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THE FAMILY AFFECTIVE ATTITUDE RATING SCALE IN CHILDREN WITH ASTHMA: THE ASSOCIATION BETWEEN RELATIONAL SCHEMAS AND EMOTIONAL SECURITY

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University

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Acknowledgments

Table of Contents

List of Tables

List of Figures

vi

Abstract

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By: Jessica L. Greenlee, BA

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The Five Minute Speech sample is a cost effective, efficient means of data collection in developmental research, but recent criticism of traditional coding methods associated with the methodology has spurred the creation of more developmentally appropriate coding systems. The purpose of this study is to examine the reliability and validity of a new coding system, The Family Affective Attitudes Rating Scale (FAARS), for use in children with chronic illness. Results did not support the use of this coding system, at least in its current form, in a pediatric asthma population. Discussion focuses on whether the FAARS may be of use when examined on an item level and directions for future research - such as profile analyses and edits to the coding system - that may better capture the experiences of parenting a child with chronic illness.

The Family Affective Attitude Rating Scale in Children with Asthma: The Association Between Relational Schemas and Emotional Security

Introduction

Understanding parents' implicit attitudes, or schemas, about their children and their relationships is important in elucidating caregivers' influences on child development. Schemas are defined as stable cognitive generalizations that operate automatically to help organize, guide, and simplify the processing of social information (Bugental & Johnston, 2000; Dunsmore & Halberstadt, 1997). Schemas help the brain determine the importance and meaning of social and environmental cues and provide a consistent basis from which to form expectations and consequences. They include assumptions, attitudes, and beliefs about the self, other people, and relationships (Simons, Simons, Lei, & Landor, 2012). Individuals use schemas to predict events and evaluate the consequences of those predictions (McGillicuddy-DeLisi, 1982). Of particular importance when discussing parent-child relationships is the notion of *relational* schemas. Developmental psychologists have traditionally conceptualized this using Bowlby's theory of working models, or cognitive representations that work automatically to guide how individuals act in repose to and within relationships (Bowlby, 1982; Bugental & Johnson, 2000). Cognitive psychologists have added to this theory by proposing that individuals develop schemas of close relationships that are based on past experiences and are influenced by affective states that organize and guide behavior (Baldwin, 1992; Bugental & Johnson, 2000). Parents have schemas, or implicit attitudes and beliefs, about their children that guide their interpretation of, and reaction to, children's behaviors (Fonagy & Target, 1997; McGillicuddy-DeLisi, 1982) and predict both parenting behaviors and child outcomes (Snyder, Cramer, Frank, & Patterson, 2005).

Interactional models of parent-child relationships highlight that schemas develop over time and stress that relationships are represented by past experiences and anticipated in future dyadic interactions (Lollis & Kuczynski, 1997). These schemas are based in past experiences with both the child and in other relationships and influence how each partner behaves, thinks, and feels about the relationship and the other person (Bowlby, 1982). These beliefs about one's self and one's child play a role in a parents' ability to be effective in the parent-child relationship. Research suggests that in situations where children are at increased risk for negative mental and physical health outcomes, whether from early exposure to endemic stressors or biological predispositions such as chronic illness, parents' beliefs about their children can improve or worsen these outcomes (Murphey, 1992).

Asthma is one of the most common chronic illnesses effecting children ages 0-17 in the United States (Akinbami et al., 2012). It is a disorder characterized by airway obstruction, inflammation, and bronchial hyper responsiveness (National Heart, Lung, and Blood Institute, 2007). There is substantial evidence that family and parenting factors play a role in asthma outcomes (Kaugars, Klinnert, & Bender, 2004) and some suggest that the parent-child relationship is an important mechanism in understanding how family factors influence disease-related and psychological processes in asthmatic children (Wood et al., 2008). Thus, understanding parents' schemas in families with a child with asthma could help shed light on how the parent-child relationship influences child outcomes and is the underlying goal of this study.

Theoretically, the association between parents' beliefs about their children, parenting behaviors, and child outcomes has been clearly defined in the literature (Bugental, & Johnston, 2000); parents' implicit beliefs are presumed to influence their explicit parenting behaviors,

which in turn influence child outcomes. For example, research has linked parents' perceptions of child temperament, behavior problems, and impulsivity to parenting behaviors (Dadds, 1987; Nix et al., 1999; Russell, 1997). However, much of the research in this area is correlational and reliant on self-report data. In a study examining how parents' perceptions of their child's shyness influences parents' behavior, the relationship between early shyness and later parenting only held when using parents' self-report account of their child but no association was found during observational assessment of the child or of parent-child interactions (Rubin, Nelson, Hastings, & Asendorpf, 1999). This study highlights the methodological difficulty researchers have had in describing the link between parental schemas and behaviors. Self-report assessments of parental attitudes may reflect more explicit, conscious, and deliberate cognitive processes that are prone to bias than underlying, implicit schemas about children and parent-child relationships (Sturge-Apple, Rogge, Skibo, Peltz, & Suor, 2015). Whether talking about relational schemas, cognitions, or internal working models, these constructs all involve "stable knowledge structures that operate automatically and with little awareness" (Bugental, & Johnston, 2000; p. 317) and self-report assessment may not be the best method to tap into these constructs. Given this potential difficulty in assessing schemas using self-report measures, developmental researchers have attempted to tap into these schemas using observational techniques that are less subject to participant bias. Examining one of these methodologies – the Five Minute Speech Sample (FMSS; Magaña et al., 1986) – and associated coding systems that may better tap into parenting schemas is a central goal of this study.

The FMSS (Magaña et al., 1986) was originally developed as an easy, cost-effective assessment method that allows researchers to gain insight into the emotional climate of the parent-child relationship. By asking caregivers to speak, uninterrupted, for five minutes about

their children and their relationships, the expressed emotion of caregivers is articulated via statements of criticism and emotional over-involvement (EOI). This procedure is widely used in developmental research and is generally considered an acceptable research tool (Sher-Censor, 2015). Its use in families with a child who has asthma has been of particular interest to researchers, given the traditionally held belief that parents' overprotective, or "smothering", behaviors and feelings toward their children play an important role in children's asthma morbidity (Robinson, 1972).

Although the FMSS is certainly a useful methodology in a practical sense, it is not particularly meaningful unless used alongside a coding system that not only accurately captures the constructs of interest, but is also developmentally appropriate. Recent evidence calls into question whether the coding system typically used with the FMSS meets these criteria. The original coding system, developed by Magaňa et al. (1986), is intended for use with parents discussing their *adult* children, and therefore may not be valid for use with parents discussing their young children in whom EOI could reflect parents' normative emotional involvement. This could be of particular consequence when talking about families of children with chronic illness that may be particularly reliant on caregivers for both health and emotional care.

In response to this criticism, Bullock & Dishion (2004) developed a new coding system for the FMSS, The Family Affective Attitude Rating Scales (FAARS), that hinges on the idea that the FMSS provides insight into parents' schemas about their children and their relationships, which subsequently guides parents' behaviors and parent-child interactions. For example, negative schemas about a child could lead a parent to interpret neutral or positive behaviors as negative, causing the parent to react in a harsh manner. In the case of a child with asthma, a negative relational schema could influence the parents' interpretation of illness-related behaviors

4

and lead to poor asthma management. The utility of the FAARS is in its ability to tap into the perceptions of the parent rather than a developmentally-dependent construct such as emotional over-involvement and as such, could theoretically be used across a wide range of ages and contexts. Generally, the psychometric properties of the FAARS have been sound in a number of populations ranging from toddlers to school-aged children (see below and Sher-Censor, 2015); however, no study has yet to examine the use of the FAARS in a chronically ill population.

Given the utility of the Five Minute Speech Sample as a tool for researchers and the need for a developmentally appropriate coding system that corresponds with the straightforward, cost-effective, and relatively limited burden on families this method of data collection poses, the purpose of this project is two-fold. First, we examined the FAARS with FMSS recordings from a population of parents of preschool and school-aged children with asthma. Second, we hypothesized a process model that has been consistently supported theoretically, but not empirically: parents' mental health and negative relational schemas about their children will affect their parenting behaviors, which in turn will result in children feeling more insecure in their family relationships.

Background

This literature review begins with a review of the Expressed Emotion Model, including a description of the Five Minute Speech Sample in developmental research, and the schema-guided model of the Family Affective Attitude Rating Scale. Following these sections, parental schemas are discussed in relation to attachment and cognitive theories. Next, research regarding the link between parental schemas and parenting behaviors is detailed, followed by a discussion of the role of parental mental health in this relationship and the consequences for child outcomes,

namely emotional security in asthmatic children. Finally, the role of child age, gender and parental education are discussed as possible covariates in the presented path model.

The Expressed Emotion Model as a Reflection of Caregiver Schemas

Assessment using verbal behavior was first introduced by Louis Gottschalk and colleagues (1976) as a way to provide, "objective measures of psychological states" (p. 2). Verbal assessments were initially coded for constructs like anxiety, hostility, and hope and were found to correspond to psychiatrists' ratings of psychopathology (Gottschalk & Gleser, 1969) and to predict treatment efficacy (Gottschalk, 1974). Around the same time, Brown & Rutter (1966) introduced the Expressed Emotion (EE) Model to predict relapse rates among adults with schizophrenia. Expressed Emotion (EE) is characterized by adverse family environments, including the quality of interactions and nature of the relationship between the caregiver and care recipient assessed through hour-long, semi-structured interviews with the caregiver (Brown & Rutter, 1966). The EE Model is based on researchers' observations that individuals with schizophrenia who return home to live with caregivers whom are highly emotionally involved and/or critical are more likely to relapse than those living in more stable family environments.

Brown and Rutter suggest that one can assess these family environments based on caregivers' statements about their relatives and as such, researchers can measure the construct of expressed emotion through semi-structured interviews with the caregiver. Analysis of the caregivers' speech and vocal tone throughout the interview results in a series of three subscales designed to tap into the overarching latent construct of expressed emotion: criticism (dislike of the target's behavior), hostility (general dislike of the target), and emotional over-involvement (overprotective attitudes and/or emotional distress during interview). Research in adults has generally found high expressed emotion to be associated with negative behaviors of both the

6

caregiver and the target adult child, to predict the course of psychiatric relapse, and to be modifiable through interventions that focus on problem solving and communication skills in caregivers (see Sher-Censor, 2015 for a review). These results have been interpreted to mean that caregivers who are high in expressed emotion struggle to accommodate the needs of their adult schizophrenic children and instead respond in resentful, and/or overprotective ways that are harmful. More broadly, caregivers' high expressed emotion leads to more negative caregiving/parenting behaviors.

Traditionally, expressed emotion has been difficult to assess. Collecting and coding hour long interviews takes significant time and resources not often available in research or clinical settings. In response, Magaňa and colleagues (1986) developed the Five Minute Speech Sample (FMSS), and modified Brown & Rutter's original expressed emotion coding system to accommodate a five-minute block of speech instead of an hour-long interview. This updated assessment technique and coding system focuses only on criticism (dislike or disapproval of the child) and emotional over-involvement (EOI; excessive worry or concern, exaggerated praise, self-sacrificing behaviors), removing warmth and hostility and using the number of positive comments as a form of idealization that typifies EOI. The FMSS is significantly more efficient in terms of time to complete the assessment, less burden on participants, less time to train coders, and less time to code. Initial validity data found the FMSS EE score to correspond to the interview EE scores and to predict psychiatric relapse (Magaňa et al., 1986).

The applicability of EE in children. Assessment of EE theoretically taps into the contribution of family processes to adult symptomatology, and some suggest that EE should also be associated with child and adolescent adjustment. Expressions of parents' attitudes that emerge during EE assessments presumably guide subsequent parenting behaviors, which play a major

7

role in children's development (Brown, Birley, & Wing, 1972; Hooley, 2007). Researchers argue that parents' expressed emotion while speaking about their children reflects daily dyadic interactions that predict child adaptation. The use of the FMSS-EE coding system in developmental research spans about 30 years (Magaňa-Amato, 1993) and has been used in children and adolescents with chronic asthma (Wamboldt, O'Connor, Wamboldt, Gavin & Klinnert, 2000), ADHD (e.g. Cartwright et al., 2011; Daley, Sonuga-Barke, & Thompson, 2003), anxiety disorders (Gar & Hudson, 2008), conduct disorder (Vostanis, Nicholls, & Harrington, 1994), depression (e.g. Asarnow, Tompson, Woo & Cantwell, 2001; Burkhouse, Urhlass, Stone, Knopik, & Gibb, 2012), behavior problems (e.g. Calam & Peters, 2006; Khafi, Yates, & Sher-Censor, 2015), and children with special needs (Kubicek, Riley, Coleman, Miller, & Linder, 2013). Expressed emotion has been associated with a host of outcomes across child development including ADHD symptoms, behavior problems, negative affect and coercive parenting in school-age children (Marshall, Longwell, Goldstein, & Swanson, 1990; Peris & Hinshaw, 2003), and high levels of depression, poor social functioning, and self-injurious thoughts and behaviors in adolescents (McCleary & Sanford, 2002; Wedig & Nock, 2007).

Given the important role of family context in childhood development (Bronfenbrenner, 1986), one could assume that EE should be particularly salient for young children. However, recent criticism of the applicability of the expressed emotion construct (and thus, use of the EE coding system as a measure of that construct) for use in children has called this assumption into question. Concern centers on whether or not the criticism and EOI constructs have the same meaning in reference to young children as they do in adults with serious psychopathology. The relationship between parental criticism and child outcomes is well documented in a number of populations (Sher-Censor, 2015). However, the evidence for an association between EOI and

child outcomes such as behavior problems and internalizing symptoms is mixed (Khafi et al., 2015). The mixed findings have led to a debate amongst developmental researchers as to how to conceptualize EOI in regards to parenting young children. In the original conception of expressed emotion, positive remarks are considered "excessive" and have negative consequences that result in a high EOI score. For young children, such praise could be more normative and less harmful. For example, in one study of children 7-17 years old, the number of positive remarks made during the FMSS was related to *fewer* externalizing problems (McCarty & Weisz, 2002).

A number of researchers have been unable to replicate the adult findings that EOI is related to negative parenting behaviors. For example, in a study of infants and toddlers, parents' EOI scores were not associated with maternal sensitivity, structuring, intrusiveness, hostility toward children, or children's responsiveness during parent-child interactions (Kubicek et al., 2013). Child externalizing problems have been linked to self-sacrifice/ overprotection and parents' attitudes regarding children but not exaggerated praise, the scale most often used in studies of expressed emotion (Khafi et al., 2015). In another study of school-aged children, emotional over-involvement was not associated with observed intrusive or controlling behaviors from parents, levels of fostering independence, or children's behaviors toward parents (McCarty, Lau, Valeri, & Weisz, 2004). This might suggest that the link between parents' expressed emotion (particularly EOI) and parenting behaviors may not be as strong as originally theorized. Emotional over-involvement as coded through parental speech samples in a population of pre-adolescents was not associated with indices of observed EOI like controlling parental behavior, positive comments from parents combined with anxious affect, or parent-child interactions (Cruise, Sheeber, & Thompson, 2011).

Furthermore, evidence is mixed in regards to EOI and child adaptation. Some studies have been able to differentiate children with and without ADHD, behavior problems, and anxiety (Peris & Hinshaw, 2003; Raishevich, Kennedy, & Rapee, 2010; Stubbe, Zahner, Goldstein, & Leckman, 1993) based on parents' EOI scores, whereas others have been unable to replicate such findings (e.g. Asarnow et al., 2001; Przeworski et al., 2012). Some studies have even found high EOI to be related to better child outcomes such as *fewer* ADHD symptoms and behavioral problems (Psychogiou, Daley, Thompson, & Sonuga-Barke, 2007), and *better* emotion regulation skills (Han & Shaffer, 2014). The inability of child researchers to replicate associations between EOI, parenting, and child adaptation calls into question the utility of the EE coding system for the FMSS as a whole and whether constructs such as emotional over-involvement are applicable in child populations.

Expressed Emotion and childhood asthma. One area in which this question is particularly pertinent is in childhood asthma. Pediatric asthma, the most common chronic disease in children, is an inflammatory disorder of the airways characterized by airway restrictions and inflammation that can cause episodes of wheezing, breathlessness, chest tightness, and coughing (Centers for Disease Control and prevention, 2013). Asthma can be a stressor that impacts families. For example, asthma can contribute to financial stress, family conflict, disrupted family routines, and decreased caregiver quality of life (Everhart, Fiese, & Smyth, 2008; Wood, Miller, & Lehman, 2015). These disruptions can in turn affect the child's asthma by inducing stress-related symptoms in the child and impairing the family's ability to manage the disease (Wood et al., 2015).

Parents' influences on asthma symptomatology have traditionally been viewed from a "helicopter parent" perspective in which the suffocating parent who is constantly over involved

with the child causes the child to suffocate from their asthma (Robinson, 1972). While some level of concern is reasonable, it has been hypothesized that concern may change into over-involvement and overprotectiveness as exhibited by overly controlling and intrusive parenting that will exacerbate asthma symptoms (Lee, Murry, Brody, & Parker, 2002). High parental criticism has also been linked to higher hospitalization raters and lower response to treatment (Wamboldt, Gavin, Roesler, & Brugman, 1995).

If this is true, a coding system aimed at identifying criticism and emotional over-involvement of parents in children with asthma could be a useful tool in managing asthma outcomes. However, in a study of children with asthma, Wamboldt and colleagues (2000) could not find an association between parental EOI as measured by the FMSS-EE coding system and any of their child or family measures. They found parents could be rated high in EOI for two distinct reasons: emotional displays of self-sacrificing/over-protectiveness or more than five positive remarks (excessive praise). They concluded that they were likely tapping into two different things: one indicator of more negative interaction patterns and one indicator of more positive interaction patterns. For example, the number of positive remarks was associated with better child and family functioning across observational and self-reported data such that what was labeled "excessive praise" was no longer viewed as a form of emotional *over-involvement* but as a helpful mechanism for children. At the very least, excessive praise was not related to behavior problems or psychopathology in children. Thus, it is possible that the criticism and EOI subscales may not be indicators of a single construct, expressed emotion. The two scales were not correlated and variables that were correlated with one subscale were not correlated with the other. Furthermore, given the correlation between positive child and family functioning and high EOI, the EE coding system lacks a dimension for positive expressed emotion or warmth that may

11

better capture parts of the parent-child relationship. Evidence in other child populations finds EOI to lack internal consistency (Peris & Baker, 2000) and fail to predict both externalizing and internalizing behaviors (McCarty & Weisz, 2002). As such, researchers have recently begun to examine alternative coding systems for use with the FMSS.

The Family Affective Attitudes Rating Scale

While the FMSS has proven to be an easy, efficient assessment tool for developmental researchers, the applicability of measuring expressed emotion in parents of children and adolescents has recently been called into question, creating need for a new, developmentally appropriate coding system for use with the FMSS in young populations. The Family Affective Attitudes Rating Scale (FAARS; Bullock & Dishion, 2004) aims to do just that by tapping into aspects of the FMSS that are not captured by the EE coding system and to provide an even more accessible and developmentally appropriate means of coding the FMSS. The purpose of the FAARS is to examine the attitudes, beliefs and attributions parents make about their children during the FMSS (Bullock & Dishion, 2004). The content of the speech sample is theorized to present parents' working schema of their children, which directly influences parenting behaviors and parent-child interactions (Sher-Sensor, 2015). The FAARS removes the emotional over involvement subscale of the traditional expressed emotion measure and allows for the inclusion of positive perceptions of children through the addition of a warmth subscale.

The FAARS consists of five primary subscales: criticism, warmth, family climate, respondent attributes, and quality of the sample. The first two, criticism and warmth, examine the attitudes and intentions the respondent attributes to the target and gives an overall rating of the quality of their relationship. The family climate subscale examines comments regarding the family environment, including overall climate, shared activities, and routines. Respondent

12

attributes refer to the coherence of the speech sample, whether the respondent is cooperative during the assessment, and if the coder picks up on feelings of ambivalence on the part of the respondent toward the target person. The final subscale is used to determine the quality of the speech sample and whether experimenter prompts may have influenced the final product (see Appendix A for a full list of items).

  Underlying theory of the FAARS. The behavioral-based theoretical underpinnings of the FAARS include Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001) and Coercion Theory (Patterson, 1982). RFT focuses on people's ability to relate events under arbitrary circumstances. Relational learning takes places when objects or events become paired/related because they share some qualities that bring them together. However, relational learning can also occur when events are not necessarily related formally but through arbitrary cues that have developed from past experiences. When we think, reason, speak, or listen, we create relations among events -- among words and events, words and words, events and events but these relations do not have to be formally related (Hayes, 2004). With respect to the FAARS, Relational Frame Theory refers to overlearned patterns of verbal behavior that form in response to dynamics within relationships (Hayes et al., 1999). These unconscious and automatic behaviors, or relational schemas (RS), are then exemplified through verbal processes associated with how an individual processes relational information and can thus be measured verbally through tools like the FMSS (Bullock & Dishion, 2004). Relationships take on meaning based on these processes or lenses through which an individual interprets, organizes, and ascribes meaning. Parents' learned verbal behavior patterns are then influenced by these RSs that guide actions (behaviors) and reactions (emotional responses) to their children and become stable representations that can then be assessed through the Five Minute Speech Sample.

The FAARS functions, in part, as a tool to better understand the familial processes associated with the development of conduct problems in children and as such, relies heavily on Coercion Theory as a base. In general, Coercion Theory argues that through a process of mutually negative reinforcement, parents strengthen children's problem behaviors through escape conditioning that elicits negativity in parents, which goes on to bolster a negative cycle of problem behaviors and negative responses until one of the parties "wins" (Patterson, 1982). Children respond to parents who are explicitly negative toward them on a regular basis by coming up with ways to "win" these battles through increased conflict and problem behaviors and eventually becoming socialized to respond negatively to their parent in general (Snyder et al., 1994). The FAARS combines RFT and Coercion Theory by examining how parents' cognitions about children (RFT and the way parents think about their children) feeds into negative behavioral cycles (Coercion theory).

Previous studies supporting the FAARS. The reliability of the FAARS, particularly for the use of the positive and negative relational schema subscales, has been suggested by moderate to strong internal consistencies (range, $\alpha = .67-.84$). No study to date has used the family climate subscale in their analyses. Previous work has attempted to establish validity in children and adolescents with conduct or behavior problems. Evidence of convergent validity can be seen in the significant associations between parental attitudes as measured by the FAARS and parental psychopathology, family functioning, antisocial behavior, and child behavior problems.

Four studies have been published using the FAARS. The first study using this coding system compared a small sample (*N*=40) of urban adolescents with antisocial behavior problems to adolescents without antisocial problems (Bullock & Dishion, 2007). Researchers report good internal consistency, high correlations with expressed emotion and observed parent-child

14

interactions, and can distinguish between the two study groups. Furthermore, parents' negative schemas about their children significantly predict antisocial behavior when controlling for previous problem behaviors and observed levels of coercion. In school aged children with externalizing problems, negative parental schemas have been related to higher rates of conduct problems as well as parenting behaviors, measures of family functioning, and symptoms of parental psychopathology (Pasalich, Dadds, Hawes, & Brennan, 2011). Waller and colleagues (2012) used the FAARS in a sample of at risk preschoolers and report good internal consistency and high inter-rater agreement. Results indicate that parents' attitudes about their children as expressed in the FMSS are associated with parenting daily hassles and levels of stress. These attitudes independently contributed to the prediction of conduct problems over the course of two years. Finally, in a large sample of caregiver-child dyads, negative schemas at age two were associated with more coercive parenting behaviors at age four, which then significantly predicted oppositional and aggressive behaviors four years later irrespective of child gender, cumulative risk, and positive attitudes (Smith, Dishion, Shaw, & Wilson, 2015). Taken together, these studies suggest that the FAARS may be a reliable and valid coding system that measures parents' schemas about children and adolescents, particularly in high-risk populations.

The FAARS coding system for parental FMSS holds clinical and research promise for a few reasons. First, the FAARS directly assesses parental perceptions of their child and their relationship with the child and some argue it may indirectly tap into broader affective states of the parent including levels of stress and psychopathology (Waller et al., 2012). Second, the inclusion of both negative/critical and positive/warmth related attitudes directly addresses some of the shortcomings of the EE system for use in children. Third, a brief coding system to go along with the easy to administer FMSS that is developmentally appropriate has implications for

use in a wide variety of contexts. Finally, specific to pediatric populations like asthma, the FAARS may provide a connection between illness related outcomes and children's proximal context of development, the family.

The FAARS in pediatric asthma. No study to date has used the FAARS in a pediatric sample. There is a long history in pediatric research of trying to understand how the proximal influences of the family "get under the skin" and influence child health outcomes. Included in those family factors of interest is often the parent-child subsystem and how that relationship can contribute to asthma symptoms and related outcomes. In general, research suggests that children growing up in environments with high levels of conflict have heightened emotional responses to stress, maladaptive coping strategies, and negative health outcomes (Repetti, Robles, & Reynolds, 2011; Valiente, Fabes, Eisenberg, & Spinrad, 2014). Studies specifically related to asthma populations have found factors like negative family emotional climate and parent-child interaction patterns to be related to asthma outcomes indirectly through internalizing symptoms (Wood et al., 2007, 2008) but few studies have examined how parents' perceptions of their child and subsequent parenting behaviors may play a role in these complex dynamics.

Pediatric asthma has been suggested to be a potentially stressful context for parents and caregivers (Silva et al., 2015) which can foster critical behavior in interaction with their children (e.g., Fiese et al., 2008). Compared to mothers of healthy children, mothers of children with asthma report more parenting stress and reduced quality in parent-child relationships (Carson & Schauer, 1992). Parenting a child with asthma involves not only regular parenting tasks and stressors, but these parents face a number of daily challenges associated with caring for the needs of the child such as filling prescriptions, avoiding allergens and emotional triggers, medication management and adherence, absence from school and work, sleep disturbances etc., and are at

risk for experiencing high levels of stress or burden associated with daily asthma care (Fiese et al., 2008; Silva, Crespo, Canavarro, 2014; Silva et al., 2015). The repetitive nature of these caregiving tasks can be burdensome and lead to a negative emotional climate in the family, and parents' negativity and criticism has been linked to rejecting parenting behaviors as well as negative asthma outcomes (Fiese et al., 2008 Fisher & Weihs, 2000; Wamboldt et al., 2000).

The FAARS may be applicable to most parenting situations with young children given that all parents experience some form of stress, but we reasoned it may be particularly applicable in high stress contexts where the consequences of increased stress, negative mental health, and compromised parenting are intensified by chronic health disease. As explained previously, the FAARS, based in part in coercion theory, is generally associated with children with externalizing problem; however, a broader perspective on this theory highlights why the FAARS may be suitable for parents of children with asthma. It may be that caregivers who are highly critical and develop negative relational schemas about their child are responding to various stressors associated with managing asthma related care (McCarty et al., 2004). One can also imagine a situation in which a negative cycle between parents and children developing if managing the child's asthma becomes a "battle". For instance, parent-child interactions may become difficult or hostile if the child refuses to take their medication or if the child has an asthma attack while playing with the neighbor's dog after being explicitly told not to by the parent. If these types of negative interactions become habitual, they could elicit negativity in parents, causing them to react with increasing hostility and criticism, which further reinforces the negative cycle. In fact, research suggests that parents of children with intermittent asthma report higher levels of burden and stress than parents of children with persistent asthma, suggesting that when asthma does not pose severe limitations on the child's functioning, caregivers may interpret their child's demands

for care as over and above the needs warranted by the illness (Silva et al., 2015). Parents' negative interpretation of their child's behavior then may then feed into negative interaction patterns. Coercion theory (Patterson, 1982) also suggests that children exposed to negative interactions with parents are at increased risk for developing the same negativity. Negative exchanges with parents may generalize across situations, including to those surrounding asthma care; thus, children may act out in response to highly critical parents, further feeding the coercive cycle and cementing parents' negative schemas.

It has also been well established that caring for an individual with chronic illness can lead to negative mental health outcomes for the caregiver. Not only does poor mental health compromise parenting practices, but maternal mental health has also been directly related to child health and asthma morbidity (Shalowitz, Berry, Quinn, & Wolf, 2001; Shalowitz et al., 2006). As suggested by Coercion Theory and previous research (e.g., Silva et al., 2015), the burden and stress associated with caring for a child with asthma can influence how parents interpret their child's behavior and lead to negative parent-child interaction patterns and potentially contribute to a negative coercive cycle. Caregivers interpretation of child behaviors may be further altered by the risk for poor mental health that comes along with increase stress and burden.

The applicability of the FAARS to parents of children with asthma can be related to these issues surrounding increased stress in parents and the mechanisms through which experiences of higher stress ultimately lead to negative child outcomes. Relational Frame Theory would suggest that parents' behaviors and emotional responses to their children are guided by their relational schemas. The relational schemas of parents at-risk for high levels of stress, whether from parenting in asthma or conduct disorder contexts, may be an important factor to understanding

the parent-child subsystem and its relation to child outcomes. In a pediatric illness context such as asthma, negative schemas could influence asthma management behaviors or parent-child interactions and ultimately child health outcomes. Identifying a system like the FAARS that could be reliable and valid for use in families of a child with asthma would allow researchers to tap into this pathway to better understand the association between parent and family factors and child health. In order to test this, we tested whether the FAARS was a reliable and valid measure of parental schemas in parents of children with asthma. We also attempted to replicate findings from previous studies that show a relationship between parental relational schemas and child externalizing problems, parent mental health, parenting behaviors, and family functioning (Pasalich et al., 2011; Smith et al., 2015; Waller et al., 2012). We also examined whether RSs are correlated with parental criticism and emotional over-involvement as measured by the original Expressed Emotion coding system of the FMSS.

Relational Schemas and Parent-Child Relationships

A schema is a way for the human brain to simplify the environment to make defining and responding to situations or people more efficient. Schemas help the brain determine the importance and meaning of cues. Schemas also provide a consistent basis from which to form expectations. *Relational* schemas (RS) refer to the link between people's past interpersonal experiences and their present approach to relationships. At a very basic level, RSs can be viewed as the "cognitive structures representing regularities in patterns of interpersonal relatedness" (p. 461; Baldwin, 1992). RSs are the assumptions regarding the self, others, and relationships that ultimately guide behavior. They link relationship experiences and future behavior. This next section will focus on parental relational schemas from two different perspectives – attachment

theory and cognitive psychology – and apply the construct of parental schemas to parents' behaviors.

Parental relational schemas. In the case of parents, relational schemas are assumed to be the set of implicit beliefs and attitudes about their children that guide subsequent parenting behaviors (Bullock & Dishion, 2007). Parental schemas can be adaptive when they are flexible and allow parents to identify problems accurately and formulate appropriate responses. Adaptive or positive schemas enable parents to evaluate the efficacy of particular responses and to adjust for more effective interactions with their children in the future. Maladaptive, or negative schemas tend to be rigid, overly simplistic and can be dominated by negative affect (Azar, Nix, & Makin-Byrd, 2005). For example, the schema a parent holds about their child's repeated "difficult" behavior may influence the parents' interpretation of the child as difficult. If the parent has a negative schema about the child, they may be more likely to display high levels of hostility toward the child, criticism, or have particularly negative interactions within the dyad. It may also increase the likelihood that the parent responds negatively to the child in other situations because of the schema the parent has developed about the child (Bullock & Dishion, 2007). Theoretically, this could contribute to coercive cycles of parent-child interaction.

In a pediatric illness context such as asthma, the consequences of negative relational schemas are particularly important to understand. If negative parent RSs result in high levels of hostility, criticism, or conflicted interactions, that could alter asthma management behaviors of the parent and/or heighten emotional responses of the child, both of which have been related to negative asthma outcomes (McCarty et al., 2004; Wood, 1993).

Internal working models. One way to think of parental schemas is in terms of internal working models (IWMs; Bowlby, 1982). Internal working models include a model of both the

social and non-social environments of the individual as well as a representation of the person's skills. According to attachment theory, behavior patterns are governed by these IWMs because they serve to regulate, interpret, and predict the caregiver's behavior (Mayseless, 2006). IWMs are often considered stable given their roots in past experiences with attachment figures but also flexible in that they can be updated and modified in light of new experiences and by the individuals changing abilities and capacities.

Bowlby's theory of IWMs is traditionally considered quite broad and is often viewed in relation to the parents' own attachment background. As research into parental representations has grown, however, the idea of IWMs has been applied to many relational representations as opposed to just working models in the context of the parent-child attachment relationship (Bretherton & Munholland, 1999). Extending the classical view of IWMs, each caregiver is expected to have a mental model of the environment that includes the care-receiver (the child), themselves, and how the caregivers' goals can be achieved and these schemas interact reciprocally to guide behavior (Bretherton, 1990).

IWMs provide the framework for parents' expectations about their children, which influence parent-child interactions down the road (Rosenstein & Horowitz, 1996). Some suggest that IWMs are key to understanding how people react, particularly in stressful situations. For example, parents of children with asthma are faced with the day-to-day stress of administering medications, managing environmental triggers, and worrying about asthma attacks. Those parents who have a history of secure attachment may have IWMs that support the idea that others will be available to provide help and support during children's asthma attacks, which will lead to less anxiety in the moment and better coping behaviors on the part of parents (Priel & Shamai,

1995). Thus, IWMs and attachment theory more broadly support the notion of an underlying relational schema that influences parenting behaviors as well as parent-child interactions.

     Cognitive representations or implicit attitudes. Similar to attachment theory, cognitive theories of parenting also highlight a sort of IWM or schema that acts to implicitly guide parents' behaviors. Underlying a cognitive framework of parenting is the idea that parents have beliefs and attitudes about parenting and their children that influence how they interpret and respond to events (Bugental & Johnston, 2000; McGillicuddy-Delisi, 1982; Sigel & McGillicuddy-DeLisi, 2012). These implicit attitudes are automatically-activated reactions that are unconscious and stable across situations (Sturge-Apple et al., 2015). This view posits that parents have models of their relationship with their child that function as cognitive maps to help navigate interactions with the child (Baldwin, 1992). Very similar to IWMs, these cognitive maps include representations of the self and the child along with a script for expected patterns of interactions that are developed through generalization and repeated experiences over time (Baldwin, 1992). Theoretically, cognitive schemas reflect a sort of latent structure that has formed over time through interactions with their child; descriptions of these schemas reflect perceptions of the child (Sturge-Apple, 2015), which subsequently filter environmental cues, focus parental attention, and guide parental behaviors (Sigel & McGillicuddy-DeLisi, 2012).

     Parental schemas and parenting behaviors. Together, IWMs and cognitive representation models suggest that parental schemas about their child could have significant effects on more explicit parenting behaviors. Thus, implicit attitudes and beliefs may be transferred from the caregiver to affect child outcomes through parenting behaviors. Indeed, empirical evidence shows a significant relationship between parents' working models of their child and their behavior during parent-child interactions (see Bugental & Johnston, 2000 for a

review). Those parents who have an insecure attachment history are more likely to react negatively to their own children and to have children who react in a reciprocally negative way (Bugental & Johnston, 2000). Assessments tapping into implicit cognitive schemas (e.g., the Go/No-Go Association Task) are related to observed parenting behaviors cross-sectionally as well as longitudinally in a way that explicit assessments (self-report questionnaires) of parenting attitudes and beliefs are not (Sturge-Apple et al., 2015). This holds true for families with a chronic illness as well. For example, in a sample of mothers with an infant with cerebral palsy, researchers found that maternal representations of herself and her child accounted for a significant amount of variance in mothers' feeding behaviors above and beyond children's developmental status and demographic characteristics, pointing to a unique association between maternal representations and behaviors (Sayre, Pianta, Marvin & Saft, 2001).

Parenting behaviors have also been conceptualized as the mechanism through which parental cognitions influence child outcomes, pointing to an indirect effect of parental beliefs on child outcomes (Murphey, 1992; Patterson, 1997). In general, cognitions and behaviors have been measured in a variety of ways and with a number of variables used as markers of the larger constructs. For example, mothers' harsh discipline practices (behaviors) have been found to mediate the relationship between hostile attribution style of the mother (cognitions) and children's externalizing problems (Nix et al., 1999). In asthma related contexts, having an asthma management plan and medication adherence have both been examined as important illness-related mediators when discussing asthma outcomes (see Rand et al., 2012 for a review).

This study proposes to use the Family Affective Attitude Ratings Scale as a method of assessing parents' relational schemas regarding their child. Consistent with the underlying premise that the FMSS reflects the emotional climate of the parent-child relationship, and the

underlying theoretical bases of the FAARS, this study links parents' implicit cognitions about their children as measured via the FAARS to parenting behaviors. Given that the FAARS has only been validated for use in populations with behaviors problems, this study aims to replicate previous findings that the FAARS is a reliable assessment tool for use with the FMSS and to examine the validity of the FAARS for use in caregivers of children with asthma.

Mental health, parenting schemas, and parenting behaviors. Because the assessment of relational schemas is based on parents' statements about their child, the parent's own psychological functioning is a particularly relevant topic when discussing parental attitudes (McCarty & Weisz, 2002). Parent mental health could be important in determining how parental relational schemas develop. Dix, Reinhold, & Zambarano (1990) theorize that parents' negative mood influences the way they interpret children's actions and that parents may interpret otherwise neutral behaviors as more negative by attributing those actions to being dispositional or intentional on the part of their children, thus creating negative schemas about children over time. They tested this theory by showing a group of mothers either angry, happy, or neutral videos. When asked to rate their children's behavior after watching these videos, mothers in the angry group made more negative attributions about their child's misbehavior, particularly when the child's behavior was neither clearly positive nor negative. This suggests that parents' own psychological symptoms may color their views of their children and thus their statements during the FMSS assessment (McCarty & Weiz, 2002). Both IWM and cognitive based theories of parental schemas highlight that parents' schemas pertaining to children and relationships are based in part on past experiences in relation with those children but also in part on the parents' own schema of themselves and relationships with others.

24

Depressive symptoms have been postulated to be part of those negative emotional states that influence parents. In fact, it is well established that depressive symptoms influence parenting (see Dix & Meunier, 2009 for a review). It seems logical that parents with depressive symptoms (e.g., negative mood, social withdrawal, lack of energy) would have a difficult time maintaining positive relationships, including with their children. Parental depression has been linked to deficits in parent-child relationships and child adjustment (Cummings, Schermerhorn, Keller & Davies, 2008), as well as a number of negative parenting behaviors including withdrawal from children, decreased sensitivity to their child's cues, and increased hostility and negativity (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). A meta-analysis of observational studies assessing depression and parenting behaviors found depressive symptoms to be most strongly related to irritability and hostility toward the child (Lovejoy et al., 2000). In addition, having a history of depression has been linked to more negative attitudes about one's child (Goodman, Adamson, Riniti, & Cole, 1994). The general model proposed by Dix & Meunier (2009) is a meditational one in which depressive symptoms influence parents' emotional and behavioral response to their child via some "cognitive" mediator. However, this meditational model has received mixed support empirically. Most studies focus on appraisal as the "cognitive" mediator, leaving a gap in the literature supporting this model.

Parental anxiety has also been the focus of research examining the relationship between mood and parenting behaviors. Compared with non-anxious controls, parents with an anxiety disorder are more likely to be highly critical and less likely to show positive regard and to encourage autonomy during parent-child interactions (see Turner, Beidel, Roberson-Nay, & Tervo, 2003 for a review). Much of the literature, however, focuses on the transmission of anxious symptoms from parent to child as opposed to the influence of parental anxiety on the

parenting process via schemas and parenting behaviors. While the link between anxiety and

negative parenting behaviors in general has been well established, studies examining how

anxiety influences parental schemas or cognitions about children are nonexistent.

This relationship between anxiety and depressive symptoms and parenting behaviors may

be particularly salient for families with a child with asthma for a few reasons. First, a recent

meta-analysis found that caregivers of children with asthma had more anxious and depressive

symptoms that caregivers of health children (Easter, Sharpe, & Hunt, 2015) and a number of

studies have shown maternal distress to be related to asthma outcomes (e.g., Bartlett et al., 2004;

Kaugars et al., 2004). Second, parents' depressive and/or anxious symptoms may influence

children's own emotional and physical regulation processes (Lim, Wood, Miller, & Simmens,

2011). One study of maternal depression and parenting in children with asthma found parental

depressive symptoms to predict both psychological and physical dysfunction in their children

(Lim, Wood, & Miller, 2008). Maternal depression was linked to child internalizing symptoms

both directly and indirectly through negative parenting behaviors. This relationship with

children's internalizing symptoms was the indirect pathway through which depression also

predicted asthma disease activity (Lim et al., 2008). One problem in the current literature,

however, is that the only child outcomes used are internalizing symptoms and asthma symptoms,

and parental anxiety has not been applied to these models even though empirical evidence

implicates both anxiety and depression in the influence of negative parenting behaviors. The

current study aims to build upon the model proposed by Dix & Meunier (2009) by including both

parental depression and anxiety as predictors and further exploring the link between depression,

anxiety, parenting behaviors and parenting cognitions. In addition, relational schemas act as the

"cognitive mediator" in the current model, adding to the research that has only used parents'

appraisals as an indicator of this construct.

Child Outcomes: Emotional Security

It is well known that parenting behaviors predict a range of child outcomes. However,

researchers have long questioned how parental attitudes are transmitted to – and internalized by -

children (Bugental & Johnston, 2000). One area of research has examined the emotional security

of the child as a possible variable tapping into this question, particularly in chronic illness

(Winter, Fiese, Spagnola, & Anbar, 2011). Emotional security is the child's fundamental sense of

safety and stability within the family and family relationships (Davies & Cummings, 1994; El-

Sheikh, Buckhalt, Cummings, & Keller, 2007). Low emotional security reflects less confidence

in the stability and safety of the family that leads to higher emotional and physiological arousal;

this could be particularly problematic for kids with asthma, a disease characterized by airway

restrictions that can be exacerbated by emotional and physiological distress (El-Sheikh et al.,

2007). Given that the family is the primary source of safety and security for young children

(Bowlby, 1982), children often look to the family, particularly caregivers, when challenging or

stressful situations arise and they need help interpreting and regulating the threat, and

maintaining equilibrium (Davies & Cummings, 1994; Gottman, Katz, & Hooven, 1996; Winter

et al., 2011).

Children with a chronic illness like asthma not only rely on caregivers for their healthcare

related needs but also look to parents and the family as a safe haven from the constant threat of

their illness (Winter et al., 2011). Research indicates that kids with poorly controlled or more

severe asthma have high levels of separation anxiety, less secure representations of the family

during story stem narratives and more internalizing symptoms (Fiese et al., 2010; Winter et al.,

2011). This suggests that the constant threat of asthma and asthma symptoms, as well as the lack of security-maintaining caregiver responses, take a toll on children's sense of emotional security and their confidence that the family will provide the security they are looking for.

Childrens' perceptions of parents as reliable and emotionally available is important for their normative development, and that they look to parents in times of stress to help deal with their own negative emotions (Stelter & Halberstadt, 2011). In less stable environments, or those with greater threat such as family instability or conflict, children exhibit less security in the family system (Winter, Davies, & Cummings, 2010). Insecure representations of caregivers as unreliable or even hostile may result in chronic stress for the child, lead to consistent and pervasive worrying about the family and their own well-being as well as maladaptive behavioral strategies to try and make up for the lack of security in the family (Cummings et al., 2008).

Child narratives assessed via story stem tasks. Narrative techniques such as children's story stem tasks are thought to provide insight into the meaning children derive from their experiences of past and expectations of future interactions within the family (Fiese & Spangola, 2005). Much like the internal working model the caregiver possesses of the child, children form IWMs of themselves and others that act as a lens of interpretation. These models solidify over time and form internal representations, or schemas, that guide the child's behavior in future situations (Bowlby, 1982). Child schemas are both intrapersonal, independently created outside social context, but also interpersonal and highly influenced by communication and relationship patterns with others, particularly caregivers (Oppenheim, 2006). Children rely on parents as sources of affection and security, to provide a lasting, dependable bond, for affirmation of their own worth, and a sense of reliable aid in uncertain circumstances (Furman & Buhrmester, 1985).

28

Story stems allow researchers to gain insight into children's schemas about family and caregivers by eliciting responses that tap into implicit representations about their safety and emotional security in the face of distress and disruption (Davies & Cummings, 1994). While the use of story stem tasks is not common in studies of children with chronic illness, some studies of children with asthma have used this technique as part of a multi-method approach. Narratives that display positive family functioning during routine events are related to fewer behavior problems as reported by the parent (Spagnola & Fiese, 2010) and children with more severe asthma hold perceptions of the family as less involved, less coherent, and less secure in the face of possibly threatening asthma situations (Winter et al., 2011). While the link between children's emotional security, family functioning, and asthma outcomes has been examined, the specific influence of parents' relational schemas and parenting behaviors on children's emotional security has yet to be established.

Putting it All Together: A Meditational Model of Parental Mental Health, Parental Schemas, Parenting Behaviors, and Emotional Security

Patterson (1997) proposed a meditational model in which parents' cognitions about their children influence child outcomes indirectly via their effect on parenting behaviors and empirical evidence supports this model (Bugental, Johnston, New, & Silvester, 1998; MacKinnon-Lewis et al., 1992; Nix et al., 1999). Dix and Meunier (2009) proposed a similar model that highlights an indirect link between parent mental health and parenting behaviors through a cognitive mediator. Although a large amount of research has looked at individual pieces of this model, we could find no study that examined parental mental health, parental schemas, parenting behaviors, and child outcomes in a single model. Given the evidence that suggests that the constant threat of asthma combined with inappropriate caregiver responses takes a toll on children's sense of emotional

security, this study proposes to examine children's emotional security as the outcome in a process model relating it to parental schemas and behaviors. Theoretically, a relationship between parents' relational schemas, the patterns of behavior resulting from those schemas, and children's sense of security within the family should be evident. If a parent holds a particularly negative schema about a child, which results in negative parenting behaviors, a child may interpret those behaviors as unreliable or hostile and be unable or unwilling to use the parent as a resource in a stressful situation like an asthma attack. This study combines the Patterson (1997) and Dix & Meunier (1990) models to examine whether parental depressive and anxiety symptoms influences parental schemas about their children, which are then associated with children's own schemas about the family indirectly via parenting behaviors (Figure 1).
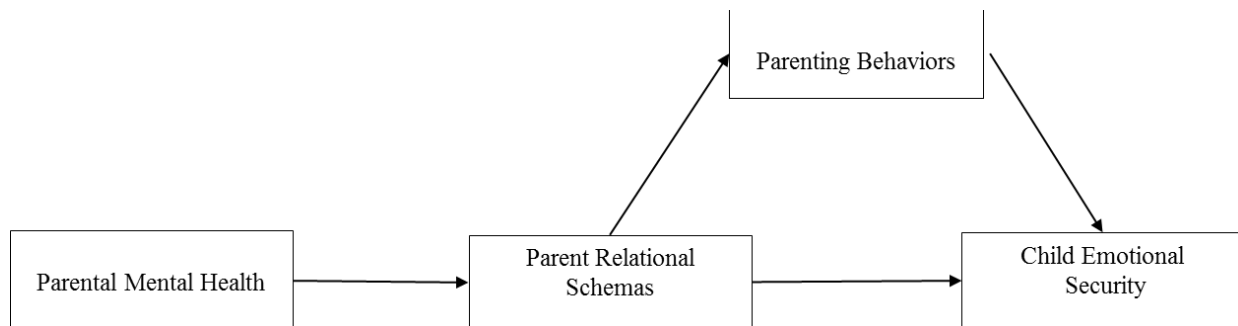
Figure 1. Proposed path model of the indirect effects of parent mental health and relational schemas on children's emotion security via parenting behaviors

The influence of child sex, age, maternal education, and asthma severity as covariates.

Parental schemas and parenting behaviors can be influenced by a number of variables other than those already proposed theoretically. Four possible covariates that could influence the model include child age, gender, asthma severity, and caregiver education. A brief review of why these variables were chosen is provided below.

Child age and sex. A number of studies have found no relationship between FMSS-expressed emotion and criticism and child age or sex (see Sher-Censor, 2015 for a review). However, there is evidence to suggest that these child characteristics are important when considering parents' relational schemas as well as parenting behaviors and children's emotional security. For example, as children get older, parents are more likely to believe children's behavior to be intentional and controllable and directly responsible for their misbehavior (Dix, Ruble, Grusec, & Nixon, 1986). In asthma populations, positive remarks during the FMSS has been negatively correlated with age such that parents of younger children make more positive remarks than parents of older children (Wamboldt et al., 2000). Given that this study includes both pre-school and school aged children, controlling for the influence of child age is important in order to assure that any significant effects in the proposed model are not due to the effect of child age on parental schemas or behaviors.

Theoretically, gender-based expectations can lead parents to interpret neutral information in biased ways (Baldwin, 1992). For example, one parent may dismiss aggressive behavior in their young son as "boys being boys" whereas they may be more likely to attribute behavior problems to a negative personality trait in girls. Some research suggests that boys and girls are differentially susceptible to parenting behaviors, with increased levels of parental control and the negative effects of maternal control being particularly salient for boys (Barber, Bean, & Erickson, 2002; Kiff, Lengua, Zalewski, 2011), while other empirical evidence points to girls being more sensitive to intrusive parenting styles (Jacobvitz & Sroufe, 1987). In addition, mixed results have been found when using the FMSS in children. Khafi et al., (2015) found parts of the FMSS to predict boys but not girls externalizing behaviors as well as sex differences in statements of attitude and statements exhibiting overprotective, self-sacrificing, and minimal

objectivity. Studies using narrative techniques have also found significant effects of child sex (e.g., Bohanek & Fivush, 2010). Similar to child age, we controlled for the effect of child sex on parental schemas, behaviors, and child emotional security in the proposed model.

Asthma Severity. Previous work using story-stems in school aged children with asthma has reported a relationship between objective lung function as measured via spirometry and children's representations of security within the family (Winter et al., 2011). In addition, asthma severity has been linked to a number of parenting attitudes and behaviors. Mothers whose children have more frequent asthma attacks tend to exhibit more critical attitudes towards their child (Hermanns, Florin, Dietrich, Rieger, & Hahlweg, 1989). Asthma medication adherence has also been linked to parental critical attitudes (Wamboldt, Wamboldt, Gavin, Roesler, & Brugman, 1995). Finally, more maternal rejection or interference has been linked to more severe asthma in young children (Nagano et al., 2010). This body of evidence suggests that children's asthma severity may influence parental schemas as well as children's emotional security and is a covariate in this study.

Caregiver education. Once again, FMSS-EE ratings have generally not varied according to parental education (see Sher-Censor, 2015 for a review). A deeper look into the literature, however, finds more mixed results. One study found mothers with high EE ratings for their first grader to have completed less schooling than mothers with low EE but that relationship did not continue as their child got older (Peris & Baker, 2000). Parental education has also been linked to the beliefs and behaviors of the parent as well as positive childhood outcomes (Eccles, 1993). Education has been uniquely related to maternal warmth (Klebanov et al., 1994), responsiveness during observed mother-child interactions (Huston & Aronson, 2005) and parental responsivity has been shown to mediate the relationship between parent education and child achievement

(Bradley & Corwyn, 2002). Waller and colleagues (2012) report non-significant effects of parental education on relational schemas using the FAARS. However, given the mixed evidence, in order to control for the effects of maternal education on the speech sample used in this study, education was also included as a covariate in this model.

Statement of the Problem and Study Hypotheses

While the Five Minute Speech Sample continues to be used in developmental research, the coding system most often used with this methodology (expressed emotion) is questionable. The FAARS shows promise as a developmentally appropriate coding system but has only been used in populations with behavior problems and has not been validated yet for use in children with a chronic illness such as asthma. Based on internal working models of attachment theory and cognitive frameworks on parenting, assessing parents' relational schemas of children may be important in understanding how parents influence childhood development. For children with asthma who rely on parents and caregivers for their emotional and health related security, an efficient, reliable coding system for the FMSS could be especially useful for researchers and clinicians. Identifying and using a coding system that aims to examine parents' implicit attitudes may allow researchers to better identify families at risk and help tailor behavioral interventions in the future. **Therefore, the first major goal of this study was to determine whether the FAARS is applicable to parents in a population of chronically ill, school-aged children as a coding system for the FMSS.** In order to achieve this goal, we (1) examined the psychometric properties of the FAARS by reporting on the reliability and validity of the measure, and (2) described the process of applying this coding system in a population of children with chronic illness. Based on previous literature we expected the FAARS to be psychometrically sound as evidenced by good inter-rater reliability, internal reliability, and construct validity.

As part of our examination of construct validity, we expected more negative relational schemas (NRS) to be correlated with more externalizing and internalizing problems in children, higher levels of mental health problems in parents, more negative parenting behaviors, and worse family functioning. We also expected positive relational schemas (PRS) to be related to better child outcomes in terms of fewer externalizing and internalizing problems as well as fewer mental health problems in parents, more positive parenting behaviors, and better overall family functioning. This will replicate previous psychometric work on the FAARS (e.g. Waller et al., 2012) and extend the literature by establishing whether similar patterns of results are found in chronically ill populations. In addition, we expect the criticism subscale of the FAARS to be related to the criticism subscale of the Expressed Emotion coding system given the evidence that parental criticism has shown to be consistently predictive of negative child outcomes in a number of populations. A more exploratory approach was taken in terms of the relation between the FAARS and the construct of emotional over-involvement as measured by the Expressed Emotion coding system because of the criticisms of both the construct and the scale as well as a lack of published evidence examining their relationship. The final goal of this study in relation to the psychometric properties of the FAARS was to determine the underlying factor structure of the measure. Although a sound theoretical basis for the development of the FAARS exists and psychometric properties have been good, no study has yet to examine the factor structure of the FAARS. Previous studies have made the theoretical assumption, for example, that the warmth and criticism subscales reflect the separate latent construct of positive and negative relationship schemas, but empirical evidence supporting this assumption is lacking. As such, if the structure of the FAARS was supported in the previous analyses, a Confirmatory Factor Analysis (CFA) was planned in order to establish the factor structure of the FAARS. We hypothesized a higher

order factor structure to be present, with the warmth, criticism, and family environment subscales loading onto a higher-order latent construct of relational schemas. The specification of a higher-order latent construct of relational schemas was expected to result in a well-fitting CFA model (Figure 2).
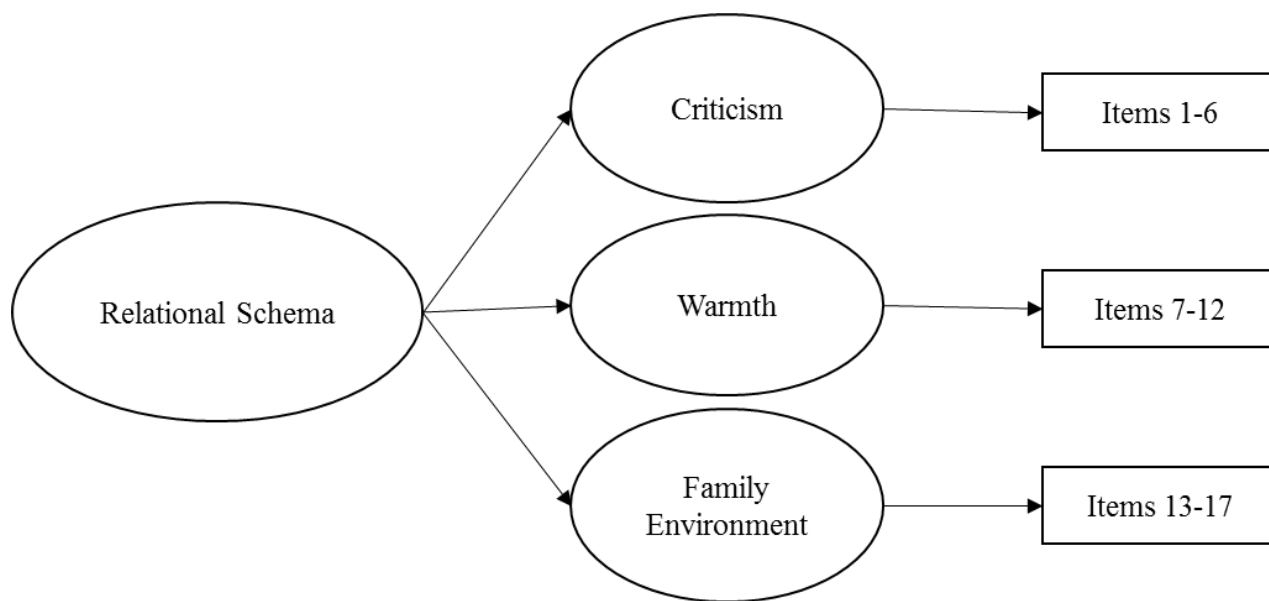
Figure 2. Hypothesized higher order factor structure of the FAARS

Given the inconstancies in the literature on how parents' beliefs about their child are transmitted to and influence their children's development, **the second major goal of this study was to test a process model whereby parental mental health and parents' schemas regarding their children and their relationships influence the development of children's emotional security over time directly and indirectly through parenting behaviors.** Based on previous studies that have identified parenting behaviors as a possible mediator between parent cognition and child outcomes, we proposed a path model whereby the relationship between parents' relational schemas as measured by the FAARS and child emotional security as measured by story stem narratives is mediated by parenting behaviors (Figure 1). **Addressing**

the second goal of the study (i.e., testing the proposed path model) was predicated on first supporting the use of the FAARS in this population (i.e., finding the FAARS to be psychometrically sound as evidenced by good inter-rater reliability, internal reliability, and construct validity).

The first path of interest in the proposed model was the relationship between parental mental health symptoms (mainly depression and anxiety) and parental schemas about their child. Previous work has linked parental mental health, particularly depression, to a number of negative parenting behaviors but less has been done to examine the influence of mental health on parenting cognitions. There is mixed evidence as to the association between the FAARS and parent psychopathology, with one study showing a correlation between NRS and depressive symptoms (Waller et al., 2012) and another showing a non-significant relationship (Smith et al., 2015). We hypothesized a significant direct effect of parent mental health on parental schemas. In addition, an indirect effect was planned in which parental schemas are the mechanism through which parents' anxiety and depression negatively influences parenting behaviors.

The second path of interest in the proposed model was whether parents' relational schemas about their children subsequently predicts their parenting behaviors during an observational parent-child interaction task. Historically, it has been difficult for researchers to link parenting cognitions (relational schemas) and parenting behaviors (Sturge-Apple et al., 2015) even though theory backs up this notion. One reason for this discrepancy between theory and empirical results could be the methodology used to test the hypotheses. Both constructs are traditionally measured via parent self-report but a number of problems exist when utilizing questionnaires to tap into implicit cognitive processes. Given our hypothesis that parental mental health significantly influences parents' relational schemas, not accounting for this relationship

36

while pursuing self-report measures could bias item responses. In addition, there is a question of whether self-report measures can even tap into more implicit processes like relational schemas. As such, measuring relational schemas and parenting behaviors through observational methodologies may be better suited to assess these complex constructs. We hypothesized a significant direct effect of relational schemas on parenting behaviors such that parents who hold negative relational schemas about their child will display higher levels of rejection and invalidation, and less autonomy during a parent-child interaction task.

Next, we planned to examine whether parents' relational schemas about their child would predict their child's emotional security within the family. In addition, we intended to test for the indirect influence of relationship schemas on child emotional security via parenting behaviors. This meditational model is in line with previous hypothesized models (e.g. Patterson, 1997) but had not been tested in a population of chronically ill children. The anticipated path of negative relational schemas to more rejection and less autonomy was to be extended such that these negative parenting behaviors would then predict lower levels of emotional security in the child. We hypothesized that the full model would fit the data well as evidenced by appropriate fit statistics and account for a significant amount of variance in the child's emotional security.

Method

Setting

Data from the Family Life in Asthma Project (FLAP) was used for the present study. FLAP was a longitudinal observational study, funded through the William T. Grant Foundation and the National Institutes of Health, which examined the effects of childhood asthma on family functioning. This study was designed to test how various family processes serve protective functions for children with asthma, with a focus on family routines, beliefs, and interactions.

Eligible families were recruited from a large city in the Northeastern United States through a local teaching hospital, a pediatric pulmonary clinic, and pediatric medical practices. Families were included in the study if they had a child between the ages of five and twelve years old with a confirmed diagnosis of asthma for at least one year. The child had to be on prescription asthma control medication for at least six months with the absence of any other chronic medical condition. The primary caregiver and their child were interviewed annually until the child reached age 12. The current study utilized data from the first, initial visit.

Participants

Participants included 215 children (63.3% male; M_{age} = 7.86) and their primary caregiver. Thirty-two Five Minute Speech Sample (FMSS) tapes were excluded due to a number of mechanical problems including blank tapes, tapes being recorded over, and significantly compromised audio quality such that understanding of the recording was limited, leaving a final sample of 183 families. Of the primary caregiver respondents, most were mothers (N = 166, 90.7%), with a limited number of fathers (N = 10, 5.5%), grandmothers (N = 1, 0.5%), and other caregivers (N =5; 2.6%) participating in this study. Most primary caregivers (M_{age} = 35.38, SD = 6.72) had at least a high school diploma (85.7%). Participants primarily identified themselves as White/Caucasian (64.5%) but also included African Americans (25.7%), Hispanic (2.7%), Native American (2.2%), and Asian (.5%) caregivers (4.4% indicated "other"). The sample was representative of the geographical area from which it was drawn.

Procedure

The original FLAP study was approved by the IRB of the data-collecting institutions. Prior to data collection, parental consent and child assent were obtained. Data was collected in a laboratory setting, with both caregivers and children filling out questionnaires and completing

study-related procedures while in the office. The Institutional Review Board at Virginia

Commonwealth University approved the FLAP dataset for secondary data analysis and gave

approval for the research team to listen to and code the FMSS audiotapes.

Measures

      Parental schemas. Following the protocol for the Five Minute Speech Sample (FMSS:

Magaňa et al., 1986), a research assistant read, verbatim, the following instructions to caregivers:

"I'd like to hear your thoughts and feelings about <insert child's name>, in your own words and

without my interrupting with any questions or comments. When I ask you to being, I'd like you

to speak for five minutes, telling me what kind of a person <insert child's name> is and how the

two of you get along together. After you begin to speak, I prefer not to answer any questions

until after the five minutes". The experimenter was not permitted to give prompts or answer

questions once the speech sample had begun. All FMSSs were recorded on a cassette tape. If a

secondary caregiver agreed to participate in the study, they were also asked to complete the

FMSS protocol but only the primary caregiver speech sample was used in this study.

      Expressed Emotion model. First, the tapes were coded using the Expressed Emotion

(EE) coding system developed by Magaňa et al. (1986). Five Minute Speech Samples were

transcribed and coded by a graduate student on the original FLAP project. As is typical, an

overall EE score was used in addition to the criticism and emotional over-involvement (EOI)

subscales. High criticism was scored if there was a negative initial statement (if the first sentence

described the child or their relationship negatively), a negative relationship rating (statement

indicating the caregiver and child did not get along well), or one/more critical remarks

(statements that are critical of the child's behavior and/or personality). High EOI was rated if

statements provided evidence for self-sacrificing/overprotective behavior, or emotional displays

during the interview including the following: self-sacrificing/overprotective behavior (reports of extreme or unusual sacrifice), extreme enmeshment, extreme overprotection, excessive detail about the past (when the caregiver gives detailed, unnecessary information about the child's distant past), statements of attitude (statements of love or willingness to do anything for the child), or excessive praise (five or more positive remarks). Based on classifications of criticism and EOI, each caregiver receives a final classification of either high EE (1) or low EE (0).

   The Family Affective Attitude Rating Scale. The Family Affective Attitude Rating Scale (Bullock & Dishion, 2004) was used to examine parental schemas. The FMSS was coded by a trained undergraduate and a graduate level research assistant. Coders met one to two times per week for several hours to discuss ratings and example FMSSs together. Discrepancies in codes were discussed until consensus was reached, with any disagreements or confusion discussed with a faculty mentor. After acceptable agreement was reached – i.e., coders achieved 80% agreement on five consecutive training samples – coding team members advanced to coding the recordings separately. The coding team continued to meet once per week for approximately one hour throughout coding to guard against coder drift and maintain inter-rater reliability. A total of 53 tapes (30%) were independently double coded and used to assess inter-rater reliability. The graduate researcher coded all tapes and those ratings were used in the current study analysis while the undergraduate ratings were used for reliability only.

   The FAARS is made up of 17 items grouped into three content scales (Appendix A): criticism (negative affective attitudes), warmth (positive affective attitudes), and family climate (Bullock & Dishion, 2004). The criticism scale is made up of six items that examine critical remarks about the child behavior and personality, conflict between the parent and child, negative attributions and intentions the parent makes regarding the child's behavior, and use of negative

humor or sarcasm. The warmth scale is made up of six items that examine positive remarks

about the child's behavior and personality, shared activities between the parent and child, and

positive intentions and attributions of the child's behavior. The family climate scale is made up

of five items that reflect a happy home environment, family cohesion, structured family routines

shared activities, and use of humor. All items are rated on a nine-point scale (1 = not at all/no

examples in the speech sample to 9 = multiple, clear examples in the speech sample). In addition

to content ratings, coders respond to four questions regarding attributes of the speech sample,

including consistency and coherence, cooperation, evidence of ambivalence toward the child,

and evidence the respondent was dismissive of the child. These questions are answered in yes/no

format.

  In order to meet the first primary aim of this study, substantive changes were not made to

the FAARS coding system. All attempts were made to code the FMSS tapes as described in the

original FAARS manual. However, some clarifications were made during training in order to

proceed. For example, distinctions between assigning scores of two, three or four were unclear

and rating discrepancies were unable to be clearly resolved; thus, we clarified that ratings should

be made such that a two was given to a speech sample in which one particularly weak statement

was made on an item, a three was given when one weak statement was made on an item, and a

four was given when two weak statements were made on an item. In addition, further distinction

was made when classifying a statement as referring to a behavior or a trait/personality: if a

behavior was deemed pervasive across situations by the coder, it was coded as both a behavior

and a weak trait. For example, "He is outgoing" was coded as an observable behavior as well as

a statement on the child's trait/personality because of the implied expectation of cross-situational

consistency. These clarifications were all made in consultation with the faculty mentor prior to the start of formal coding.

Child emotional security. The child's emotional security was assessed using child narratives via story stems. Children completed five story stems designed to assess their representations of their family in both routine and asthma related contexts (Winter et al., 2011). Children were presented with a story stem and asked to complete the story using family dolls and various props. Routine stems included one for dinnertime in a clean kitchen, dinnertime in a messy kitchen, family vacation, a special celebration, and bedtime. Following each routine stem, the experimenter then presented a challenging asthma context (e.g., asthma attack, forgot to take asthma medication) and asked the child to complete the story again. All story stems were videotaped and coded by members of the original FLAP research team.

For purposes of this study, the rating of emotional security was used. Ratings were made on a five-point scale ranging from very insecure, in which the child expects family responses to exacerbate the situation, to very secure, in which the child has a working model of the family as working together to restore harmony and protect the child's and family's well-being in the face of a mild threat. Emotional security was coded by a trained team of undergraduate research assistants from the original FLAP team. Emotional security (ES) scores were averaged across stories to yield and overall ES score. Interrater reliabilities for this data ranged from $\alpha = .71$ (emotional security scale) to $\alpha = .83$ (relationship expectations scale; Winter et al., 2011)

Parenting Behaviors. Together, children and caregivers completed a 15-minute interaction activity in which they were asked to construct a family crest during the initial lab visit. The interactions were videotaped and later coded via the System for Coding Interactions and Family Functioning (SCIFF; Lindahl & Malik, 2001). Two parenting behaviors were used in

42

this study: rejection & invalidation, and autonomy. Rejection and invalidation is based on the frequency and intensity to which parents make cruel, critical, insulting remarks to their children. Behaviors that are dismissive or ignore children's feelings are also included. The observations were coded on a five-point scale (1 = very low, parent does not reject or invalidate the child in any way; 5 = high, three or more instances when parents rejecting or invalidating comments or behaviors are of moderate to high intensity). Autonomy, which assessed whether parents recognize children as an independent, autonomous part of the interaction, was coded on a five-point scale (1 = intrusive/controlling, parent doesn't recognize child's needs or perspective and controls the task; 5 = high autonomy, parent actively seeks child's opinion and allows child to direct most of the task). All videotaped SCIFF interactions were coded by members of the original FLAP research team.

Caregiver mental health. The mental health of the primary caregiver was assessed using the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983), a 53-item measure in which caregivers are asked to rate the extent to which they have been feeling various symptoms (*0 = not at all* to *4 = extremely)* over the past week. There are nine subscales designed to assess the following groups: somatization (e.g. faintness or dizziness), obsessive-compulsive symptoms (e.g. having to check and double check what you do), interpersonal sensitivity (e.g. feeling inferior to others), depression (e.g. feeling no interest in things), anxiety (e.g. feeling tense or keyed up), hostility (e.g. having urges to break or smash things), phobia (e.g. feeling uneasy in crowds), paranoid ideation (e.g. others not giving you proper credit for your achievements) and psychotic symptoms (e.g. the idea that something is wrong with your mind). The depression and anxiety subscale scores were used in this study.

Child externalizing and internalizing symptoms. The Child Behavior Checklist

(CBCL; Achenbach & Rescorla, 2001) is a widely used measure that assesses various

competencies and problems children may present. Parents answer 140 questions on a three-point

scale ranging from 'not true' to 'very true or often true' regarding their children's behavior in

areas such as anxiety, somatic complaints, social problems, aggressive behavior, and attention

problems. The Externalizing and Internalizing Subscales of the CBCL were used in this study to

measure behavior problems in child participants. A meta-analysis of the utility of using the

CBCL to discriminate clinical and non-clinical populations (Seligman et al., 2004) found the

measure to reliably distinguish between youth with and without anxiety disorders as well as

externalizing disorders. The externalizing subscale has also been shown to accurately predict

diagnoses of Attention Deficit Hyperactive Disorder, Oppositional Defiant Disorder and Conduct

Disorder (Hudziak, Copeland, Stanger, & Wadsworth, 2004).

Child asthma severity. Lung function was used as a marker of asthma severity as

measured via spirometry. A trained respiratory therapist conducted the spirometry test during the

laboratory visit. Testing was done using a PDS 313100-WSU KOKO Spirometer (Pulmonary

Data Systems) to obtain spirometry measurements (force vital capacity, forced expiratory flow in

one second, and forced expiratory flow with 25% to 75% vital capacity). Each child performed

three maneuvers at rest into a spirometer and the test with the largest sum score of FVC and

FEV_1 was used for analysis. Asthma severity was defined using NIH guidelines and assessed by

a pediatric pulmonologist: FEV1 $\leq$ 40% of predicted = severe; FEV1 40% and $\leq$ 60% =

moderate; FEV1 > 60% and $\leq$ 80% = mild; and FEV1 80% or greater = slight, or normal,

ultimately yielding a 1-to-4 rating in which higher scores indicate more compromised lung

function. For this study, asthma severity was reverse scored so higher ratings indicated better lung function.

Family functioning. The Family Assessment Device (FAD; Epstein, Baldwin, & Bishop, 1983) is a 60-item self-report measure of family functioning. Subscales measure family variables such as problem solving, communication, roles, affective responses, and behavior control and caregivers were asked to rate how well each statement describes their own family on a 4-point likert scale. Total scores – which were used in this study - are the average across all subscales and higher scores indicate worse family functioning overall. Test-retest reliability has ranged from .66 to .76 and has demonstrated high internal consistency (α = .72 to .92; Miller, Epstein, Bishop, & Keitner, 1985).

Demographic information. Caregivers completed a demographic form that included child age, gender, race/ethnicity, as well as their own race/ethnicity, level of education, occupation and marital status.

Data Analyses

In order to meet the primary goals of this study, data analyses were divided into four stages related to each of the four hypotheses. Prior to testing hypotheses, bivariate correlations revealed that only caregiver education was associated with the positive relational schema (PRS) subscale. No other association between the FAARS subscales and proposed covariates was found. All reported results for the PRS include caregiver education as a covariate.

Hypothesis 1: The FAARS will be psychometrically sound as evidenced by good inter-rater reliability, internal reliability, and significant inter-item correlations. The first stage of analysis assessed the reliability of the FAARS through item descriptions, inter-item correlations, inter-rater reliability, and Cronbhach's alpha of the positive and negative relational

45

schema subscales. Weak correlations between the warmth and criticism scale will provide evidence that the two scales represent separate constructs. Inter-rater reliability (IRR) was assessed using a two-way mixed, consistency, single measure inter class correlations (ICC) to assess the degree that coders provided consistency in their ratings of relational schemas across subjects for each item of the FAARS. We used criteria from Cicchetti (1994) to assess ICC; ICC values less than .40 are considered poor, values ranging from .40-.59 are fair, values between .60-.74 are good, and ICC values of .75 or higher are excellent.

Hypothesis 2a: More negative relational schemas (NRS) will be correlated with more negative parenting behaviors, more externalizing and internalizing problems in children, higher levels of mental health problems in parents, and worse family functioning. The construct validity of the positive and negative scales was assessed by examining whether parents' scores on the NRS were associated with higher levels of externalizing and internalizing problems in children, more negative parenting behaviors, higher levels of depressive and anxiety symptoms in parents, and worse family functioning. Similarly, parents' scores on the PRS were hypothesized to be associated with lower levels of externalizing and internalizing problems in children, less rejection and more autonomy during the SCIFF, fewer reported depressive and anxious symptoms in parents, and better family functioning after controlling for caregiver education.

Hypothesis 2b: The criticism subscale of the FAARS will be related to the criticism subscale of the EE model. We will explore the relationship between EOI and the FAARS however, based on current criticism of the Expressed Emotion Model for use in children and a lack of published evidence examining EOI and its relationship with the FAARS, the results will be exploratory and no specific hypothesis is stated. The third stage of analysis

was designed to examine how the FAARS relates to Expressed emotion. The association between items on the FAARS and EE variables was assessed through correlation while controlling for caregiver education and child sex, both of which were found to be related to EE scores.

Hypothesis 3: A higher order factor structure of the FAARS will emerge, with the warmth, criticism, and family environment subscales loading onto a higher order latent construct, relational schema. The specification of a higher-order latent construct of relational schema (indicated by warmth, criticism and family environment) is expected to result in a well-fitting CFA model (Figure 2) and will be a better fit than a three factor structure and a single factor structure. The third and fourth stages of analysis were predicated on the reliability and validity of the FAARS as described above. A Confirmatory Factor Analysis using AMOS 23 was planned to examine the overall factor structure of the FAARS. According to Klein (1998), standard recommendations suggest a minimum of 10 cases (and a suggested 20) for every parameter estimated in a path analysis. Given the number of parameters in the hypothesized path analysis (10), the current sample size of 183 is above the recommended sample size, suggesting sufficient power to detect an effect if present.

The testing of three opposing models was planned, including the higher order factor structure (Figure 2), a three-factor model consisting of warmth, criticism, and family environment, and a single factor model in which relational schema is the latent construct. The fit of each model was to be evaluated conservatively by using a combination of fit indices including the chi-square value, Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA). The criteria to determine if each model adequately fit the data included a non-significant chi-square, a CFI of .90 or above (Bentler, 1992) and RMSEA of 0.08

47

or below (Browne & Cudeck, 1993). It is important to note that the chi-square value is very sensitive to sample size and should not be considered as a single factor when evaluating model fit. Because this study tested differing models, the Akaiek Information Criterion (AIC), the Browne-Cudeck Criterion (BCC) and Bayesian Information Criterion (BCI) were deemed most appropriate for comparing the models. The model associated with the lower value of these measure would be considered better fitting than those with large values (Meyers et al., 2013).

Hypothesis 4: Child emotional security will be indirectly related to parental RSs at T1 via parenting behaviors and parental mental health such that increased levels of depression and anxiety in caregivers will lead to more negative relational schemas. These NRs will result in higher levels of rejection and invalidation and lower levels of autonomy by the parent which will lead to less emotional security in the child a year later (Figure 1). If the FAARS was supported in the previous analyses, a path model (Figure 1) using AMOS 23 would be tested to examine the indirect of effect of parenting behaviors on the relationship between relational schemas and emotional security. Using 5000 bootstraps, the standardized path loadings, standard error, significance value and 90% confidence interval would be reported.

<div align="center">

Results

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Hypothesis 1: Psychometric properties of the FAARS – Reliability

      Item level descriptive statistics. Individual item means and standard deviations for the FAARS can be found in Table 1. Non-normality was evident in several of the items, as evidenced by significant skewness and kurtosis (items 3, 4, 6, 7, 9, 15, 18, and 19). While not unexpected, failure to meet the normality assumption of the general linear model (and most statistical analyses presented here) poses a challenge. Data transformations were considered as recommended by Tabachnick & Fidell (2007); however, given the goals of the present study the

decision was made not to transform items. More specifically, given that one primary goal of the present study was to evaluate and describe the use of the FAARS in a new population, transforming the items to fit a normal distribution clouds interpretation instead of enhancing it. While data transformations can improve precision in the data and force the data to fit within the assumptions of the statistical tests being used, they also significantly alter the values of the data, increasing the likelihood of misinterpretation and providing an obstacle for readers to compare transformed data with previous research using the same scale (Meyers et al., 2013). In addition, in order to meaningfully interpret transformed items, all items (including normally distributed items) would have to be transformed or standardized, making comparisons with previous studies using the FAARS difficult since no other study has transformed items.

Inter-rater reliabilities (IRR) ranged from fair to high (0.46-0.91; Cicchetti, 1994; Table 2) with the exception of items 4, 14, and 15. Item 4 (*negative humor/sarcasm*) was not included in the NRS subscale score in previous publications (e.g. Bullock & Dishion, 2007; Waller et al., 2012). In addition, given the low reliability as well as low incidence and range of scores present in this population (see Table 3), item 4 was dropped from further analyses. Similarly, items 14 and 15 had to be dropped due to low IRR (Table 2) and infrequent ratings (Table 5). In addition, no studies to date have reported reliability or descriptive statistics on family climate items (items 15-19). All other items were retained.

As shown in Table 6, inter-item correlations varied widely, ranging from 0.05 to 0.60. This is in direct contrast to previous studies using the FAARS, which found most inter-item correlations to range from 0.22 to 0.79 (Bullock & Dishion, 2007; Pasalich et al., 2011; Waller et al., 2012).

Subscale descriptives. As in previous studies, two subscales were calculated: negative relational schemas (NRS) and positive relational schemas (PRS). The NRS scale score consists of the mean of items 1, 2, 3, 6, & 7. The PRS scale is the mean score of items 8, 9, 10, 12, & 14 (see Table 7). There was a weak negative correlation (r = -0.26 p < .01) between the positive and negative subscales of the FAARS.

NRS. The mean NRS score was 2.27 (SD = 1.04), with a range of 1.00 to 5.40. Internal consistency, as indexed by Cronbach's alpha, was poor (0.56). As can be seen in Table 6, item 1 (critical behavior) was significantly correlated with all other NRS items but other items had limited association with each other. The *negative intentions* item (#4) correlated least with the other items in the NRS scale (range, 0.09-0.17; see Table 6).

PRS. The mean PRS score was 4.01 (SD = 1.33), with a range of 1.80 to 7.00. Internal consistency was poor (α = 0.48). As can be seen in Table 6, inter-item correlations were mixed, ranging from 0.05 to 0.25. For example, similar to previous studies (e.g., Waller et al., 2012) item 14 (*statements of love and caring*) correlated least in the PRS scale; it was only associated with reports of a *positive relationship with the target*, which was also associated with *positive comments regarding traits/personality*.

Family Climate. No published study to date has examined the family climate subscale of the FAARS. As mentioned previously, due to low (or incalculable) IRR, items 16 (*shared family activities*) and 17 (*clear expectations of target*) were dropped. The remaining three items assessing *family routines, humor in the family, and family climate* were not correlated with each other (except for a weak correlation between climate and routines, r = 0.18, p = 0.02). Given the lack of use of this scale in previous studies, little association between items, significant departure from normality in items as evidenced by large skew and kurtosis values, and very low frequency

in this sample (89-94% of the sample were rated as 1 or 'no evidence in speech sample'), these items were dropped from further analysis.

Taken together, evidence suggests that the items of the FAARS did not cohere as expected to reliability construct the subscale scores to be used in further analyses. Beginning with the low range of scores present in this sample (e.g., 69.9% of FMSSs were coded as having no evidence of *negative relationship with target*; see Table 3), followed by inconsistent inter-item correlations and low internal reliability of the subscales, the validity of using the NRS and PRS was called into question. Previous studies have found reliabilities to be acceptable, making comparisons with this study difficult to interpret. For these reasons, we did not proceed with the remaining analyses, including the Confirmatory Factor Analysis and the Path Analysis. Thus, hypotheses 2 and 3 were not tested.

Discussion

The purpose of this study was to evaluate a new coding system for use with the Five Minute Speech Sample in a pediatric population (children with asthma). The FMSS has promise for both research and clinical settings given the relative ease, minimal time, and low cost to administer. In fact, researchers of pediatric chronic illness have utilized it as a marker of the family climate in populations with asthma, autism spectrum disorder, and a number of psychiatric conditions (Sher Censor, 2015). However, the traditional coding system used with the FMSS (Expressed Emotion) has been questioned as an appropriate tool for use in children. Evidence is mounting, particularly in pediatric samples such as children with asthma, that key concepts in the EE model such as emotional over-involvement do accurately reflect family processes as described by that system. Thus, exploration of alternative coding systems that are

more developmentally informed, such as the Family Affective Attitude Rating Scale (FAARS), is warranted.

The FAARS uses Relational Frame Theory and Coercion theory, which focus specifically on interactions among young children and their parents, to suggest that parents' relational schemas about children influence childhood outcomes. While study to date have focused on children with externalizing and conduct issues, we were interested in examining whether the FAARS could be used in a population of children with asthma. We reasoned that the FAARS may be particularly applicable to parents in high stress contexts such as asthma where the consequences of increased stress, negative mental health, and compromised parenting are intensified by chronic health disease. In addition, given the theoretical assumption that parent schemas influence manifest parent behaviors in interactions with their children, we aimed to explore the cross-sectional association between parents' relational schemas and children's feelings of security within the family directly and indirectly through parenting behaviors. We hypothesized that more negative schemas would be related to more rejecting and authoritative parenting behaviors and worse emotional security in children with asthma.

Results of the current study do not support the use of the FAARS in pediatric asthma populations, particularly when examining the negative and positive subscales used in previous research (Bullock & Dishion, 2007; Smith et al., 2015; Waller et al., 2012). While past studies reported acceptable internal reliability and good construct validity both on the item and subscale (positive and negative relational schemas), we did not have evidence to corroborate the psychometric properties of the FAARS in families of children with asthma. As such, we were unable to test hypotheses related to the factor structure of the FAARS and the mediational model proposed (Figure 1). A number of issues arose during the coding process and data analysis that

may play a part in the null findings of this study. Some items (e.g., 5, 16, and 17) could not be reliably coded. Some items had a restricted range (and limited variance), which resulted in significant skewness and kurtosis. Inter-item correlations, particularly amongst the warmth items, were not high. The family climate items were rarely endorsed during the speech sample. Finally, items did not cohere into subscales as they have in previous studies. The remainder of the discussion centers on three key issues that may help to explain why this study's null results may have emerged: challenges applying the coding system, issues within the coding system itself, and the generalizability of the FAARS to populations beyond those high in externalizing behaviors (and the applicability of the FAARS to parents of children with asthma).

Challenges during coding

The null results from this study could stem directly from difficulties during coding, which may help explain unreliable items, limited variance, and low inter-item correlations. We obtained the FAARS coding manual from researchers who have successfully utilized the system in school-aged children. No training was required by the authors of the FAARS, suggesting that theoretically, our coding team should have been able to accurately replicate the system provided; however, we found that extremely challenging. Operational definitions of key constructs, distinctions between what constitutes "concrete" and "weak" statements, and procedures for how to determine final ratings were, at times, unclear and imprecise. The use of a nine-point scale combined with definitional ambiguity proved to be a challenge, particularly during reliability training. As such, it may be that our team simply applied the system inaccurately. For example, we had to add clarification to definitions (e.g., what constituted a statement regarding child "behavior" versus "personality/traits"), for the team to reach reliability. This could have resulted in a departure from the authors' intent; we could have misinterpreted instruction or other

53

definitions that might significantly alter coding methods and in turn the resulting rating. Without formal training and feedback, we cannot be sure of this.

Issues with the coding system

Ceiling effect. A ceiling effect, when a high proportion of subjects have maximum scores on the observed variable (Vogt, 2005), was detected for the *positive personality/trait* item. Many caregivers would start the FMSS by listing a number of good qualities about their child (e.g., "My child is so smart. He is very friendly and outgoing, and kind to other people."); this would immediately warrant a FAARS score of nine (on a 1-9 scale). As such, 76.5% (Table 4) of the current sample received a code of nine on this item, causing significant skew to the data and hindering analysis. This could have further misrepresented the overall study sample because actual variation in the data (across the entire five minutes) is not reflected in the scores obtained. In other words, this scale did not seem applicable to our sample is it is currently defined.

Weak vs. concrete statements. As shown in Appendix A, the rating system called for each statement to be identified as either a 'weak' or 'concrete' example of a given construct, and that categorization then influenced the final rating for each item. For instance, a parent could give 100 weak critical statements of behavior like, "He doesn't clean up after himself" or "He refuses to do his homework" over the course of the entire sample and receive a maximum score of five on the nine-point scale, while another parent could give two concrete critical statements (e.g., "He doesn't clean up after himself and I'm tired of cleaning up his mess" or "He refuses to do his homework and it drives me crazy") and receive a score of nine. Not only was the distinction between these weak and concrete examples problematic throughout the coding process, it calls into to question whether the codes really represent a "global impression and do not solely depend upon discrete pieces of information" (FAARS Coding Manual, 2005; p. 5).

The use of a tally system for a global rating. As previously mentioned, the FAARS is described by the authors as a *global* rating system in which codes represent a general impression of the speech sample in its entirety. A global rating should represent subjective estimates of quantity rather than direct behavior counts and is suitable when coders are required to summarize across behaviors and make molar ratings (Aspland & Gardner, 2003). Global coding is driven heavily by theory. In comparison, the use of a tally system, for example, highlights the presence or absence of a particular behavior while counting individual, discrete instances. Tally system ratings are then assigned based on specific frequencies of a given behavior; resulting ratings are therefore more data-based, removing some of the theoretical basis for the codes.

The FAARS manual instructs coders to avoid being heavily influenced by one example if the remainder of the speech sample contradicts that example. The coder is asked to make an inference based on the entire speech sample without letting one instance be of particular influence. However, the scoring instructions then suggest counting specific examples in order to reach item level codes. A "5" rating, for instance, represents either one concrete example or three or more weak examples. In order to meet this requirement, the coding team for this study used a tally system to count examples and final codes were given based on that count. While the manual calls for a global impression of the overall speech sample, the global rating delineations are not defined as such. There is little room for bumping ratings up or down according to the coder's interpretation of how statements map onto the theory of relational schemas. Thus, it is not clear whether the rating system reflects the latent theoretical constructs of interest. It is also not certain whether our team was able to apply the coding system in the same way as previous teams have, given the contradiction in instructions: did previous teams follow the directive to assign

ratings globally, based on overall impression, or follow the coding instructions to make delineations based on frequency counts?

The generalizability of the FAARS to other populations

The FAARS may not be applicable to parents of a child with asthma. While a number of problems arose related to coding procedures and the coding system itself, the results of this study may also have been a product of the sample from which data was obtained. It could be that the FAARS, as defined, simply does not apply to parents of children with asthma. As Chorney, McMurtry, Chambers, & Bakeman (2015) noted, just because a coding scheme fits the research question does not necessarily make it an appropriate system to use when applying those codes to a different context such as a new population. Using an established coding system in a different context, such as a new population, increases the risk that the coding system may not capture all the key behaviors or constructs within this new context or may capture constructs relevant in the original but not new population. This would help to explain, for example, why 84% of caregivers in this study were coded as 'no evidence in the speech sample' for the *assumes negative intentions* item (#4). It may be that parents of children with conduct disorder are particularly apt to assume negative intentions behind their child's actions. It may also be that parents of children with asthma are not making those negative assumptions and moreover, that their schemas revolve around something else entirely that is not currently captured by the FAARS coding system. We reasoned that the relational schemas of parents of children with asthma could be negatively influenced by the stress and burden of caring for a child with asthma and that this parenting experience would influence their perceptions of their children. However, results indicate that this may not be the case, at least for a community sample of asthma parents. The application of the FAARS in a new population either misses specific experiences related to

56

parenting a child with asthma or is particularly adept at tapping into parents' appraisals when their child has significant problem behaviors. That we were unable to replicate previous research in which the *criticism* and *warmth* items cohered reliably into two subscales, negative and positive Relational Schemas, may result from the FAARS not fitting the new context (children with asthma).

In this study, an important question then becomes what to expect from a FMSS of a caregiver with a child with asthma. For example, if the FMSS elicits relatively positive responses from parents of children with typical levels of externalizing behaviors, a main differentiating factor among families could be mention of negative traits. This notion is supported in that higher parental endorsement of the *assumes negative intentions* item was consistently associated with child variables such as poorer emotional security and higher internalizing and externalizing symptoms (Table 8). It may that the 10% of parents who scored high on this item *do* hold more negative perceptions of their child and offer a specific point of intervention. Research has linked parental criticism and rejection to noncompliance to medical regimens and higher hospitalizations (Wamboldt et al., 1995) as well increased child anxiety and lower quality of life (Fiese et al., 2008). Our results suggest that in a sample of families dealing with pediatric asthma, those children whose parents exhibit extreme negativity (within the sample) are at most risk for negative outcomes and thus, these families are in most need of intervention.

This study also highlights the possible role of <u>positive</u> schemas in parents of children with asthma. The *positive behavior* and *positive trait/personality* items were both associated with better lung functioning in the child (Table 8) and *positive trait/personality* was also related to lower parent anxiety and better family functioning, all of which have implications for better child outcomes in this population. In previous studies using the FAARS, results have paid particular

57

attention to the association between negative relational schemas and child outcomes (e.g., Pasalich et al., 2011; Waller et al., 2012) but our results suggest that for children with asthma, it may be particularly beneficial for parents to have positive schemas about their children. This fits theoretically when related to parenting behaviors in this population. For example, caregivers with positive schemas may also have better mental health or be part of more supportive families and thus be more likely to engage in successful asthma management behaviors, which leads to better pulmonary functioning in their child.

The salience of the child's asthma is further exemplified in the content of these speech samples. While the instructions of the FMSS do not ask caregivers to talk about the child's illness, it was very common for them to do so; content ranged from statements related to how stressful the child's asthma can be for the parent to the parents' pride in the child's ability to persevere through asthma related challenges. We attempted to code applicable statements when possible; however, often they did not fit into the FAARS framework. Constructs that may be particularly salient for parents of children with asthma may not be reflected in this coding system, suggesting that the selection of an applicable coding system for the FMSS may be more nuanced to the specific population as opposed to simply children or adults.

The FAARS is *particularly* applicable to families of children with conduct disorder. The FAARS arose partially out of Coercion Theory (Patterson, 1982), which emphasizes the coercive cycle between problem behaviors and negative parental responses, and as a result, has previously been used exclusively with families of a child with significant externalizing problems or conduct disorder. It may be that conduct disorder or externalizing problems pull for a negative schema about children with content particularly reflective of conduct disorder. The family climate of those with a child with conduct disorder may be qualitatively (as evidenced by

58

statements made in the FMSS) and quantitatively (through the FAARS) unique. Behavior

problems or challenging parent-child interactions may be more striking and salient for caregivers

of children with conduct disorder, leading to more negative content in schemas that emerge in

the FMSS. This is consistent with results found by Pasalich et al. (2011) who compared school-

aged children with externalizing disorders and non-clinical controls and found similarly low

levels of parental negative schemas in the control group. Within the FAARS rating scheme, in

order to be coded above a '5' on the nine-point *critical behavior* scale, for example, multiple

statements that also include a form of judgment must be made during the speech sample. In other

words, not only must the statement reflect a negative view of the child descriptively, it must also

place negative value on that description. While almost half of the current sample made at least

one weak critical statement regarding the child's behavior (i.e., described a negative child

behavior), very few samples (13.1%) included an explicit judgment statement; this limited scale

variability. Having a child with conduct disorder may foster more judgment regarding the child's

behavior than in non-clinical controls. The FAARS may rely on something unique about the

experience of parenting children with conduct problems that is not found in an asthma

population. Thus, while there may be an expectation for judgment surrounding behaviors in

children with externalizing problems, this is not the case for children with asthma.

It is also worth noting that there is overlap between asthma symptomatology and

externalizing problems in the population of interest. A meta-analysis found these children with

asthma exhibited more behavioral problems than healthy controls (McQuaid, Kopel, & Nassau,

2001). While the current sample did not display clinical levels of externalizing symptoms (*M*

=53.02, *SD* = 9.05; T scores less than 60 are considered in the normal range), ratings of

externalizing problems were significantly associated with several items on the FAARS (see

Table 8). In fact, post-hoc independent samples *t*-tests found caregivers of children with higher

externalizing problems (*N* = 30; score of 60 or above on CBCL externalizing subscale) to have

higher mean ratings of *critical personality/traits* [*M* = 3.83, *SD* = 2.35; *t*(169) = 2.16, *p* = 0.03],

negative relationship with target [*M* = 2.57, *SD* = 1.87; *t*(169) = 1.95, *p* = 0.05], and *assumes*

negative intentions [*M* = 2.60, *SD* = 2.14; *t*(32.78) = 3.19, *p* = 0.003, equal variances not

assumed] than caregivers of children within the normal range of externalizing problems.

Nonetheless, even if children with asthma can have elevated externalizing symptoms, that does

not mean they necessarily behave in a manner like children with conduct disorder, and the results

of this study suggests that caregivers may not be interpreting their children's behavior in the

same way.

Nonetheless, examination of results at the item level – taken together - could be

interpreted as suggesting the utility of the FMSS, and some components of the FAARS, as a way

of measuring schemas of parents of a child with asthma. However, it appears that the scales need

to be redefined to be used with parents of children who display typical levels of externalizing

behavior *and* the unique experience of having a chronic illness like asthma.

Future Directions

While the results of the current study do not support the use of the FAARS, as currently

defined, in pediatric samples such as families of a child with asthma, several future directions are

suggested. First, as can be seen in Table 8, there still may be some value in the FAARS when

examining specific items as opposed to subscale scores. An item-level analysis would allow for a

more in-depth understanding of how the *positive trait* and *positive behavior* items are relating to

better parent and family functioning as well as better child lung functioning; exploring whether a

particularly high level of positivity/warmth is key to better asthma outcomes or if a lack of

positivity/warmth is more important.

Similarly, a profile approach, in which *patterns* of responses are examined as opposed to

single items or subscales, may be an important future direction. This kind of analysis would

allow for a data-driven model as opposed to fitting a pre-determined model to the data as was

attempted in the variable-centered method here. In such an approach, the data in a new sample

would not be forced to fit previously-used scales. A pattern-based approach would also allow for

further examination of the approximately 10% of caregivers with particularly negative schemas

pertaining to the child's behavior and personality as opposed to averaging all scores to create a

single subscale. In addition, it may be that a combination of items or a pattern of ratings (e.g.,

parents who are high in criticism *and* low in warmth) would allow for identification of subsets of

caregivers with similar patterns in their speech sample. It may be that it is those families who are

in most need of intervention and that the FAARS, through a profile approach, can help to

identify families in need.

Given the overlap between asthma symptomatology and externalizing problems

evidenced in previous studies (McQuaid et al., 2001), a deeper comparative examination of the

FAARS in children with and without externalizing problems and with and without asthma is

warranted. Directly comparing these groups could shed light on whether clinically relevant

behavior problems are necessary to elicit the kinds of statements in the FMSS needed to

successfully code using the FAARS. Families with children with elevated externalizing problems

may have a unique set of experience that the FAARS draws upon compared to families with a

child with asthma; still, there may be overlap amongst these experiences, particularly given that

some studies have shown that asthma severity may be a risk factor for increased behavioral issues in children (e.g., Halterman et al., 2006; Blackman & Gurka, 2007).

Current findings also suggest a number of changes that could be made to the FAARS coding system. One option would be to consider condensing the scale from a nine to a five-point system. It was difficult to discern the meaningful difference, for example, between a score of a seven and eight, which could have made reliability difficult to achieve. An abbreviated scale might further help with the limited variability and non-normality in this study across several individual items. A five-point system could still capture significant negative or positive statements across different domains such as behavior, personality, and relationships while still allowing for variability within the sample. Testing a global approach to coding the FAARS in which coders assign one global rating for the positive and one global rating for the negative schema scale based on global descriptions of those codes. Alternatively, providing a precise description for each numerical rating for every item would coincide with an item-level approach.

The addition of asthma specific items may also be warranted given the salience of illness-related content within the current speech samples. For families with a child with asthma, including asthma specific items that code for asthma specific statements related to coping behaviors and or attitudes, perseverance on the part of the child, frustration due to illness, worries/concerns due to asthma, etc., may capture information missed with the current FAARS that is particularly important to this population. This scale could also provide insight into caregivers' illness related schemas and yield a meaningful construct that could be related to parenting behaviors such as medication adherence or managing environmental triggers. Previous studies have shown negative perceptions of their child's asthma to be related to greater parenting

stress (Svavarsdottir & Rayens, 2003), but research is needed to explore how parents' schemas about their child's illness relates to child outcomes.

Conclusion

In conclusion, the findings from this study suggest that the FAARS, in its current form, is not an applicable coding system for families of children with asthma. A number of problems arose during the coding process that could have affected the success of the coding and resulted in the current findings. However, item-level analyses suggest that there may be some utility in alternate approaches (e.g., item-level or profile approaches) as opposed to averaging items to create subscales when using the FAARS in this population. The practical advantages of a technique like the Five Minute Speech Sample in research and clinical settings makes the commitment to developing a reliable and valid coding system for use in pediatric populations important. Further research is needed to explore developmentally-informed alternatives to the Expressed Emotion model and to more clearly identify whether the FAARS can be tailored to assess the needs of families of children with asthma.

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Table 1. *FAARS item descriptive statistics*

	Critical behavior	Critical traits or personality	Negative relation with target	Assumes negative intentions	Negative humor/ sarcasm	Reports of conflict w/ anger hostility	Positive regarding behavior	Positive traits personality	Positive relation. With target	Assumes positive intentions	Reports engaging in shared activities	Statements of love/caring	Family climate	Family routines	Humor among family
Mean	3.50	3.04	1.93	1.54	1.31	1.36	3.58	7.92	3.51	2.64	2.68	2.33	1.28	1.31	1.14
Median	3.00	3.00	1.00	1.00	1.00	1.00	4.00	9.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Std. Deviation	2.05	2.12	1.74	1.45	1.13	1.02	1.69	2.13	2.52	2.13	2.85	2.06	0.85	1.20	0.56
Variance	4.23	4.49	3.03	2.11	1.27	1.03	2.86	4.56	6.35	4.53	8.12	4.24	0.72	1.43	0.32
Skewness	0.64	0.78	2.34	3.21	3.95	3.78	0.22	-1.91	0.91	1.42	1.40	1.63	3.15	4.50	4.34
Std. Error of Skew	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Kurtosis	0.11	-0.09	5.85	11.19	16.61	19.19	0.08	2.64	-0.10	1.67	0.43	2.15	9.46	21.70	19.56
Std. Error of Kurtosis	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	5.00	9.00	5.00

Table 2. *Inter-Rater Reliability of the FAARS*

Item	Cronbach's Alpha	ICC (95% CI)
1. Critical behavior	0.88	0.79 (0.66 – 0.87)
2. Critical trait/personality	0.66	0.49 (0.26 - 0.67)
3. Negative relationship	0.75	0.60 (0.40 – 0.75)
4. Negative humor/sarcasm	**0.43**	**0.27 (0.006 – 0.50)**
5. Assumes negative intentions	0.81	0.68 (0.51 – 0.80)
6. Conflict with anger/hostility	0.80	0.67 (0.50 – 0.80)
7. Positive behavior	0.88	0.78 (0.66 – 0.87)
8. Positive trait/personality	0.86	0.75 (0.60 – 0.85)
9. Positive relationship	0.89	0.79 (0.67 – 0.87)
10. Assumes positive intentions	0.86	0.75 (0.61 – 0.85)
11. Shared activities with target	0.92	0.85 (0.76 – 0.91)
12. Statements of love/caring	0.96	0.91 (0.86 – 0.95)
13. Family climate	0.72	0.56 (0.35 – 0.72)
14. Shared family activities	**0.39**	**0.24 (-0.03 – 0.47)**
15. Clear expectations of target behavior*	N/A	0.00 (-0.27 – 0.27)
16. Family routines	0.77	0.62 (0.42 – 0.76)
17. Humor among family	0.63	0.46 (0.22 – 0.65)

*Note: Scale has zero variance and reliability could not be calculated.

Table 3. *Frequency of scores for each criticism item of the FAARS*

Score	Critical Behavior		Critical Personality/Traits		Negative Relationship with target		Assumes Negative Intentions		Negative humor/ sarcasm		Anger/Hostility	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1.00	48	26.2	74	40.4	128	69.9	154	84.2	169	92.3	158	86.3
2.00	3	1.6	7	3.8	1	0.5	3	1.6	0	0	1	0.5
3.00	49	26.8	35	19.1	31	16.9	10	5.5	2	1.1	15	8.2
4.00	29	15.8	15	8.2	10	5.5	1	0.5	0	0	6	3.3
5.00	30	16.4	28	15.3	5	2.7	12	6.6	11	6.0	2	1.1
6.00	7	3.8	15	8.2	1	0.5	0	0	0	0	0	0
7.00	9	4.9	3	1.6	1	0.5	0	0	0	0	0	0
8.00	2	1.1	1	0.5	2	1.1	0	0	0	0	0	0
9.00	6	3.3	5	2.7	4	2.2	3	1.6	1	0.5	1	0.5
Total	183	100.0	183	100.0	183	100.0	183	100.0	183	100.0	183	100.0

Table 4. *Frequency of scores for each warmth item of the FAARS*

Score	Positive Behavior		Positive Personality/Traits		Positive Relationship with target		Assumes Positive Intentions		Shared Activities		Statements of love/caring	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1.00	34	18.6	6	3.3	60	32.8	93	50.8	129	70.5	114	62.3
2.00	4	2.2	2	1.1	6	3.3	2	1.1	0	0	1	0.5
3.00	52	28.4	5	2.7	47	25.7	41	22.4	1	0.5	28	15.3
4.00	36	19.7	0	0	18	9.8	15	8.2	1	0.5	12	6.6
5.00	42	23.0	17	9.3	18	9.8	16	8.7	27	14.8	12	6.6
6.00	7	3.8	11	6.0	9	4.9	6	3.3	0	0	8	4.4
7.00	4	2.2	2	1.1	4	2.2	1	0.5	0	0	0	0
8.00	3	1.6	0	0	3	1.6	0	0	0	0	2	1.1
9.00	1	0.5	140	76.5	18	9.8	9	4.9	24	13.1	6	3.3
Total	183	100.0	183	100.0	183	100.0	183	100.0	183	100	183	100.0

Table 5. *Frequency of scores for each family climate item of the FAARS*

Score	Family Climate		Shared Family Activities		Clear Expectations of target behavior		Family Routines		Humor among family	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1.00	163	89.1	162	88.5	176	96.2	169	92.3	172	94.0
2.00	0	0	1	0.5	0	0	0	0	0	0
3.00	14	7.7	9	4.9	2	1.1	5	2.7	9	4.9
4.00	1	0.5	3	1.6	1	0.5	0	0	1	0.5
5.00	5	2.7	7	3.8	4	2.2	5	2.7	1	0.5
6.00	0	0	0	0	0	0	2	101	0	0
7.00	0	0	1	0.5	0	0	0	0	0	0
8.00	0	0	0	0	0	0	0	0	0	0
9.00	0	0	0	0	0	0	2	1.1	0	0
Total	183	100.0	183	100.0	183	100.0	183	100.0	183	100

79

Table 7. *Descriptive statistics, reliability, and correlations for the subscales of the FAARS*

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Critical behavior	1													
2. Critical traits/personality	0.32**	1												
3. Neg. relationship with target	0.25**	0.23**	1											
4. Assumes negative intentions	0.17*	0.14	0.09	1										
5. Reports of conflict with anger/hostility	0.23**	0.03	0.60**	0.08	1									
6. Positive behavior	-0.01	-0.02	-0.06	-0.09	-0.05	1								
7. Positive traits/personality	.0.07	-0.01	-0.19**	-0.24**	-0.07	0.25**	1							
8. Pos. relationship with target	-0.26**	-0.14	-0.18*	-0.13	-0.08	-0.01	0.15*	1						
9. Assumes positive intentions	-0.01	0.05	-0.13	-0.13	-0.06	0.40**	0.26**	0.07	1					
10. Statements of love/caring	-0.15*	-0.03	-0.11	0.00	-0.09	0.09	0.10	0.25**	0.05	1				
11. Family climate	0.03	-0.03	-0.09	0.08	-0.07	0.01	0.14	0.12	0.13	-0.13	1			
12. Shared family activities	-0.02	-0.05	0.04	0.08	-0.03	-0.14	-0.12	0.04	-0.10	-0.07	.22**	1		
13. Clear expectations of target behavior	-0.09	-0.06	0.03	-0.08	0.07	0.06	0.10	0.13	0.01	--0.12	-0.06	0.20**	1	
14. Family routines	-0.04	-0.03	0.03	0.11	0.06	-0.13	-0.14	-0.02	-0.05	-0.08	0.18*	0.22**	0.09	1
15. Humor among family	-0.06	0.00	0.05	-0.04	0.18*	0.04	0.12	0.17*	0.01	0.04	0.08	0.13	0.25**	-0.06

Note: * = $p < .05$; ** = $p < .01$

FAARS Scale	Mean	Standard Deviation	Minimum	Maximum	Correlation between subscales	Cronbach's α
Negative Relational Schema (NRS)	2.27	1.04	1.00	5.40	-0.26**	0.56
Positive Relational Schema (PRS)	3.99	1.21	1.00	7.20		0.48

Table 8. *Correlations between items on the FAARS and parent, child, and family validity measures*

FAARS Item	Caregiver Depression	Caregiver Anxiety	Family Functioning	Authority	Rejection	Emotional Security	Externalizing Symptoms	Internalizing Symptoms	Pulmonary Function
1. Critical behavior	0.08	0.02	0.01	-0.04	0.05	-0.08	0.10	0.09	0.00
2. Critical traits/personality	0.01	0.00	0.13	-0.08	0.00	-0.08	0.23**	0.20**	-0.07
3. Neg. relationship with target	-0.08	-0.04	0.09	0.04	-0.07	0.03	0.16*	0.16*	-0.06
4. Assumes negative intentions	-0.04	0.03	0.02	-0.13	0.07	-0.17*	0.25**	0.26**	-0.15
5. Reports of conflict with anger/hostility	-0.02	-0.06	-0.02	00.03	-0.17	0.01	0.02	-0.03	0.04
6. Positive behavior	-0.11	0.06	0.00	0.00	-0.10	0.17*	-0.09	-0.09	0.17*
7. Positive traits/personality	-0.13	0.06	-0.17*	0.08	-0.05	0.04	-0.20**	-0.19*	0.18*

8. Pos. relationship with target	-0.01	-0.18*	-0.13	0.05	-0.01	0.11	-0.14	-0.11	-0.10
9. Assumes positive intentions	-0.11	-0.04	-0.13	0.06	-0.08	0.09	-0.05	-0.08	0.15*
10. Statements of love/caring	0.07	0.15*	-0.03	-0.04	0.01	-0.04	-0.08	-0.02	-0.12

Note: $* = p < .05; ** = p < .01$

Appendix A. FAARS Coding Sheet

CRITICISM	Not at all 1	2	3	4	Somewhat 5	6	7	8	Clearly/ Multiple Examples 9
1. Critical regarding behavior of target									
2. Critical of traits or personality of target									
3. Negative relationship with target including signs of anger, resentment, and/or contempt									
4. Negative humor/sarcasm regarding target									
5. Assume or attributes negative intentions of the target									
6. Reports conflict with/anger or hostility toward target									
WARMTH									
7. Generally positive regarding target's behavior									
8. Generally positive regarding traits or personality of target									
9. Reports positive relationship with target									
10. Assumes or attributes positive intentions of target									
11. Reports in engaging in shared activities with target									
12. Statements of love/caring toward target									
FAMILY CLIMATE									
13. Attributes of family climate- happy home environment									
14. Shared family activities- evidence of specific behavior									
15. Articulation of clear expectations regarding target's									

behavior								
16. Structured regular family routines								
17. Humor/laughter among family members								

RESPONDENT ATTRIBUTES

18. Respondent report consistent and coherent   Yes   No

19. Respondent appears ambivalent about feelings
Toward target and relationship with them   Yes   No

20. Respondent dismissive of target person   Yes   No

21. Respondent cooperative   Yes   No

CHARACTERISTICS OF SPEECH SAMPLE

22. Proper examiner prompts: _____ Total

23. Improper examiner prompts: _____ Total

24. Compromised audio quality?   Yes   No

25. Interruptions during speech sample?   Yes   No

Vita

Jessica Lynn Greenlee was born on March 15, 1987 in Biloxi, Mississippi. She received a Bachelor of Arts in Psychology from Kenyon College in 2005 and subsequently served as the Project Coordinator for a number of research projects at Vanderbilt University and The University of Alabama. She is currently living in Richmond, Virginia with her husband and is working towards her doctorate in Developmental Psychology at Virginia Commonwealth University.