and longitudinally (e.g., Shanahan, Zucker, Copeland, Costello, & Angold, 2014). It is unclear, however, whether young children with food allergies are at increased risk of meeting clinical criteria for internalizing psychopathology. Shanahan and colleagues (2014) suggest that elevated anxiety in adolescents with food allergy may be an adaptive response to living with food allergy or related to a parent's anxiety, given the prevalence of anxiety among maternal caregivers in the literature.

Hypothesis 5: Moderation of the Effects of Protective Parenting and Anxiety

The study's primary hypothesis was that the effects of protective parenting and anxiety on maternal emotion-contingent responding would depend on the child's health status. This hypothesis received partial support, such that health status moderated the effects of 1) protective parenting on supportive responding, 2) protective parenting on nonsupportive responding, and 3) trait anxiety on supportive responding (see Tables 15 & 16).

As discussed previously, mothers in the food allergy group reported slightly higher protective parenting; therefore, the differential effect of protective parenting on mothers' emotion-contingent responding could be due in part to the relatively higher scores in one group. Recall also that the construct of protective parenting reflects a spectrum of behaviors, such that as protective parenting increases and becomes "excessive" it begins to resemble anxiety symptoms, including hypervigilance and a need for control, which manifest as intrusive and restrictive parenting behaviors. It therefore follows that the relatively greater protective parenting among mothers in the food allergy condition could also reflect mothers'

efforts to control or restrict their child's emotionally expressive behavior. This might reflect a curvilinear relation between protective parenting and maternal responding, such that protective parenting predicts adaptive responses to a point (as we saw in the healthy condition), but becomes associated with nonsupportive responses when excessive.

Indeed, one characteristic of protective parenting is a desire to protect children from physical harms, but also emotional distress (Hardy et al., 1993; Power, 2004). Parents may attempt to shield their child from criticism, negotiate social conflicts for the child, and limit the child's exposure to failure or other emotionally unpleasant situations (Power, 2004). Another way in which this protective behavior could manifest is in the parent's response to the child's emotional distress—presumably by trying to discourage that affect, which could explain why protective parenting predicted less supportive responding and more nonsupportive responding in the present study. These findings could reflect mothers' implicit or explicit efforts to avoid reinforcing or to discourage certain types or intensities of affect.

In contrast, health condition did not significantly moderate the effects of state anxiety on mothers' responses, which suggests that the main effect of state anxiety does not depend on the child's health condition. Recall also that in previous analyses, higher state anxiety predicted less supportive responding for the full sample and levels of state anxiety did not differ significantly between groups. The combination of these findings suggests that mothers experienced comparable levels of situational anxiety regardless of their child's health and that the function of state anxiety with regard to emotion-contingent responding did not differ.

Health status did, however, moderate the effect of trait anxiety on supportive emotion-contingent responding. Although the level of self-reported trait anxiety did not significantly differ between groups, its main effect on emotion-contingent supportive responding did, which suggests that some aspect of dispositional anxiety functioned differently among mothers caring for children with food allergies. As discussed in an earlier section, one possible explanation for the effect of anxiety on supportive responding is a difference in the form or function of anxiety with medically vulnerable children.

There are valid reasons for mothers caring for children with food allergies to be vigilant for environmental threats (e.g., allergens), avoid situations perceived to be unsafe (e.g., restaurants with cross-contamination), and to seek additional control over the environment (e.g., meal-planning, carrying an epi-pen, having "allergen-free" areas). Moreover, the mother in these situations is attempting to manage risk to her child—another semi-autonomous human being whose actions may be unpredictable and at times difficult to control. Parenting any child is itself a stressful and anxiety-provoking task. Doing so for a child at constant risk of allergic or anaphylactic episodes is that much more challenging. What might begin as an adaptive response to a child's diagnosis could eventually become a maladaptive pattern maintained by the same factors that maintain typical anxiety symptoms.

Like protective parenting, trait anxiety could also manifest with efforts to control children's expression of emotion; however, anxiety may differ from protective parenting in one important way. Protective parenting is other-focused, motivated by a desire to prevent negative outcomes or distressing affect for one's

child (Power, 2004). Anxiety, however, tends to be more self-focused and may therefore be motivated by a desire to prevent or alleviate one's own distress (Barlow, 2014; Tiwari et al., 2008). An adult who experiences anxiety often as part of their disposition may be particularly susceptible to this intolerance of distress, which could explain why trait anxiety, but not state anxiety predicted less supportive emotion-contingent responding among mothers in the food allergy condition.

Strengths

The present study addresses several gaps in the literature. To date, few studies have examined the correlates of protective parenting and anxiety among mothers caring for children with food allergies (e.g., Lau et al., 2014; LeBovidge et al., 2009). Of those that have, few included children younger than eight years of age (e.g., Chow et al., 2015; Dahlquist et al., 2014). That is surprising given that food allergies typically develop during infancy to early childhood and the years immediately following diagnosis are a period of significant lifestyle change for affected families (Savage & Johns, 2015; Walkner et al., 2015). Caregivers' wellbeing during this time merits further attention and parenting practices with young children with food allergies is an area in need of further study. No studies to date have examined parental emotion socialization during the period following a child's diagnosis with food allergies. The present study addresses this need by establishing that a relationship exists between childhood food allergy and maternal caregivers' emotion-contingent responding.

Another potential contribution of the present study is its characterization of a process that may play a role in the development of anxiety in children with food

allergies. It is not uncommon in the developmental psychopathology literature to see intergenerational transmission of mothers' anxiety to their children (Ollendick & Benoit, 2012; Rapee, 2001; Thompson-Hollands et al., 2014). Emotion socialization is hypothesized to be one way in which anxious mothers inadvertently reinforce children's anxious behavior (Dougherty et al., 2013; Edwards et al., 2010; Suveg et al., 2011). Food allergy caregiving may be similarly related to emotion socialization of anxiety, though this hypothesis has not yet been tested and is an area for future study.

The present study's findings are bolstered by several methodological strengths. First, the use of theoretically-derived and previously validated coding systems increases confidence in the quality and consistency of behavioral data collected for this study. The use of a partially-crossed coding design helped to maximize reliability and validity of these coding systems. Though inter-rater reliability obtained by the coding team was moderate, the majority of disputed codes were omissions rather than code confusion, which suggests that the coding system did not suffer from conceptual overlap or code specificity issues. Omissions might be considered a less severe error for the present study, considering the interactional nature of the video-recorded task. That is, behaviors that could not be detected by trained observers were possibly too subtle to have influenced mother-child interactions and thus irrelevant to the study's aims. These data were collected and coded by a diverse and well-trained team of undergraduate and graduate research assistants using procedural blinding to limit the introduction of researcher or observer

biases. These measures further increase confidence in the accuracy and validity of this study's findings.

The present study's statistical methods may also be considered a strength. First, the use of lag-sequential analyses to describe interactional data increases the likelihood that observational methods were able to capture true behavioral patterns—taking into account each behavior's base rate and order of occurrence. Binomial logistic regressions were another particularly robust tool, given the often non-parametric and heteroscedastic nature of behavioral data. The ability to examine transitional count data and derive probabilities appropriate for regression analyses was invaluable for testing the study's hypotheses.

Limitations & Future Directions

Though the present study had many strengths, there were also a number of conceptual and methodological factors that could be improved upon in future studies. First, it was beyond the scope of the present study to examine a temporal pathway from maternal anxiety to childhood anxiety through emotion socialization. Parental emotion socialization begins as early as infancy and is believed to peak in early childhood (Eisenberg et al., 1998), yet anxiety tends to manifest later as children approach adolescence (Izard, Youngstrom, Fine, Mostow, & Trentacosta, 2006; Rapee, 2001).

Longitudinal investigation will be needed to capture the sequence of events from early emotional development to later anxious adjustment. To that end, one limitation of the present study is its cross-sectional design. This approach does not permit examination of a temporal sequence from children's food allergy diagnosis to

mothers' emotion-contingent responding to the development of children's anxiety. Nevertheless, future studies might examine anxiety development in children with food allergies using insights gained from the present study's findings and methods.

As a secondary data analysis, the present study is also constrained by the sample size and methods of the original study, with the exception of the observational coding methods (see Appendices A and B) that were added exclusively for the present research. Though the use of pre-collected data may have been beneficial in some ways—for example, it curtails introduction of the present investigator's biases and is more cost-effective—there are also a number of limitations of this approach.

One drawback is that unaddressed threats to the reliability and validity of the original study persisted for the present study as well. To that end, the original study failed to recruit equal proportions of boys and girls for each condition; therefore, sex moderation could not be examined. Another drawback is that the present study's generalizability was be limited to predominantly White, middle to upper-middle class families from the United States' east coast. Generalizability was additionally constrained by the original exclusion criteria. Though these criteria may have prevented certain threats to validity (i.e., confounding), external validity may have been further reduced. Future studies might consider capturing a greater breadth of diverse individuals and contexts to increase the generalizability of their findings.

Another limitation worth mention is the present study's entirely maternal sample. Though mothers may be uniquely affected by children's food allergies and often take on the primary caregiver role there is sure to be considerable variation in each caregiver's involvement (King et al., 2009; LeBovidge et al., 2009). Moreover,

other caregivers including fathers and non-traditional primary caregivers contribute substantially to the emotion socialization process and are often overlooked (Eisenberg et al., 1998). Studies often find that primary caregivers are not homogenous, but engage in distinct parenting and emotion socialization processes (Root & Denham, 2010). Studies that include all primary caregivers and can conduct comparisons amongst them are valuable and few in number.

The two observational coding systems introduced for the present study also possessed some limitations. First, both coding systems utilize global codes that may not capture the full range of human emotion and maternal responsiveness that can occur. The use of a few representative codes yields a more manageable and reliable coding system, but runs the risk of missing important variation that could be captured with a more granular level of observation (Bakeman & Gottman, 1997). Second, a limitation inherent to any observational study is the potential to capture an artifact, rather than a persistent pattern of behavior. The relatively contrived nature of the observational task and environment may have influenced how mothers and children behaved; thus, the observed interactions may not have been representative of their *in situ* behavior. Recording some footage in family's naturalistic settings could address this issue.

Another limitation of the present study is the relatively short time frame during which children's affect and mothers' responses could be captured. The methods and analyses used were appropriate for low-frequency events; however, there was not sufficient power to examine moderation by affective intensity. Future studies should endeavor to examine maternal emotion socialization with multiple

methods, using more granular observational systems, and with longer observational periods during which higher frequencies of each behavior may be obtained. Varying the types of tasks with which participants engage is another possible solution, as some tasks may elicit more frequent, more intense, or different types of emotion than others. Different tasks might also elicit greater effects of anxiety or protective parenting. For example, tasks involving greater risk such as an athletic task may prompt greater protective parenting than a cognitive task such as a puzzle.

One final limitation is the study's narrow focus in terms of emotion socialization. Parents' operant responses to emotions are only one mechanism through which children's emotional expression may be shaped. Other emotion socialization processes include modeling of affective expression, labeling emotions, discussion of emotions, direct didactic instruction about emotions, and facilitation of the family's emotional climate (Eisenberg et al., 1998; Ellis et al., 2014; Root & Denham, 2010). Though the present study provided evidence of differences in operant management of children's emotional behavior among families affected by food allergy, it is not clear whether similar differences exist in other forms of emotion-related socialization behavior.

Implications

The present study provided novel evidence of parenting and emotion socialization differences among mothers caring for children with food allergies, with potential inputs from maternal anxiety and protective parenting; however, further study will be needed to clarify the directionality and sequence of these associations and how they might apply to family functioning and children's socioemotional

development. For the moment, there are few direct applications of this research; however, one possibility is that mothers might benefit from additional discussion with healthcare providers about appropriate management of their child's food allergy.

The present study's findings raise important questions about families' needs following a food allergy diagnosis. The literature suggests that maternal caregivers in such families experience greater daily stress, higher anxiety, poorer quality of life, and greater preference for protective parenting strategies (Bollinger et al., 2006; King et al., 2009; Lau et al., 2014; Pinquart, 2013). With that in mind, this study's findings—that aspects of protective parenting and anxiety predict differences in how mothers respond to their child's emotions when they have a diagnosed food allergy—suggests that these families may need more ongoing support as they adapt parenting strategies to the challenges posed by food allergy.

Perhaps healthcare professionals should screen mothers of medically vulnerable children or children with food allergies for elevated anxiety. Clinicians might also discuss protective parenting strategies with caregivers to identify measures that would be most adaptive for the child in their developmental context. Mothers might also benefit from additional education about their child's food allergy condition and the level of risk involved when properly managed, as this is something that previous studies have shown to be deficit (e.g., Joshi et al., 2002). In any case, as the knowledge base surrounding family management of children's food allergies improves, clinicians might approach childhood food allergy from a family systems perspective and consider how one family member's difficulty with a diagnosis (and not necessarily the patient) could influence the health and wellbeing of the others.

Table 1.

Demographics of Food Allergy and Healthy Control Groups

	Frequencies (*N*)			
Demographic Variable	Healthy	Food Allergy	χ^2	*p*-value
Child Sex			7.82**	.005
Male	27	42		
Female	40	23		
Child Grade			3.15	.370
Preschool	39	32		
Kindergarten	14	17		
1st Grade	9	5		
Not in School	5	9		
Child Ethnicity			3.66	.454
African American	8	5		
Caucasian	51	51		
Latino	2	1		
Asian	4	2		
Other	2	6		
Mother Ethnicity				
African American	9	6	1.77	.621
Caucasian	54	54		
Latino	0	0		
Asian	3	3		
Other	1	2		
Socioeconomic Status[a]			2.01	.570
Lowest (8 – 19)	0	0		
Lower (20 – 29)	1	1		
Middle (30 – 39)	3	5		
Higher (40 – 54)	16	21		
Highest (55 – 60)	42	34		

Note. *$p < .05$, **$p < .01$, ***$p < .001$; [a]Hollingshead Index of Socioeconomic Status, composites based on parents' self-reported occupations and educational attainment.

Table 2.

Maternal Perceived Severity and Worry by Allergen Type

	Perceived Severity				Maternal Worry			
Allergen	*M*	*SD*	Skew	Kurtosis	*M*	*SD*	Skew	Kurtosis
Peanut	5.08	1.77	-0.66	-0.66	5.20	1.88	-0.62	-0.98
Tree Nut	4.78	1.92	-0.45	-0.84	5.02	1.82	-0.49	-0.73
Milk	4.40	2.02	-0.07	-1.24	4.60	1.63	-0.10	-0.33
Soy	3.60	1.95	-0.08	-0.82	4.00	2.19	0.17	-0.78
Eggs	4.56	1.58	-0.30	-0.37	4.97	1.70	-0.56	-0.09
Wheat	4.00	1.41	0.00	-0.30	3.86	1.46	0.34	-1.54
Other Grains	5.00	0.00	--	--	3.33	2.52	0.59	--
Shellfish	4.16	1.74	0.37	-0.60	4.15	1.79	0.37	-0.58
Scaled Fish	4.78	2.04	-0.52	-0.19	4.00	2.21	0.08	-0.19
Fruit	3.20	1.93	0.92	-0.21	3.55	1.86	0.59	-0.48
Vegetables	2.33	0.58	1.73	--	2.00	1.15	0.00	--
Other	3.68	2.16	0.49	-1.08	3.60	1.93	0.54	-0.71

Note. Ratings ranged from 1 (Very Mild, Not Worried) to 7 (Very Severe, Very Worried).

Table 3.

Transitional Frequency Matrix of Children's Affect and Mothers' Responses

	Maternal Response	
Child's Affect	Supportive	Nonsupportive
All Emotion	580	262
Positive Emotion	281	136
Externalizing Emotion	85	66
Internalizing Emotion	214	60

Note. Transitional frequencies of emotion-response sequences. By convention, cells are read as (Row, Column) to mean that the "row" code preceded the "column" code as frequently as indicated by the value in that cell.

Table 4.

Descriptive Information for Protective Parenting, State Anxiety, and Trait Anxiety

	Healthy				Food Allergy			
Interaction	Mean (SD)	Range	Skew	Kurtosis	Mean (SD)	Range	Skew	Kurtosis
Protective Parenting	2.52 (0.66)	1 - 5	0.14	0.47	2.74 (0.71)	1 - 5	-0.12	-0.76
State Anxiety	41.82 (6.67)	35 - 63	1.29	1.52	43.42 (6.88)	35 - 69	1.36	2.56
Log-Transformed State Anxiety	3.72 (0.15)	3.6 - 4.1	0.94	0.41	3.76 (0.15)	3.6 - 4.2	0.88	0.86
Trait Anxiety	46.67 (9.11)	33 - 76	0.92	1.20	47.03 (7.94)	34 - 66	0.57	-0.20
Log-Transformed Trait Anxiety	3.83 (0.19)	3.5 - 4.3	0.40	-0.20	3.84 (0.17)	3.5 - 4.2	0.25	-0.59

Note. Raw and log-transformed descriptive summary of protective parenting, state anxiety, and trait anxiety by condition.

Table 5.

Transitional Frequencies and Means of Affective Displays

	Healthy				Food Allergy			
Total	Mean (SD)	Range	Skew	Kurtosis	Mean (SD)	Range	Skew	Kurtosis
All Emotions	5.46 (4.06)	0 - 17	0.85	0.08	7.11 (4.88)	0 - 23	0.54	0.06
Positive Emotion	2.91 (1.97)	0 - 11	1.23	0.69	3.45 (2.54)	0 - 13	1.11	2.10
Externalizing Emotion	1.03 (1.17)	0 - 4	1.12	0.54	1.12 (1.72)	0 - 10	1.72	10.97
Internalizing Emotion	1.52 (1.84)	0 - 12	2.98	15.05	2.54 (3.04)	0 - 20	3.04	16.17

Note. Descriptive information provided for untransformed transitional frequencies of affective displays.

Table 6.

Transitional Frequencies and Means for Emotion-Supportive Mother-Child Interactions

	Healthy				Food Allergy			
Interaction	Mean (SD)	Range	Skew	Kurtosis	Mean (SD)	Range	Skew	Kurtosis
Emotional Antecedents to Supportive Responses								
All Emotions	4.28 (3.43)	0 - 15	1.43	1.92	4.76 (3.57)	0 - 15	0.64	-0.20
Positive Emotion	2.09 (2.42)	0 - 10	1.74	2.97	2.12 (1.87)	0 - 10	1.59	3.91
Externalizing Emotion	0.49 (0.80)	0 - 3	1.73	2.51	0.72 (1.40)	0 - 8	3.03	11.77
Internalizing Emotion	1.33 (1.57)	0 - 9	2.12	7.56	1.83 (2.31)	0 - 14	2.58	10.99

Note. Descriptive information provided for untransformed transitional frequencies of maternal responses to emotional antecedents.

Table 7.

Transitional Frequencies and Means for Emotion-Nonsupportive Mother-Child Interactions

	Healthy				Food Allergy			
Interaction	Mean (SD)	Range	Skew	Kurtosis	Mean (SD)	Range	Skew	Kurtosis
Emotional Antecedents to Nonsupportive Responses								
All Emotions	1.67 (1.77)	0 - 8	1.44	2.40	2.38 (2.25)	0 - 8	0.97	0.19
Positive Emotion	0.82 (1.34)	0 - 6	2.26	5.09	1.32 (1.74)	0 - 9	1.94	5.13
Externalizing Emotion	0.54 (0.82)	0 - 4	1.90	4.39	0.40 (0.68)	0 - 3	1.76	2.87
Internalizing Emotion	0.19 (0.53)	0 - 3	3.35	12.97	0.70 (1.16)	0 - 6	2.29	6.59

Note. Descriptive information provided for untransformed transitional frequencies of maternal responses to emotional antecedents.

Table 8.

Lag-Sequential Statistics for Emotion-Response Contingencies

	Healthy				Food Allergy			
Interaction	P_t	z	p	Yule's Q	P_t	z	p	Yule's Q
Emotional Antecedents to Supportive Responses								
Positive Emotion	.72	3.91***	.000	.79	.63	3.87***	.000	.69
Externalizing Emotion	.48	-0.48	.210	.27	.63	3.56*	.029	.59
Internalizing Emotion	.87	8.16***	.000	.90	.73	7.23***	.000	.78
Emotional Antecedents to Nonsupportive Responses								
Positive Emotion	.28	6.52***	.000	.59	.37	8.48***	.000	.66
Externalizing Emotion	.52	10.98***	.000	.81	.37	5.71***	.000	.54
Internalizing Emotion	.13	0.09	.252	-.08	.27	4.16**	.007	.39

Note. $^{\dagger}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$. Sequential statistics include the following: P_t = transitional probability of sequence relative to chance, z = adjusted residual, p = significance of the adjusted residual, Yule's Q = measure of effect size ranging from 0 to 1.

Table 9.

Two-Way ANOVAs of Protective Parenting and State-Trait Anxiety by Condition

Model	*F*(*df*)	*p*-value	η_p^2
1. *Protective Parenting*			
Corrected Model	*F*(3,126) = 2.40	.071†	.054
Child's Sex	*F*(1,126) = 0.08	.783	.001
Condition	*F*(1,126) = 7.17	.008*	.054
Sex*Condition	*F*(1,126) = 3.68	.058†	.028
2. *State Anxiety*			
Corrected Model	*F*(3,128) = 1.36	.258	.031
Child's Sex	*F*(1,128) = 0.75	.388	.006
Condition	*F*(1,128) = 3.68	.057†	.028
Sex*Condition	*F*(1,128) = 1.13	.289	.009
3. *Trait Anxiety*			
Corrected Model	*F*(3,127) = 0.68	.566	.016
Child's Sex	*F*(1,127) = 0.03	.856	.000
Condition	*F*(1,127) = 1.53	.218	.012
Sex*Condition	*F*(1,127) = 1.83	.179	.014

Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. State Anxiety and Trait Anxiety were log-transformed to normality prior to analysis. For each model, Levene's tests of equality of error variances were not significant and thus homoscedasticity was assumed.

Table 10.

Binomial Logistic Regressions Predicting Emotion-Supportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(2) = 3.41$	.182	-
Intercept	1.04	$\chi^2(1) = 98.46$***	.000	2.81
Child's Sex	0.20	$\chi^2(1) = 1.73$	.189	1.22
Protective	-0.15	$\chi^2(1) = 1.79$	.181	0.86
2. *State Anxiety*				
Model	-	$\chi^2(2) = 9.59$*	.008	-
Intercept	5.87	$\chi^2(1) = 100.41$***	.000	335.14
Child's Sex	1.79	$\chi^2(1) = 1.79$	.181	1.23
State Anxiety	-1.40	$\chi^2(1) = 7.52$*	.006	0.25
3. *Trait Anxiety*				
Model	-	$\chi^2(2) = 7.14^{\dagger}$	.028	-
Intercept	4.38	$\chi^2(1) = 99.41$***	.000	80.13
Child's Sex	0.24	$\chi^2(1) = 2.46$	.117	2.75
Trait Anxiety	-0.98	$\chi^2(1) = 5.06^{\dagger}$	.025	1.51

Note. $^{\dagger}p < .05$, $*p < .017$, $**p < .003$, $***p < .0003$. Models with interaction effects at $p < .05$ were re-run with the interaction term excluded. See Supplementary Table 3 for initial models.

Table 11.

Binomial Logistic Regressions Predicting Emotion-Nonsupportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(3) = 9.10^{\dagger}$	.028	-
Intercept	-0.51	$\chi^2(1) = 104.49$***	.000	0.60
Child's Sex	-0.99	$\chi^2(1) = 2.40$	.121	0.37
Protective	-0.17	$\chi^2(1) = 3.88^{\dagger}$	.049	0.85
Sex*Protective	0.49	$\chi^2(1) = 4.47^{\dagger}$	.035	1.64
2. *State Anxiety*				
Model	-	$\chi^2(2) = 6.73^{\dagger}$	.035	-
Intercept	-3.25	$\chi^2(1) = 116.36$***	.000	0.04
Child's Sex	-0.33	$\chi^2(1) = 4.68^{\dagger}$	.030	0.72
State Anxiety	0.70	$\chi^2(1) = 1.83$	.177	2.01
3. *Trait Anxiety*				
Model	-	$\chi^2(2) = 6.15^{\dagger}$	.046	-
Intercept	-2.54	$\chi^2(1) = 114.44$***	.000	0.08
Child's Sex	-0.35	$\chi^2(1) = 5.14^{\dagger}$	.023	0.70
Trait Anxiety	0.50	$\chi^2(1) = 1.28$	.258	1.65

Note. $^{\dagger}p < .05$, $*p < .017$, $**p < .003$, $***p < .0003$. Models with interaction effects at $p < .05$ were re-run with the interaction term excluded. See Supplementary Table 4 for initial models.

Table 12.

Binomial Logistic Regressions Predicting Affective Displays

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Positive Emotion*				
Model	-	$\chi^2(2) = 3.06$	.216	-
Intercept	0.06	$\chi^2(1) = 0.11$	.746	1.06
Child's Sex	0.16	$\chi^2(1) = 1.18$	.277	1.17
Condition	-0.22	$\chi^2(1) = 2.45$	.118	0.80
2. *Externalizing Emotion*				
Model	-	$\chi^2(2) = 1.81$	.405	-
Intercept	-1.40	$\chi^2(1) = 368.94$***	.000	0.25
Child's Sex	-0.13	$\chi^2(1) = 0.47$	.491	0.88
Condition	-0.19	$\chi^2(1) = 0.98$	.322	0.83
3. *Internalizing Emotion*				
Model	-	$\chi^2(2) = 6.16$*	.046	-
Intercept	-0.91	$\chi^2(1) = 106.80$***	.000	0.40
Child's Sex	-0.09	$\chi^2(1) = 1.39$	.544	0.91
Condition	0.38	$\chi^2(1) = 6.15$*	.013	1.47

Note. $^{\dagger}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$.

Table 13.

Binomial Logistic Regressions of Emotion-Supportive Responses by Condition

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Support: All Emotion*				
Model	-	$\chi^2(3) = 11.72$**	.008	-
Intercept	0.66	$\chi^2(1) = 108.59$***	.000	1.94
Child's Sex	0.63	$\chi^2(1) = 4.60$**	.032	1.88
Condition	-0.08	$\chi^2(1) = 5.48$**	.019	0.93
Sex*Condition	-0.58	$\chi^2(1) = 3.41^{\dagger}$	.065	0.56
2. *Support: Positive Emotion*				
Model	-	$\chi^2(2) = 5.97^{\dagger}$	.051	-
Intercept	0.82	$\chi^2(1) = 43.56$***	.000	2.27
Child's Sex	0.23	$\chi^2(1) = 1.09$	.296	1.25
Condition	-0.50	$\chi^2(1) = 5.53$*	.019	0.61
3. *Support: Externalizing Emotion*				
Model	-	$\chi^2(2) = 11.80$**	.003	-
Intercept	-0.50	$\chi^2(1) = 1.44$	.231	0.61
Child's Sex	1.01	$\chi^2(1) = 7.83$**	.005	2.75
Condition	0.41	$\chi^2(1) = 1.26$	.262	1.51
4. *Support: Internalizing Emotion*				
Model	-	$\chi^2(2) = 8.91$*	.012	-
Intercept	1.93	$\chi^2(1) = 95.73$***	.000	6.91
Child's Sex	-0.02	$\chi^2(1) = 0.00$	.952	0.98
Condition	-0.97	$\chi^2(1) = 8.42$**	.004	0.38

Note. $^{\dagger}p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. Models with interaction effects at $p < .10$ were re-run with the interaction term excluded.

Table 14.

Binomial Logistic Regressions of Emotion-Nonsupportive Responses by Condition

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Nonsupport: All Emotion*				
Model	-	$\chi^2(2) = 8.37$*	.015	-
Intercept	-0.76	$\chi^2(1) = 119.87$***	.000	0.47
Child's Sex	-0.40	$\chi^2(1) = 6.54$*	.011	0.67
Condition	0.29	$\chi^2(1) = 3.47^{\dagger}$	.062	1.34
2. *Nonsupport: Positive Emotion*				
Model	-	$\chi^2(2) = 5.97^{\dagger}$	.051	-
Intercept	-0.82	$\chi^2(1) = 41.05$***	.000	0.44
Child's Sex	-0.23	$\chi^2(1) = 1.09$	.296	1.65
Condition	0.50	$\chi^2(1) = 5.45$*	.020	0.80
3. *Nonsupport: Externalizing Emotion*				
Model	-	$\chi^2(2) = 11.80$**	.003	-
Intercept	0.50	$\chi^2(1) = 1.44$	.231	1.65
Child's Sex	-1.01	$\chi^2(1) = 7.83$**	.005	0.36
Condition	-0.41	$\chi^2(1) = 1.26$	.262	0.66
4. *Nonsupport: Internalizing Emotion*				
Model	-	$\chi^2(2) = 8.91$**	.012	-
Intercept	-1.93	$\chi^2(1) = 68.98$***	.000	0.15
Child's Sex	0.02	$\chi^2(1) = 0.00$	.962	1.02
Condition	0.97	$\chi^2(1) = 7.63$**	.006	2.64

Note. $^{\dagger}p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. Models with interaction effects at $p < .10$ were re-run with the interaction term excluded.

Table 15.

Moderation of Protective Parenting and Anxiety on Emotion-Supportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(4) = 20.01$**	.000	-
Intercept	0.22	$\chi^2(1) = 99.34$***	.000	1.24
Child's Sex	-0.34	$\chi^2(1) = 4.51^{\dagger}$	.034	1.00
Protective	0.37	$\chi^2(1) = 7.37$*	.004	1.44
Condition	1.63	$\chi^2(1) = 6.43$*	.011	5.12
Protect*Condition	-0.78	$\chi^2(1) = 3.41$**	.001	0.46
2. *State Anxiety*				
Model	-	$\chi^2(4) = 18.15$**	.001	-
Intercept	2.97	$\chi^2(1) = 67.31$**	.000	19.45
Child's Sex	-0.32	$\chi^2(1) = 4.19^{\dagger}$	.041	0.72
State Anxiety	-0.50	$\chi^2(1) = 3.53$	.060	0.61
Condition	6.07	$\chi^2(1) = 2.43$	.119	432.75
State*Condition	-1.73	$\chi^2(1) = 2.74$	.098	0.18
3. *Trait Anxiety*				
Model	-	$\chi^2(4) = 20.39$**	.000	-
Intercept	1.36	$\chi^2(1) = 89.52$***	.000	3.89
Child's Sex	-0.39	$\chi^2(1) = 5.88$*	.015	0.68
Trait Anxiety	-0.05	$\chi^2(1) = 7.30$*	.007	0.95
Condition	8.11	$\chi^2(1) = 5.53^{\dagger}$	.019	3337.55
Trait*Condition	-2.22	$\chi^2(1) = 6.14$*	.013	0.11

Note. $^{\dagger}p < .05$, $*p < .017$, $**p < .003$, $***p < .0003$.

Table 16.

Moderation of Protective Parenting and Anxiety on Emotion-Nonsupportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(4) = 16.45$**	.002	-
Intercept	-0.25	$\chi^2(1) = 114.64$***	.000	0.78
Child's Sex	0.43	$\chi^2(1) = 7.32$*	.007	1.54
Protective	-0.37	$\chi^2(1) = 4.85^{\dagger}$	.028	0.69
Condition	-1.48	$\chi^2(1) = 5.24^{\dagger}$	.022	0.23
Protect*Condition	0.69	$\chi^2(1) = 3.41$*	.004	2.00
2. *State Anxiety*				
Model	-	$\chi^2(4) = 10.22^{\dagger}$	.037	-
Intercept	-2.85	$\chi^2(1) = 89.91$***	.000	0.08
Child's Sex	0.40	$\chi^2(1) = 6.45$*	.011	1.50
State Anxiety	0.45	$\chi^2(1) = 0.28$	.598	1.57
Condition	1.35	$\chi^2(1) = 0.12$	.731	0.26
State*Condition	0.44	$\chi^2(1) = 0.17$	.676	1.55
3. *Trait Anxiety*				
Model	-	$\chi^2(4) = 11.54^{\dagger}$	.021	-
Intercept	-1.38	$\chi^2(1) = 108.61$***	.000	0.25
Child's Sex	0.45	$\chi^2(1) = 7.78$*	.005	1.57
Trait Anxiety	0.05	$\chi^2(1) = 1.84$	.175	1.05
Condition	-3.98	$\chi^2(1) = 1.32$	.250	0.02
Trait*Condition	1.12	$\chi^2(1) = 1.54$	.215	3.06

Note. $^{\dagger}p < .05$, $*p < .017$, $**p < .003$, $***p < .0003$.

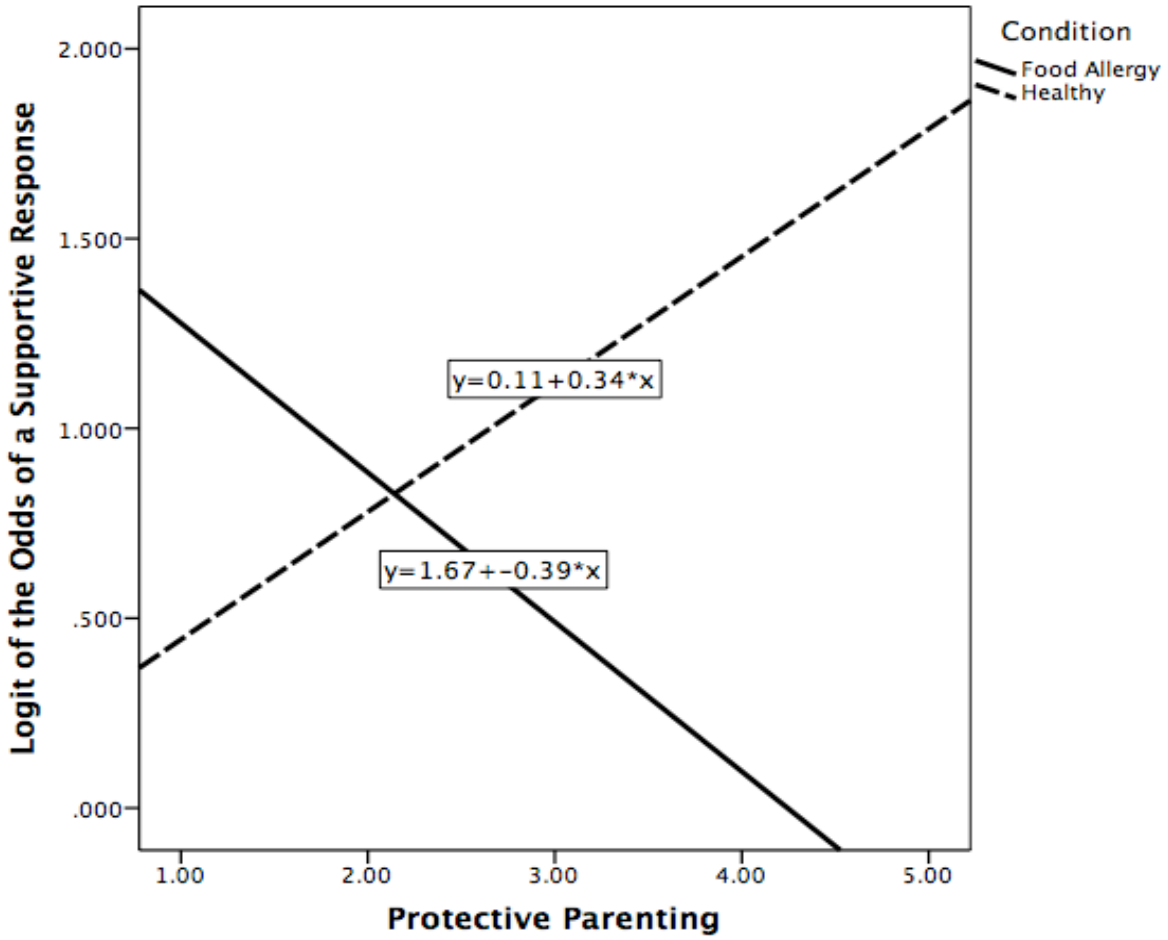

Figure 1. Moderation of Protective Parenting and Mothers' Emotion-Supportive Responses

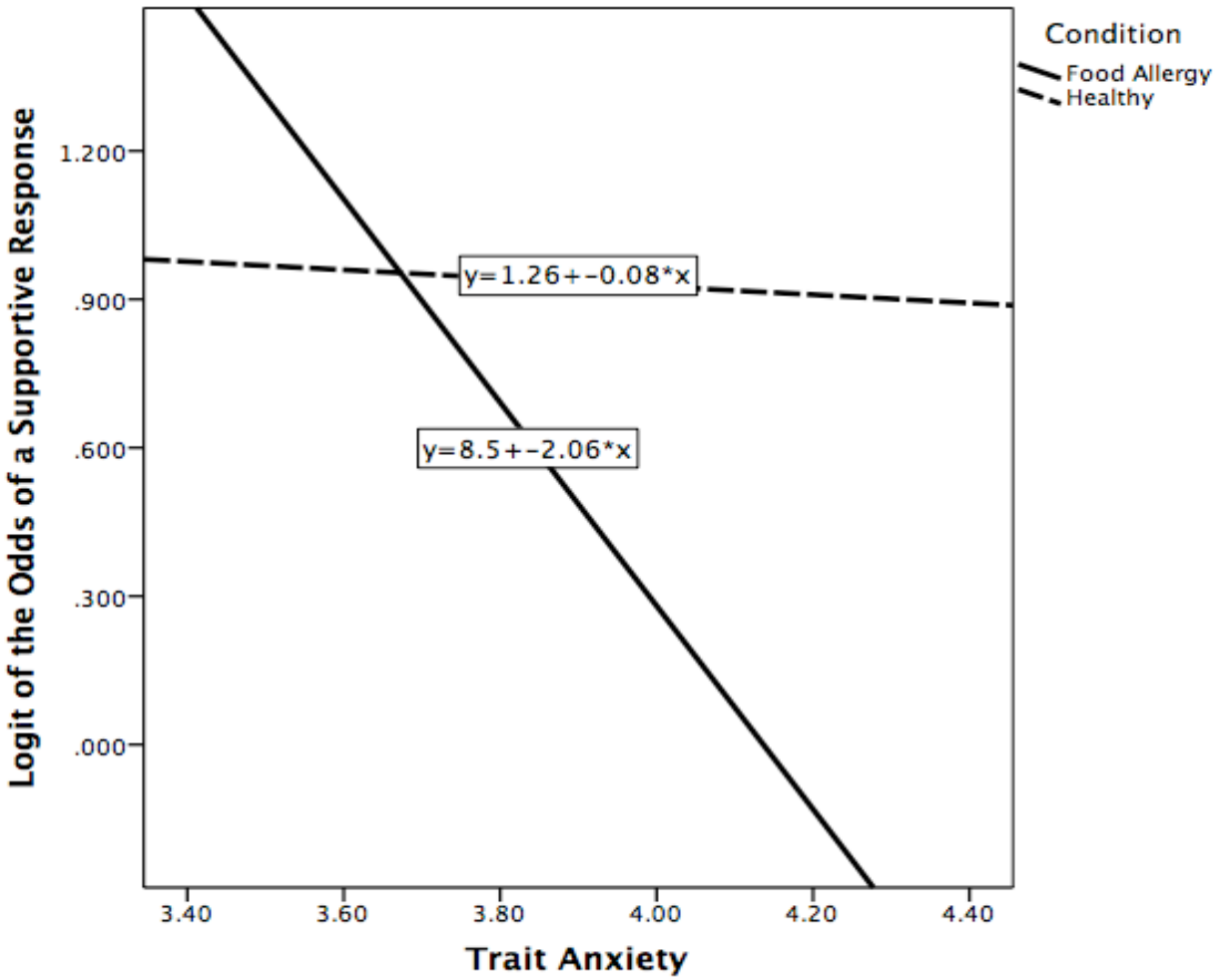

Figure 2. Moderation of Trait Anxiety and Mothers' Emotion-Supportive Responses

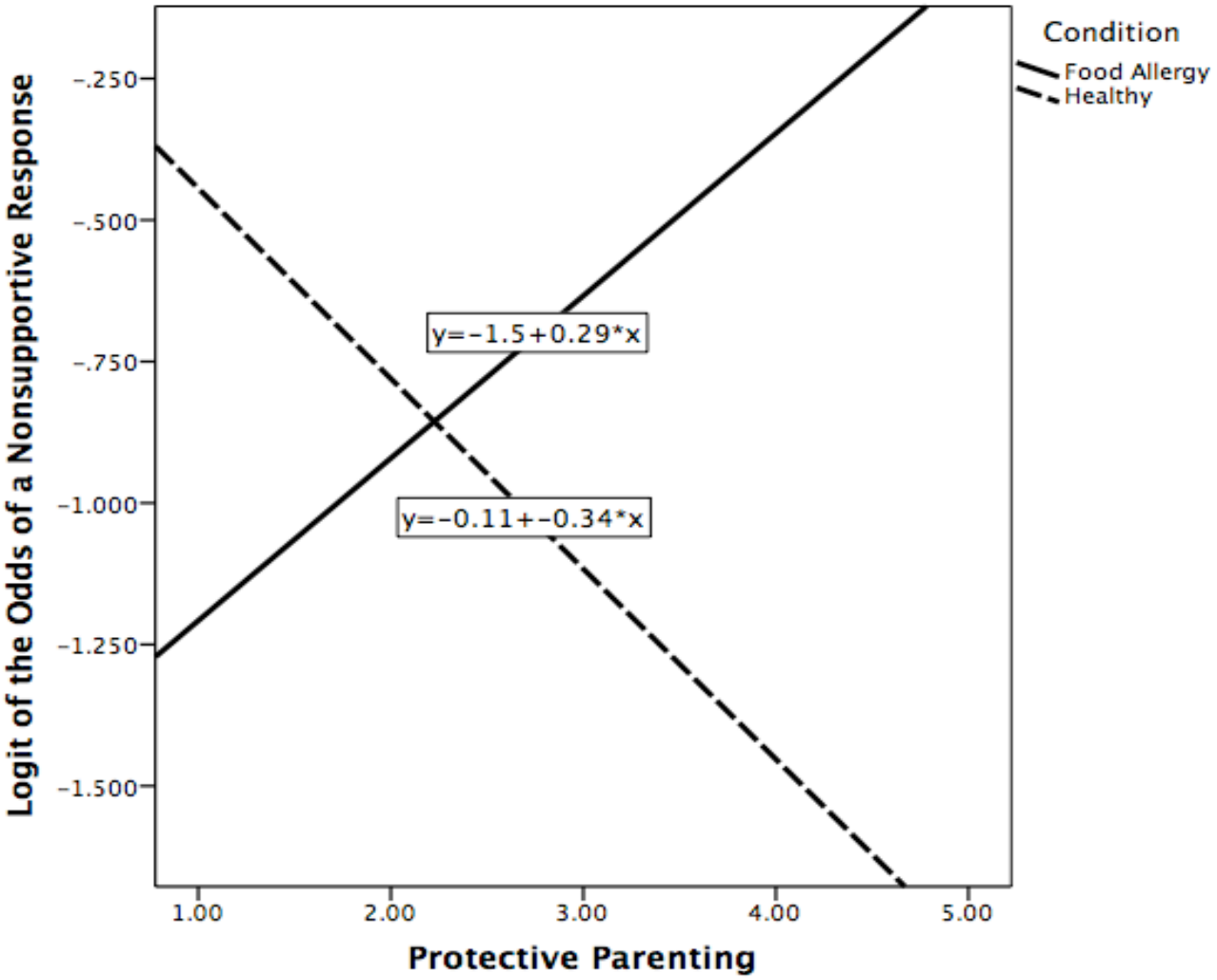

Figure 3. Moderation of Protective Parenting and Mothers' Emotion-Nonsupportive Responses

Appendices

Appendix A. Supplementary Tables & Figures

Supplementary Table 1.

Frequencies of Observational Codes by Condition

Observational Code	Healthy	Food Allergy	Total
Child Emotion Codes			
1. Happy	193	223	417
2. Sad	63	77	140
3. Angry/Frustrated	70	66	153
4. Anxious/Worried	38	89	127
Mother Response Codes			
5. Ignore/Neglect	92	140	232
6. Reward	231	260	491
7. Dismiss	9	17	26
8. Distract	33	55	88
9. Punish	1	3	4
10. Magnify	1	1	2

Note. Raw frequencies of original observational codes by condition.

Supplementary Table 2.

Frequencies of Observational Codes by Child's Sex

Observational Code	Male	Female	Total
Child Emotion Codes			
1. Happy	242	175	417
2. Sad	64	76	140
3. Angry/Frustrated	79	74	153
4. Anxious/Worried	75	52	127
Mother Response Codes			
5. Ignore/Neglect	117	115	232
6. Reward	281	210	491
7. Dismiss	14	12	26
8. Distract	61	27	88
9. Punish	2	2	4
10. Magnify	1	1	2

Note. Raw frequencies of original observational codes by sex.

Supplementary Table 3.

Initial Logistic Regressions Predicting Emotion-Supportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(3) = 5.48$	.140	-
-2 Log Likelihood =	436.25			
Intercept	1.49	$\chi^2(1) = 100.39$***	.000	4.45
Child's Sex	-0.68	$\chi^2(1) = 1.17$	.280	0.51
Protective	-0.33	$\chi^2(1) = 0.00$	.966	0.72
Sex*Protective	0.33	$\chi^2(1) = 2.07$	.150	1.40
2. *State Anxiety*				
Model	-	$\chi^2(3) = 10.25$*	.017	-
-2 Log Likelihood =	438.57			
Intercept	4.47	$\chi^2(1) = 52.08$***	.000	87.28
Child's Sex	3.31	$\chi^2(1) = 0.74$	.389	27.36
State Anxiety	-1.03	$\chi^2(1) = 1.09$	.297	0.36
Sex*State	-0.83	$\chi^2(1) = 0.66$	.418	0.44
3. *Trait Anxiety*				
Model	-	$\chi^2(3) = 7.43$	.059	-
-2 Log Likelihood =	438.51			
Intercept	5.30	$\chi^2(1) = 63.35$***	.000	199.91
Child's Sex	-1.57	$\chi^2(1) = 0.22$	.640	0.21
Trait Anxiety	-1.22	$\chi^2(1) = 0.10$	.756	0.30
Sex*Trait	0.47	$\chi^2(1) = 0.29$	.589	1.60

Note. $^{\dagger}p < .05$, $*p < .017$, $**p < .003$, $***p < .0003$. Full models with interaction terms included are shown. Refer to Table 10 for the reduced models.

Supplementary Table 4.

Initial Logistic Regressions Predicting Emotion-Nonsupportive Responses

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Protective Parenting*				
Model	-	$\chi^2(3) = 9.10^{\dagger}$	.028	-
-2 Log Likelihood = 415.88				
Intercept	-0.51	$\chi^2(1) = 104.49^{***}$	.000	0.60
Child's Sex	-0.99	$\chi^2(1) = 2.40$	.121	0.37
Protective	-0.17	$\chi^2(1) = 3.88^{\dagger}$	.049	0.85
Sex*Protective	0.49	$\chi^2(1) = 4.47^{\dagger}$	.035	1.64
2. *State Anxiety*				
Model	-	$\chi^2(3) = 7.24$	.065	-
-2 Log Likelihood = 424.57				
Intercept	-4.47	$\chi^2(1) = 76.37^{***}$	.000	0.01
Child's Sex	2.46	$\chi^2(1) = 0.40$	.527	11.74
State Anxiety	1.03	$\chi^2(1) = 0.36$	.549	2.79
Sex*State	-0.75	$\chi^2(1) = 0.52$	.473	0.47
3. *Trait Anxiety*				
Model	-	$\chi^2(3) = 8.87^{\dagger}$	.031	-
-2 Log Likelihood = 420.03				
Intercept	-5.30	$\chi^2(1) = 84.73^{***}$	.000	0.01
Child's Sex	5.24	$\chi^2(1) = 2.39$	.123	188.89
Trait Anxiety	1.22	$\chi^2(1) = 2.33$	.127	3.39
Sex*Trait	1.46	$\chi^2(1) = 2.72$	.099	0.23

Note. $^{\dagger}p < .05$, $^{*}p < .017$, $^{**}p < .003$, $^{***}p < .0003$. Full models with interaction terms included are shown. Refer to Table 11 for the reduced models.

Supplementary Table 5.

Initial Logistic Regressions of Emotion-Supportive Responses by Condition

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Support: All Emotion*				
Model	-	$\chi^2(3) = 11.72$**	.008	-
-2 Log Likelihood = 437.10				
Intercept	0.66	$\chi^2(1) = 108.59$***	.000	1.94
Child's Sex	0.63	$\chi^2(1) = 4.60$**	.032	1.88
Condition	-0.08	$\chi^2(1) = 5.48$**	.019	0.93
Sex*Condition	-0.58	$\chi^2(1) = 3.41^{\dagger}$	.065	0.56
2. *Support: Positive Emotion*				
Model	-	$\chi^2(2) = 5.97^{\dagger}$	.051	-
-2 Log Likelihood = 308.19				
Intercept	0.82	$\chi^2(1) = 43.56$***	.000	2.27
Child's Sex	0.23	$\chi^2(1) = 1.09$	.296	1.25
Condition	-0.50	$\chi^2(1) = 5.53$*	.019	0.61
Sex*Condition	-0.50	$\chi^2(1) = 5.53$*	.019	0.61
3. *Support: Externalizing Emotion*				
Model	-	$\chi^2(2) = 11.80$**	.003	-
-2 Log Likelihood = 135.63				
Intercept	-0.50	$\chi^2(1) = 1.44$	.231	0.61
Child's Sex	1.01	$\chi^2(1) = 7.83$**	.005	2.75
Condition	0.41	$\chi^2(1) = 1.26$	.262	1.51
Sex*Condition	0.41	$\chi^2(1) = 1.26$	.262	1.51
4. *Support: Internalizing Emotion*				
Model	-	$\chi^2(2) = 8.91$*	.012	-
-2 Log Likelihood = 163.35				
Intercept	1.93	$\chi^2(1) = 95.73$***	.000	6.91
Child's Sex	-0.02	$\chi^2(1) = 0.00$	.952	0.98
Condition	-0.97	$\chi^2(1) = 8.42$**	.004	0.38
Sex*Condition	-0.97	$\chi^2(1) = 8.42$**	.004	0.38

Note. †p < .10, *p < .05, **p < .01, ***p < .001. Full models with interaction terms included are shown. Refer to Table 13 for the reduced models.

Supplementary Table 6.

Initial Logistic Regressions of Emotion-Nonsupportive Responses by Condition

Model	*B*	Likelihood Ratio $\chi^2(df)$	*p*-value	OR
1. *Nonsupport: All Emotion*				
Model	-	$\chi^2(3) = 10.04$*	.018	-
-2 Log Likelihood = 421.77				
Intercept	-0.66	$\chi^2(1) = 120.31$***	.000	0.52
Child's Sex	-0.63	$\chi^2(1) = 7.19$**	.007	0.53
Condition	0.08	$\chi^2(1) = 3.18^{\dagger}$	.075	1.08
Sex*Condition	0.41	$\chi^2(1) = 1.67$	.197	1.51
2. *Nonsupport: Positive Emotion*				
Model	-	$\chi^2(3) = 6.93^{\dagger}$	.074	-
-2 Log Likelihood = 308.19				
Intercept	-0.71	$\chi^2(1) = 41.71$***	.000	0.49
Child's Sex	-0.46	$\chi^2(1) = 1.26$	.262	0.63
Condition	0.26	$\chi^2(1) = 4.67$*	.021	1.29
Sex*Condition	0.43	$\chi^2(1) = 0.96$	.328	1.53
3. *Nonsupport: Externalizing Emotion*				
Model	-	$\chi^2(3) = 11.93$**	.008	-
-2 Log Likelihood = 135.63				
Intercept	0.55	$\chi^2(1) = 1.56$	.212	1.73
Child's Sex	-1.14	$\chi^2(1) = 7.69$**	.006	0.32
Condition	-0.55	$\chi^2(1) = 1.30$	.254	0.58
Sex*Condition	0.26	$\chi^2(1) = 0.13$	.720	1.30
4. *Nonsupport: Internalizing Emotion*				
Model	-	$\chi^2(3) = 9.32$*	.025	-
-2 Log Likelihood = 163.35				
Intercept	-1.79	$\chi^2(1) = 67.02$***	.000	0.17
Child's Sex	0.31	$\chi^2(1) = 0.05$	.816	0.73
Condition	0.74	$\chi^2(1) = 7.39$**	.007	2.10
Sex*Condition	0.46	$\chi^2(1) = 0.41$	.521	1.58

Note. $^{\dagger}p < .10$, $*p < .05$, $**p < .01$, $***p < .001$. Full models with interaction terms included are shown. Refer to Table 14 for the reduced models.

Appendix B. Family Demographics Food Allergy Impact Project Form

Family Demographics Food Allergy Impact Project

Interviewer _____ Participant Number _____

Mother's Occupation _____
(Full or Part-time)

Father's Occupation _____
(Full or Part-time)

Last Year of School completed by Mother_____

Last Year of School completed by Father_____

Names of Family Members	Age	Relationship to patient	Food allergies? specify

Does patient attend school outside the home? 1= yes 0=no # days per week _____
Homeschooled? 1= yes 0=no
Grade: Preschool Kindergarten Elementary Grade _____

Number of days of school missed in last _____ months (specify # months attending)

Any special education services? (specify) _____

Appendix C. Food Allergy Severity and Parent Worry Form

Parent Ratings of Food Allergy Severity Participant # _____

		Please answer the following for every food item checked "Yes"						
		What are your child's chances of being exposed to this food (in a way that would trigger an allergic reaction) in each of the settings below? (0 = no chance, 1 = low risk, 2 = moderate risk, 3 = high risk of exposure)					If your child were accidentally exposed to this food, what kind of reaction do you think he/she would have?	How worried are you about this particular food allergy?
✓ if yes	Is your child allergic to this food?	Your home	Homes of close friends & relatives	Homes of other friends	School or Day Care	Other places	1=Very Mild 7=Very Severe	1=Not Worried 7=Very Worried
	Peanuts	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Tree nuts	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Milk	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Soy	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Eggs	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Wheat	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Other grains	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Shellfish	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Scaled fish	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Fruit (list)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Vegetables (list)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7
	Other (list)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	1 2 3 4 5 6 7	1 2 3 4 5 6 7

Has your child ever had an anaphylactic reaction (serious breathing problem) caused by a food allergy? Yes No
If yes, how many times? _____ When was the last one? _____

Appendix D. State-Trait Anxiety Inventory

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

STAIP-AD Test Form Y
www.mindgarden.com

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

STAIP-AD Test Form Y
www.mindgarden.com

Appendix E. The Parenting Dimensions Inventory (Protectiveness Scale)

VI. The following statements represent matters of interest and concern to some parents. Not all parents feel the same way about them. Circle the number that most closely applies to you.

1. It is probably better for everyone involved if parents work out the arguments that their children have with their friends.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

2. If my child hurt himself at a friend's house I would not let him or her go back there to play.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

3. If my child is upset about something that happened at school, I would call his or her teacher and schedule a conference.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

4. If my child hits another child, I usually feel confident that there was a good reason for it and I do not correct him or her.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

5. I would be upset if my child's class went to the local zoo, and I didn't know about it beforehand.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

6. If a neighbor complained about my child, I would probably assume it had more to do with my neighbor than my child.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

7. I prefer that my child play at our house with his or her friends rather than playing at his/her friend's house.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

8. I prefer to drive my child to school rather than have him or her walk or use school transportation.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

9. I prefer that my child get involved in activities that I am familiar with rather than activities I know nothing about.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

10. If my child and I disagree about something I explain to him or her that I know what is best for him/her and I make decisions accordingly.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

11. I think it is important that my child does not get involved in activities or tasks where he or she may potentially fail.

1	2	3	4	5	6
Not at all descriptive of me	Slightly descriptive of me	Somewhat descriptive of me	Fairly descriptive of me	Quite descriptive of me	Highly descriptive of me

Appendix F. Emotion Coding System

Emotion Coding System

Adapted from Cole, Wiggins, Radzioch, and Pearl (2009)

This coding system is designed to assess emotion in a more global manner than second-by-second microanalytic techniques do. We use it to study large blocks of time for which second-by-second coding is impractical. The system is designed to distinguish the valence of a child's emotion (e.g., positive or negative) and into which of four basic emotion categories the emotion falls. The coder judges which basic emotions the child appears to be communicating during the epoch and then rates the intensity of each of the four emotions, ranging from not at all to strongly shown, during the epoch.

Emotion Coding

The purpose of this coding system is to classify the emotion displays of children during lab-based procedures. Emotions are classified using time-based units, called *epochs*. An epoch is a 15-second interval. During an epoch, the coder scans the entire interval, determines which of 4 basic emotions were present (or absent). The system is limited to 4 basic emotion families: happiness, anger, anxiety, and sadness. There are separate cues provided for each emotion code. They are based on consensus across different research projects attempting to provide methods for reliably classifying discrete emotions (Ekman, Izard, Scherer). These discrete emotion families are based on research that indicates certain facial, vocalic, and to a lesser degree, gestural and postural, cues are consistently associated with particular emotion families.

Emotion Codes

*Differentiating features are italicized.

Happy (1) – joyful, excited, enthused, delighted, gleeful, pleasantly surprised

Vocal Cues: Voice is *light* and lilting, pitch often becomes higher and/or louder than previous vocalizations, includes laughing, *giggling*, humming in a *singsong* manner. (lilting-speaking rhythmically with fluctuating pitch; rhythmical swing or cadence)

Facial Cues: Smiling, slightly or broadly, in which corners of mouth turn up, cheek area rounds up as muscle is contracted; smile may or may not be accompanied by *crinkling around eyes*, which often appears as brightness in eyes; forehead is smooth, brows may raise as in happy surprise.

Posture/Gesture: There is usually a little tension in the body (i.e., body is not slumped) but child's shoulders and chest appear relaxed; children may jump up, raise their arms in glee, *clap* their hands with delight.

Sad (2) –disappointed, regretful, specific kind of unhappy, hopeless, dejected

Vocal Cues: *Voice is lowered* from previous volume without intention to whisper or drops off at end of utterance; if child is whining, these sad vocal cues must still be present for some part of the whining to give any sadness.

Facial Cues: Frowning; lip corners may begin to pull down, bottom lip may appear loose as in a pout (note: pouts may also contain cues of anger), eyes may droop, brow may form an oblique shape.

Posture/Gesture: *Child's head may drop down* and to the side, shoulders and/or body may *slump* or be slack, eye rubbing may be effort to catch or hide tears; crying in presence of other cues.

Angry/Frustrated (3) – frustrated, hostile, annoyed, irritated, mad

Vocal Cues: Voice becomes harsh, conveys protest, irritation, frustration, *hostility*, pitch is often louder and deeper, utterances have a plosive quality (as in the sound [p] in *pit*). Can include a contemptuous tone of voice. If whining HAS protest quality, code ANG.

Facial Cues: Brow may be furrowed (but there must be additional cues to code as anger*), eyes can be narrowed* as in a "hard stare", *jaw clenched* or set, mouth squared off if open, *lips pressed or tightened* if mouth closed.

Posture/Gesture: Arms akimbo (fists placed on each hip), finger wagging or jabbing. (Aggressive behaviors (e.g., punching) are **NOT** codable without additional anger cues.)

Anxious/Worried (4) – nervous, tense, jittery, wary

Vocal Cues: Voice is strained and conveys stress, may sound *shaky*, tight; tension in the vocal chords makes them constrict in a way that disrupts smoothness of speech; may sound fearful, if whining has **NO** protesting quality, code as ANX or SAD.

Facial Cues: Brow may be furrowed, deepened; eyelids may be raised, *eyes appear wider*; lips may retracted (think of saying the word "eek" if you see a snake or insect and that's how the mouth retracts); there may be lip-biting, darting glances.

Posture/Gesture: Hand or foot may move in repeated, *jittery*, *fidgeting* fashion; upper body (neck, head, shoulders) may appear stiff, *shoulders raised* in unrelaxed manner. If child has a nervous habit of shaking hand or foot and continues this throughout the procedure, it is **NOT** codable as ANX. Code only changes in behavior.

Neutral (0)

No signs of vocal, facial, or postural cues of any emotion. Voice sounds "matter of fact."

Non-codable (999)
Use this code you are unable to rate the child's emotions because you cannot see child's face or hear tone of voice during the 15 second epoch.

Emotion Intensity Coding

Intensity of each emotion is coded on a 0 – 3 scale. Level of intensity is determined by the number and quality of emotion cues that are present in an episode.

Intensity Levels (note that there is a range of intensity in levels 1 – 3)

0-*Slight intensity* ranges from slightest perception of emotion cue to extended but mild level of intensity. Cues may be very brief, fleeting, or slight. If extended in duration, the cues must be faint or minimal. There may be only one cue present but if more than one present, must be slight, faint, minimal.

2- *Clear but moderate intensity* ranges from a brief but clear expression to an enduring but moderate level of intensity (in other words, expression could definitely be fuller but is not). More than one cue is likely to be present.

3- *Strong intensity* ranges from brief but full expression to full and more enduring expression of emotion. Typically there are multiple cues; body/gestures are likely but not necessary. Cues should be clear, unambiguous.

Decision Rules:

- WHEN EMOTIONS LAST FOR MULTIPLE INTERVALS
  - IF A PAUSE occurs in between behaviors, count as separate incidents (each with their own response/non-response.
  - IF NO PAUSE, count as a single incident and code mom's response if it occurs within 10-seconds of *offset*.
- WHEN THE CHILD IS BORED AND/OR FRUSTRATED
  - It is possible for boredom to cause frustration, but we only want to code the latter.
  - IF the child appears bored, but does not exhibit any cues of frustration in the manual, do *not* code.
- SADNESS VS. ANXIETY
  - The biggest difference between SAD & ANX is arousal. Sadness is associated with low arousal while anxiety is associated with high arousal and agitation.
  - IF the child exhibits cues from *both* SAD & ANX, but you **do not see signs of agitation** (e.g., muscle tension, fidgeting, pacing around), code **only** as **SAD**.
  - IF the child exhibits cues from *both* SAD & ANX, but you ***do* see** signs of agitation, code as **SAD** *and* **ANX**.

Emotion Examples:
(LoBue & Thrasher, 2015; Stock Photos)

Happy

Sad

Angry/Frustrated

Anxious/Worried

Neutral

Appendix G. Emotion Socialization Coding System

The purpose of this coding system is to classify caregiver (referred to as "parent" throughout) behaviors immediately following their children's spontaneous emotion expression episodes during a lab-based frustrating task (the difficult age-inappropriate puzzle task).

The system categorizes caregivers' behaviors during and following each episode of child emotion expression as one of 6 types of responses (Ignore, Reward, Dismiss, Distract, Punish, Magnify). The categories were derived from theory and research on the socialization of emotion expression (Chaplin et al., 2005; Denham; Klimes-Dougan et al., 2007) and measures of parents' self-reported reactions to their children's emotions (e.g., the CCNES: Fabes et al., 1990; the EAC: Magai, 1996).

During the 10 seconds following the child emotion start time, the caregivers' socialization behavior will be classified, based on their words, behaviors and/or emotional expressions (using vocal/facial/postural cues).

Codes

Ignore/No Response (5)
The parent is able to see the child's affect, but does not evidence any behavior, verbalization, or affect during the 10 seconds after the child's emotion expression episode begins. In other words:

a. *No verbalization:* The parent either does not make any verbalizations in the 10 seconds OR the parent's verbalizations are clearly irrelevant (please check these with the coding team if you are uncertain, in most cases, only code if the parent does nothing during the 10 seconds)

b. *No Behavior:* The parent does perform any behavior that may be coded (the parent may do other behaviors, like continuing to work on questionnaires, fidgeting, etc.) during or following the emotion.

c. *No Emotion:* The parent either does not express any emotion following the child's episode OR the parent's emotion expression represents a decrease in intensity from the time prior to the child's episode.

Reward (6)
The parent is promoting/encouraging/reinforcing the maintenance or the increase of the child's emotion expression. Generally, the parent appears to accept and/or encourage the child's expression of emotion.

Examples include:

a.*Affirming* the emotion: asking the child how they feel, reflecting on the emotion- "you seem sad" without any negative judgment.

b.*Comforting* the child: "It's okay," giving the child a hug.

c.*Helping* the child: help them physically [parent picks up a toy that fell or helps child to figure out how to pick it up], helps them to problem-solve.

d.*Positive Sound:* If parent makes a sound (e.g., "oohh!") that is meaningful (i.e., no grunts, sniffles, sighs, etc.) or expresses an emotion that matches the child's emotion in a supportive (not overwhelming [Magnify]) way. Code as Reward if the sound appears to be affirming the emotion, or comforting, helping the child in a positive or neutral way.

e.*Agreeing* with the child, complimenting the child, or yielding to the child's wishes (even if it means letting them do something incorrect). Paraphrasing the child's speech.

Non-examples include:

a.Criticizing the emotion: discussing the emotion with a harsh tone of voice, criticizing the emotion, or using negative connotation, (e.g., "why are you whining?") Code as Dismiss [7] or Punish [9]

b.*Frustrated Helping*: If the mother helps or does the task for the child while expressing frustration or annoyance, code as Magnify [10].

c.If the parent makes a sound that indicates distress or annoyance (e.g., "ugh"), code as Magnify [10].

d.*Dismissive Helping:* If the mother's solution to the problem discourages emotion (e.g., "Calm down and try again"), code as Dismiss [7].

e.*Dismissive Agreeing*: If the mother's agreement with an emotion or wish seems insincere or hurried (e.g., "uh huh" inflected downwards, or "do whatever you want, I don't care") code as Dismiss [7].

Dismiss (7)
The parent is dismissive or minimizing of the child's emotion expression. They may be trying to end interaction with the child or prevent further expression.

Examples include:

a. *Judging the emotion*: using emotion words with negative connotation (e.g., "whining," "fussing," "too much noise,")

b. *Invalidating the emotion*: "It's not *that* hard," or "there's no reason to cry."

c. *Giving Directions* to stop expressing: Telling the child to change his/her attitude; saying, "quit fussing," "stop your whining," or "cheer up already" or telling the child to keep quiet.

Non-Examples Include:

a. *Judging the child*: Calling the child names or criticizing the child directly (e.g., "you're too sensitive," "you're such a crybaby"), code as Punish [9].

b. *Punishing*: If directions to stop expressing are followed by a form of punishment (taking something away, disciplinary action), code Punish [9].

Distract (8)
The parent distracts the child from a distressing problem and its affective impact. This is done with a positive disposition. The parent appears to be interested in helping the child cope with the emotion rather than in their own experience of the situation.

Examples include:

a. *New topic*: Changing the topic of conversation to something positive or obviously pleasurable to the child (e.g., "remember when we went to the amusement park?")

b. *New activity*: Drawing the child's attention away from the task to focus on something more enjoyable (e.g., pointing out something interesting in the room or offering the child a toy)

Non-examples include:

a. *Changing the topic to something else distressing*: If the new topic is also obviously negative (e.g., reminding the child of another time that they failed), code as Punish [9].

b. *Changing the activity to something not enjoyable*: If the new activity is not enjoyable or not distracting (e.g., giving the child a time-out), code as Punish [9].

Punish (9)
Parent appears to be discouraging with the child's emotion by setting limits on or punishing the child's behavior. (note: usually this code is focused on the child's behavior [or misbehavior] and not so much on the emotion itself, although the child may be emotional at the time).

Examples include:

a. *Disciplining* the child: Setting a limit, taking away a toy or puzzle piece, instituting a time-out, threatening to take something away, etc.

b. *Scolding* the child (if the parent appears to be distressed her/himself, can also code as Magnify [10])

c. *Disagreeing* with the child's wishes: "You're doing it wrong" (must be immediately after the child expresses an emotion – not before / the cause).

d. *Mocking* the child: making fun of him/her, calling the child a "crybaby" or any negative name.

e. If parent makes a sound (e.g., "ugh!") that is meaningful, code as Punish only if the sound appears to be discouraging or critical of the child's behavior or emotion.

f. If the punishment seems appropriate for the child's behavior (e.g., child is throwing a tantrum), *still code as Punish* [P]. Code only the behavior, not the antecedent.

Non-Examples:

a. If any of these behaviors appear to be the *cause* of an emotion (i.e., they preceded the emotion), do not code! Code only responses.

b. *Distressed Punishing*: If the parent appears to be personally distressed (i.e., upset or angry) while punishing, code BOTH Punish (9) and Magnify (10).

Magnify (10)
The parent her/himself becomes emotionally aroused or upset in response to a child's emotion.

Examples include:

a. *Matching emotion*: Matching the child's *negative* emotion with the same or greater intensity and/or duration (e.g., if the child is angry, the mother becomes angry too).

b. *Showing distress*: Parent becomes obviously distressed, appears annoyed, uncomfortable, worried, or frustrated.

Non-Examples:

a. If the mother responds to the child's happiness with their own happiness, code as Reward [6].

b. If the mother appears to be feigning the emotion in a way that belittles it, code as Dismiss [7] or Punish [9].

7. CAN'T RATE (999)

This category should be reserved ONLY for cases in which you think that the parent may have responded in some way, but you cannot see/hear them clearly enough OR if you believe that the parent could not see the child during the interval.

Parent Responses Coding Procedures:

1. View the entire interaction one time through in real time to familiarize yourself with the parent and her/his style of interaction.

2. When you are ready to begin coding, find the child emotion coding sheet for your subject. On the top of the coding sheet write down your initials and the date of your coding session.

3. The first step of coding is to look for the first child emotion episode (as marked on your coding sheets). Note that you may NOT change any child expression codes- if they are unclear, please bring them up in the next coding meeting. Then, observe the parents' affect/behaviors/verbalizations during the 10 seconds after the start time of the child emotion. Next, classify the parents' behavior as one of the codes and enter the response code number (#6-10, or 999) into the adjacent space.

4. In cases where classifying the parent's behavior is not obvious, be sure to use the coding scheme to determine which cues are present. If you encounter a situation that the coding scheme does not address, consult decision rules (below). If you are still uncertain, write down the time and the problem in your personal lab notebook so you can discuss it at the next coding team meeting.

5. If you are coding the 10 seconds following the child emotion and you notice that the emotion clearly goes on past that 10 seconds, code any parent behavior observed during the 10-second epoch and issue another code in the next if interval if indicated.

Protocols:

1. If response meets criteria for more than one code, you may double-code.

2. Code the behavior, not the intention of the behavior. Even if the parent is not speaking specifically about the child's emotion, still code what the parent *does* (e.g., does she disagree with the child, does she punish the child).

3. Ignore what parents did before the emotion start time. Code whatever they did in your period of time as a new behavior.

Decision Rules:

- WHEN EMOTIONS LAST FOR MULTIPLE INTERVALS
  - IF A PAUSE occurs in between behaviors, count as separate incidents (each with their own response/non-response.
  - IF NO PAUSE, count as a single incident and code mom's response if it occurs within 10-seconds of *offset*.

- WHEN CAREGIVER CHANGES RESPONSE WITHIN THE 10-SECOND INTERVAL
  - CODE BOTH the initial response (no matter how brief) and the other response(s)

- DISMISS VS. DISTRACT
  - The biggest difference between Dismiss & Distract is the child's attention. When a caregiver *dismisses* a child's behavior, they are not redirecting the child's attention away from the emotion and/or task. When a caregiver *distracts* a child, they are deliberately redirecting the child's attention to something more pleasurable and/or calming.
  - DISMISSING emotion is similar to punishment in that it (indirectly) brings about a decrease in future expressivity by teaching the child that their emotions are not important or desirable.
  - DISTRACTION has a more positive connotation and it is *not* supposed to decrease future expressivity – rather, it teaches coping skills for tolerating strong emotion.
  - IF the caregiver's response *does NOT* redirect the child's attention, code as Dismiss (7)
  - IF the caregiver's response *does* redirect the child's attention:
    - To something positive (e.g., a toy or happy memory), code as Distract (8).
    - To something negative (e.g., loss of a toy or unhappy memory), code as Punish (9).

Appendix H. Example Coding Sheet

Start Time: _____ End Time: _____ **Emotion Socialization Coding** ID: _____ Coder 1: _____ Coder 2: _____

Code	**0:00-0:15**	**0:15-0:30**	**0:30-0:45**	**0:45-1:00**	**1:00-1:15**	**1:15-1:30**	**1:30-1:45**	**1:45-2:00**	**2:00-2:15**	**2:15-2:30**	**2:30-2:45**	**2:25-3:00**
(Clock Start Time)	9:32:45	9:33:00	9:33:15	9:33:30	9:33:45	9:34:00	9:34:15	9:34:30	9:34:45	9:35:00	9:35:15	9:35:30
1. Happy												
2. Sad												
3. Angry/Frustrated												
4. Anxious/Worried												
Intensity												
5. No Response												
6. Reward												
7. Dismiss												
8. Distract												
9. Punish												
10. Magnify												
Codes Issued (#s)												
(In the order that they occurred)												
Coder Comments:												

Intensity Codes:
0 = None, 1 = Slight, 2 = Clear, 3 = Strong

Not Codable = 999

Example Coding Sheet (Back)

Code	**3:00-3:15**	**3:30-3:45**	**3:45-4:00**	**4:00-4:15**	**4:15-4:30**	**4:30-4:45**	**4:45-5:00**	**5:00-5:15**	**5:15-5:30**	**5:30-5:45**	**5:45-6:00**	**Total**
(Clock Start Time)	9:35:45	9:36:00	9:36:15	9:36:30	9:36:45	9:37:00	9:37:15	9:37:30	9:37:45	9:38:00	9:38:15	
1. Happy												
2. Sad												
3. Angry/Frustrated												
4. Anxious/Worried												
Intensity												
5. No Response												
6. Reward												
7. Dismiss												
8. Distract												
9. Punish												
10. Magnify												
Codes Issued (#)												
(In the order that they occurred)												
Coder Comments:												

Intensity Codes:
0 = None, 1 = Slight, 2 = Clear, 3 = Strong

Not Codable = 999

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