1-1-2013

The Influence Of Parent-Child Conflict And Stressful Experiences On The Health Of Youth With Asthma

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THE INFLUENCE OF PARENT-CHILD CONFLICT AND STRESSFUL EXPERIENCES ON THE HEALTH OF YOUTH WITH ASTHMA

by

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THESIS

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

2013

MAJOR: PSYCHOLOGY (Clinical)

Approved by:

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Advisor Date

ACKNOWLEDGEMENTS

I would like to thank, Dr. Richard Slatcher, for his time and dedication in the preparation of this thesis. His support throughout the project was greatly appreciated. I would also like to thank the members of my thesis committee, Dr. Annmarie Cano and Dr. Christopher Trentacosta, for their assistance in enhancing the quality of this project. I would also like to thank all individuals who assisted in collecting these data along with the participants who graciously volunteered their time to contribute to research. Finally, I would like to thank Adam, my family, and friends for their unwavering support and patience, which have been instrumental in the competition of this thesis.

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CHAPTER 1

INTRODUCTION

Asthma is a chronic disease that can limit a child or adolescent's quality of life. This chronic illness is characterized by the manifestation of recurrent and reversible respiratory obstruction and involves wheezing, coughing, chest tightness, and/or shortness of breath (Kaugars, Klinnert, & Bender, 2004). Currently, asthma affects over 10 million children and adolescents in the United States, with rates increasing by 4.3 million in the last ten years and climbing fastest among black children (CDC, 2011). Asthma during childhood and teen years has shown to impact quality of life due to symptom expression and also limitations placed on a youth's daily activities, such as sports, school, and work (Juniper, 1998). Asthma not only impacts children's daily functioning but the whole family unit. Asthma accounts for 12.8 million missed days of school a year, and, in turn, causes 30% of parents who have a child with asthma to miss days of work due to their child's illness (Laforest et al., 2004; Moorman et al., 2007). Research also indicates that there are socio-demographic influences associated with asthma diagnoses and care, such that children and adolescents raised in poor families are 17% more likely to be diagnosed with asthma than those who are not poor (CDC, 2011). Further, black children and adolescents with asthma have a 260% higher emergency department use rate compared to white children and adolescents with asthma (Akinbami, 2006). These health disparities facing youth with asthma can increase the amount of stress the child and their primary caregivers experience on a day-to-day basis.

Research evidence has demonstrated that children with asthma are at risk for the exacerbation of their disease from contextual factors, including living in a disadvantaged neighborhood, growing up in poverty, additional health problems, family stress, and individual

behavioral factors, including comorbid psychological disorders (Bussing, Halfon, Benjamin, & Wells, 1995; Christaanse, Lavigne, & Lerner, 1989; Koinis-Mitchell et al., 2010; MacLean, Perrin, Gortmaker, & Pierre, 1992; Weil et al., 1999). Although there are many factors, including biological and environmental, that interact to impact asthma morbidity, the purpose of this study is to assess the impact of the parent-child relationship, specifically parent-child conflict, on asthma morbidity and additional complicating health factors (e.g., obesity). This study takes a multi-method approach to the assessment of parent-child conflict using a variety of measures, including clinical interviews, parent and child self-report questionnaires, and an innovative naturalistic observation method, to determine which measures of conflict show the strongest links to physical health outcomes. Further, the impact of recently experienced stressful life events by the parent and child on child physical health will be explored. The study will also determine if conflict specific to the parent-child relationship accounts for unique variance above and beyond general conflict in the family environment when predicting physical health outcomes. Lastly, the study will examine the impact of peer relationships as a potential moderator of the effects of parent-child conflict and stressful experiences on physical health.

Risky Family Relationships and Health

Throughout child development, family relationships have been implicated in shaping current and future health outcomes (Repetti, Taylor, & Seeman, 2002; Shonkoff, Boyce, & McEwen, 2009). Families with repeated expressions of anger and aggression in conjunction with recurrent conflict can be particularly damaging to a child's physical health, which may prove to be especially problematic for children with a preexisting chronic illness such as asthma (Miller & Chen, 2010; Repetti, et al., 2002). The Risky Families model described by Repetti et al. (2002) theorizes that frequent conflict and unavailable, neglectful family relationships with an

absence of emotional support put children at risk for psychological and physical health problems later in life. They propose that these undesirable family relationships have damaging effects on both psychological and biological processes in children, which increases these individuals' risk for developing chronic health problems in adulthood. Exposure to family dysfunction as a child increases risk for adult diseases, including heart disease, cancer, lung disease and liver disease (Felitti et al., 1998; Repetti, Robles, & Reynolds, 2011). The current literature supports the importance of family relationships and their effects on health, which will be discussed in more detail below.

Effects of Risky Family Environments on Physical Health

Children raised in families with high levels of conflict, lack of family support, and/or availability face an increased risk for a variety of health problems. Evidence suggests that family conflict can influence health early in childhood and that these negative effects can extend into adolescence and adulthood (Luecken & Lemery, 2004). For example, a study of early parent-child interactions demonstrated a strong association between conflict in the home and lower infant weight attainment when observing at-home interactions (Stein, Woolley, Cooper, & Fairburn, 1994). Further, in a study of over six thousand children, family conflict was independently associated with slow growth up to 7 years of age when controlling for social status, sex, and predetermined height (Montgomery, Bartley, & Wilkinson, 1997). Additionally, adolescents who witness or who are involved in severe verbal arguments in their home have significantly greater levels of depression, anger, and anxiety (Gunnlaugsson , Kristjansson, Einarsdottir, & Sigfusdottir, 2011). These studies illuminate the consequences that early family conflict has on a child's physical and psychological development early in life but fail to specifically assess the specific impact of conflict between youth and their primary caregivers.

Recent evidence suggests that there are lifelong consequences of growing up in a risky family environment. The Adverse Childhood Experiences Study of more than 17,000 adults indicated that those exposed to family violence and neglect in childhood had significantly higher rates of cardiovascular disease, autoimmune disorders, and even premature death (Anda et al., 2009; Dong et al., 2004; Dube et al., 2009). Additional work has demonstrated that parent-reported conflict in families is associated with higher total cholesterol levels and increased high-density lipoprotein in otherwise healthy adolescent males (Weidner, Hutt, Connor, & Mendell, 1992). Further, in a study investigating the prospective effects of family conflict on health, adult men who described a tumultuous relationship with a parent were more likely to be diagnosed 35 years later with a serious medical condition, including asthma, arthritis, heart problems, and depression (Stewart-Brown, Fletcher, & Wadsworth, 2005). Together, these studies highlight the wide-ranging impact of a high-conflict family life on poor health outcomes. But despite the accumulation of evidence that growing up in a risky family environment is associated with more health problems later in life, little is known about the specific pathways through which risky family environments have their effect on health. By narrowing the focus on the influence of the parent-child relationship, this study seeks to make contributions to the growing-body of evidence on the links between risky family environments and physical health in late childhood and adolescence.

Risky Families and Asthma

Asthma is a major childhood health problem resulting from the complex interaction of environmental and genetic factors that can be exacerbated by psychosocial difficulties, including poor family relationships (Kaugars, et al., 2004). Parental stress, marital conflict, and family conflict are all factors of family relationships that are known to influence childhood asthma

(Chen, Bloomberg, Fisher, & Strunk, 2003; Northey, Griffin, & Krainz, 1998; Shalowitz, Berry, Quinn, & Wolf, 2001). Evidence suggests that early family environment and emotional climate coupled with genetic risk affects both the onset and severity of asthma (Kaugars, et al., 2004). Further, research has demonstrated that children with asthma lacking quality family relationships and encountering frequent family difficulties have greater symptom expression that may elicit more frequent asthma attacks (Chen, Chim, Strunk, & Miller, 2007; Sandberg et al., 2000).

Recent empirical studies indicate that family factors influence asthma morbidity and daily asthmatic functioning. Children with low levels of family support have marginally greater daytime asthma symptoms and significantly greater nighttime symptom expression in a 2-week period; additionally, low levels of family support are linked to decreased pulmonary function (Chen, et al., 2007). Researchers have theorized that families high in conflict have difficulty communicating effectively and fail to supervise proper medication compliance, which leads to poor division of responsibilities and adherence—exacerbating the impact on a child's daily functioning and even asthma severity (Schobinger, Florin, Reichbauer, Lindemann, & Zimmer, 1993). Additionally, evidence has demonstrated that parental characteristics can impact asthma morbidity such that children with asthma and highly critical mothers have an increased frequency of asthma attacks and asthma severity (Kaugars, et al., 2004; Schobinger, et al., 1993). Children with asthma raised in a harsh family climate also report greater depressive symptoms, which both directly and indirectly have been demonstrated to exacerbate disease severity (Wood et al., 2007). Additional family characteristics such as poor caregiver mental health, family disorganization, and minority ethnicity are all contributing components by which family environment and stress can exacerbate the asthma symptom profile (Bauman et al., 2002; Bender et al., 2000; Miller & Wood, 1991). The research to date has mostly focused on the extent to

which family characteristics, like family conflict and stress, impact pediatric asthma morbidity without examining the influence of particular aspects of daily family life, such as parent-child conflict and stressful events experienced by the youth or caregiver, on the health of youth with asthma.

Family conflict is a construct that typically is measured via self-report. When investigating the relationship between parent-child conflict and health, it is important to ask: who is the most predictive and reliable informant—the parent or the child? A majority of the research to date utilizes a child self-report strategy or parental interview, but rarely both. A key question this study strives to answer is whether child- and parent-reported conflict are uniquely predictive of asthma morbidity or if one is more predictive than the other. To quantify parent-child conflict, a multi-method approach will be used, incorporating well-validated questionnaires for both parent and child, in addition to a semistructured interview (the UCLA Life Stress Interview; (Adrian & Hammen, 1993) that is administered individually to the primary caregiver and target child from each family. These measures were included in the present study in an attempt to clarify the relationship between parent-child conflict, the family environment, and physical health, with a primary emphasis on examining the predictive power of child and parent reports.

Further, developments in the field of ecological momentary assessments (EMA) have made it possible and practical to employ naturalistic observation in the research setting (Shiffman & Stone, 1998). An EMA approach can address limitations by both laboratory interactions and self-report questionnaires. Using questionnaire reports to accurately assess parental behaviors from the child and parent perspectives both include potential sources of bias and shared method variance (Mehl, Robbins, & Deters, 2012). Further, using short laboratory interactions to assess parental behaviors raises questions regarding the generalizability and

validity of these interactions, as research has long documented changes in parental behaviors due to context (Belsky, 1980). The Electronically Activated Recorder (EAR; (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) is a relatively new naturalistic observation method used to capture important interactions as they occur in daily life. The EAR unobtrusively takes brief recordings of ambient sounds and everyday occurrences of a participant's environment. Participants wear the EAR as they go about their daily routines and interactions, keeping an acoustic log of their days and behaviors as they progress. Previous research with the EAR suggests good psychometric properties such that adequate test-retest reliability has been demonstrated and that the sampling patterns utilized by the EAR are generalizable to an individual's daily behavior (Mehl, et al., 2012). Further, in implementing a specific coding manual using carefully defined behaviors to evaluate the presence or absence of a particular behavior with a training set of EAR recordings, high inter-rater reliability can be established (Mehl, et al., 2012; Pennebaker, Mehl, & Niederhoffer, 2003).

The EAR has been used in multiple adult and family studies in a variety of contexts. In the adult literature, the associations between daily behaviors and a variety of psychological constructs have been explored including depressive symptoms (Mehl, 2006), personality (Mehl, Gosling, & Pennebaker, 2006), and happiness (Mehl, Vazire, Holleran, & Clark, 2010). Work with the EAR also extends to medical populations. In a sample of participants diagnosed with rheumatoid arthritis, EAR-assessed sighing was significantly related to reported levels of depressive symptoms but not with self-reported pain (Robbins, Mehl, Holleran, & Kasle, 2011). Additionally, EAR-assessed swearing in the presence of others was linked to increased self-reported depressive symptoms and decreased self-reported emotional support in a sample of

women experiencing a chronic illness (Robbins et al., 2011). In short, various EAR-assessed daily behaviors have been linked to psychological processes in the adult samples.

In the family literature, parental negative emotionality (Slatcher & Trentacosta, 2012) and parental depressive symptoms (Slatcher & Trentacosta, 2011) have been linked with increased problem behaviors in young children. Additionally, increased conflict in the home of young children (aged 3-5) was associated with an altered diurnal cortisol profile, including flatter (less "healthy") cortisol slopes and lowered waking cortisol levels, whereas maternal reports of daily parent-child conflict were unrelated to diurnal cortisol patterns (Slatcher & Robles, 2012). To the author's knowledge, no studies to date have addressed how naturalistically-observed everyday family interactions impact youth health. This study addresses that gap by using the EAR to naturalistically assess the effects of conflict in the home on important health outcomes among youth with asthma.

Asthma Morbidity Measures

Particularly important markers of asthma morbidity are pulmonary functioning and utilization of health care services, including asthma clinic visits and emergency department visits. These markers of asthma morbidity can be used to assess the ways in which pediatric asthma is affected by conflict in parent-child relationships.

Measures of pulmonary function are frequently used to provide objective information about asthma morbidity and can include pulmonary function tests (PFTs) or peak expiratory flow rates (PEFRs) (Garro & Klein, 2008). This study will utilize PFTs as the primary measure of objective asthma morbidity. PFTs measure the degree to which an individual's airway is obstructed, while taking age into account (Enright, Lebowitz, & Cockroft, 1994). Many studies have examined forced expiratory volume in 1 second (FEV_1), a measure from PFTs, to indicate

the degree of airway obstruction expressed as a percentage taking age, gender, ethnicity, and height into account (Wang, Dockery, Wypij, Fay, & Ferris, 1993). FEV_1 is the most reliable reproducible pulmonary function measure and low FEV_1 values have been widely associated with risk for asthma exacerbations (Enright, et al., 1994; Garro & Klein, 2008) In addition to FEV_1, research evidence has indicated that the ratio of FEV_1 to forced vital capacity (FEV_1/FVC) is a more accurate marker of asthma severity impairment as it accounts for each child or adolescent's total amount of air that can be expired after maximum inspiration (Bacharier et al., 2004; Garro & Klein, 2008; Paull, Covar, Jain, Gelfand, & Spahn, 2005). Both FEV_1 and FEV_1/FVC will be used as markers of asthma morbidity in the present study.

Previous research has also employed healthcare utilization as a measure of asthma morbidity, more specifically the number of emergency department visits for asthma-related care (Kaugars, et al., 2004; Shalowitz, et al., 2001; Wasilewski et al., 1996). Utilization of health care services provides a measure of the direct burden of asthma on the target child and family (Garro & Klein, 2008). Further, frequency of hospitalizations and unscheduled medical visits provide a marker of risk for future hospitalization and severe asthma attacks. Many factors have been associated with frequent emergency department visits, including greater number of asthma symptoms, higher number of prescription medications, prior hospitalizations, and low parental confidence in medication efficacy (Kaugars, et al., 2004; Shalowitz, et al., 2001; Wasilewski, et al., 1996). The current study will utilize participants' number of medical record-documented emergency department visits in the previous 6-months prior to their baseline assessment as a measure of asthma morbidity and health care utilization. Further, less frequent scheduled asthma appointments is associated with poor quality asthma care and management (Reeves, Bohm, Korzeniewski, & Brown, 2006). Thus, the number of medical record-documented asthma clinic

visits 6-month prior to the baseline assessment will also be used as a measure of asthma morbidity, with more frequent clinic visits considered a marker of better asthma management. By using these two measures, the present study will investigate the impact of the parent-child relationship on clinically significant markers of asthma morbidity.

A majority of the research to date on family processes and childhood asthma has used parent reports to measure asthma morbidity (Chinn & Rona, 2001; Ford, 2005; Gilliland et al., 2003; Gold, Damokosh, Docerky, & Berkey, 2003). Research has demonstrated that parents of children with asthma consistently overestimate their children's adherence to medication and their degree of control, with 40% of parents surveyed indicating good control of asthma symptoms, even when their child utilizes a rescue inhaler as their primary daily control medication (Dozier, Aligne, & Schlabacher, 2006; Winter, Spagnola, Fiese, & Anbar, 2011). Parental reports of asthma symptoms are poor predictors of youth symptoms and illness threat when compared to objective measures of pulmonary function (i.e. spirometry) and are not adequate measures of asthma control in children (Winter, et al., 2011). Recently, there has been a call to obtain a more full picture of symptom expression and functioning from both the child and parent, as the child can provide valuable information on their own perception of their symptom expression and daily functioning (Winter, et al., 2011). In order to get a more complete view of childhood asthma, the current study incorporates questionnaire measures from the youth participant, objective measures of pulmonary functioning, and medical record data. By using this multi-method approach, we seek to gain a much clearer picture of the associations between youth asthma and the parent-child relationships. Primary aims of this study will be to examine the associations between measures of parent-child conflict and stressful events experienced by the parent and child and measures of asthma morbidity.

Peer Relationships: A Potential Moderator

Much like family relationships, peer relationships play an important role in development, being a potential source of both support and stress (La Greca, 1992; Zbikowski & Cohen, 1998). Previous research with children and adolescents has focused on the relationship between support and health, but the majority of the research focuses on parental support, not peer support (Shalowitz et al., 2006). The quality of peer relationships can provide additional insight with regard to the association between parent-child conflict and physical health. For example, it is possible that children with high quality peer relationships may be partially protected against the negative health impact of parent-child conflict. This section will summarize the current research on the influence of peer relationships on child health, first discussing peer impact on overall health, and then specifically discussing links with asthma. Additionally, this section will attempt to illuminate gaps in the literature, which the current study will aim to resolve.

Peer relationships have long been a topic of research with respect to health and well-being. Previous research has indicated that peer relationships are an important source of support for adolescents with a variety of chronic medical conditions. For example, peer support has been associated with both greater medication adherence and metabolic control in adolescents with diabetes (La Greca et al., 1995; Skinner, White, Johnston, & Hixenbaug, 1999). Peer support has also predicted better psychological adjustment for adolescents experiencing diabetes and family support predicted adjustment for children with diabetes (Varni, Babani, Wallander, Roe, & Frasier, 1989). Increased peer support for children with acquired and congenital limb deficiencies, specifically in the classroom, is associated with better adjustment (lower depressive symptoms, lower anxiety symptoms, and higher self-esteem, Varni, Setoguchi, Rappaport, & Talbot, 1992). Peer affiliations and high quality friendships are protective against feelings of

anxiety whereas peer victimization and low quality friendships are predictive of high amounts of social anxiety (La Greca & Harrison, 2005). Considering these diverse benefits of high-quality peer relationships, it is possible that peers may provide a buffer from the negative effects of parent-child conflict. In one study investigating the moderating relationship of friendship on the links between harsh family environments and peer victimization, it was demonstrated that harsh family environments predicted victimization by peers for children who had a low number of friendships but not those with a high number of friendships (Schwartz, Pettit, Dodge, & Bates, 2000). Largely, peer relationships have shown to predict health status and health behaviors, with positive peer networks having protective effects and negative peer relationships having adverse health and psychosocial consequences.

Relatively few studies have investigated the association between peer relationships and asthma. In a secondary analysis of a study with children with moderate asthma, social support was shown to be a strong predictor of behavioral problems, but unrelated to disease variables (Bender, et al., 2000). Additionally, a recent study investigated the influence of peer interactions in shaping emotional experiences related to asthma, indicating that adolescent females with asthma are more likely than their male counterparts to discuss their worries regarding asthma with friends; additionally, children with asthma are more likely to confide in their peers about teasing (Petteway, Valerio, & Patel, 2011). These preliminary findings suggest that peer support is an important factor for children and adolescents with asthma. Although the study did not investigate the relationship between peer relationships and health outcomes, it did reveal that children and adolescents with asthma confide in their peers about their asthma struggles and other sources of conflict in their lives. This study illuminates the need to examine how peer relationships may impact asthma-related health outcomes and potentially buffer the links

between parent-child conflict and physical health. Thus, a final aim of this study is to examine the potential of child peer relationships to moderate the association between parent-child conflict and asthma morbidity.

Study Overview

The overall objectives of the current study are to clarify the links between parent-child conflict, stressful events experienced by youth and primary caregivers, and physical health among children with asthma (aged 10-17). By including children aged 10 to 17, the study will encompass the significant transitions in late childhood and adolescence that are characterized by changes in family relationships and processes that may impact asthma morbidity (Graber, Brooks-Gunn, & Petersen, 1996; Lerner, 2002; Poulin & Heckhausen, 2007). The study aims to determine if children with asthma in high conflict relationships with a caregiver and more stressful experiences have greater asthma morbidity and complicating health problems (e.g., obesity). Additionally, the study aims to determine which method of assessing conflict at home (e.g., self-report, interviews, or EAR) is more strongly associated with physical health outcomes. Further, the study aims to examine if the perception of high quality peer relationships by children with asthma moderates the association between parent-child conflict, stressful experiences, and asthma morbidity. In light of the published literature, the following hypotheses were tested:

1. Both interview and self-reported measures of parent and child reported parent-child conflict will be positively associated with markers of asthma morbidity and complicating health problems, including pulmonary function (FEV_1 and FEV_1/FVC), emergency department visits, self-reported asthma symptoms, and body mass index, and negatively associated with asthma clinic visits. When parent-child conflict is high, children are expected to have greater asthma morbidity, as evidenced by decreased pulmonary

function (FEV_1 and FEV_1/FVC), fewer clinic visits, greater emergency department visits, greater self-reported asthma symptoms, and greater body mass index (H1).

2. Looking at family conflict from both parent and child perspectives, as well as through naturalistic observation methods (EAR), the current study will evaluate the utility of each method in predicting asthma outcomes. It is hypothesized that the EAR-observed conflict will also be positively associated with negative health outcomes when compared to self-report and interview methods (H2).
3. Parent-child conflict will be a stronger predictor of negative physical health outcomes than overall family functioning and general family environment conflict such that parent-child conflict as assessed via questionnaire, interview, and the EAR methods will explain a significant amount of unique variance in predicting negative asthma health outcomes, above and beyond overall family functioning, as measured by the APGAR (a questionnaire measure of family functioning) and general family environment conflict on the EAR (H3).
4. A greater number of reported stressful events as experienced by the parent or participating child will be significantly associated with markers of asthma morbidity and complicating health problems, including decreased pulmonary function (FEV_1 and FEV_1/FVC) and clinic visits, and increased emergency department visits, self-reported asthma symptoms, and body mass index. When the number of reported stressful events is high with the parent or child, children are expected to have greater asthma morbidity and complicating health problems, as evidenced by decreased pulmonary function (FEV_1 and FEV_1/FVC), fewer clinic visits, greater emergency department visits, greater self-reported asthma symptoms, and greater body mass index (H4).

5. Child peer relationships will moderate the association between parent-child conflict and asthma morbidity. That is, the degree to which parent-child conflict and asthma morbidity are related will depend on the quality of peer relationships of the target child. A non-significant relationship between parent-child conflict and asthma morbidity is expected for those with high quality peer relationships, whereas a significant relationship is expected for those with low quality peer relationships. The perception of positive peer relationships is proposed to buffer the effects of negative parent-child conflict on markers of asthma morbidity (H5).

CHAPTER 2

METHOD

Participants

A total of 81 youths aged 10 to 17 and primary caregivers took part in the study as part of a larger study investigating the effect of risky family environments on child health, the Asthma in the Lives of Families Today (ALOFT) Study. The sample consisted of 38 girls (*M* age = 12.97, *SD* = 1.94) and 43 boys (*M* age = 12.79, *SD* = 1.78) and included 15 youths with mild intermittent asthma, 13 youths with mild persistent asthma, 34 youths with moderate persistent asthma, eight youths with severe asthma, and seven youths with unknown asthma diagnosis severity. Age of the primary caregivers (80 females, 1 male) ranged from 31 to 76 with an average of 41.9 years (*SD* = 7.74). Annual household income ranged from the $0 – $7,825 tax bracket to the $97,926 - $174,850 tax bracket, with a median range of $7,826 - $31,850. Of the primary caregivers, 57 identified themselves as African American or Black, 20 as White, three as Hispanic, and one as Asian. Thirty-five primary caregivers indicated that they were never married, 30 were currently married or living in a marriage-like relationship, nine were divorced, five were separated, and two were widowed. The average relationship duration for couples who reported being married or in a marriage-like relationship was 16.27 years (*SD* = 7.27).

Procedures

Participants were recruited through the Allergy, Immunology, and Rheumatology Clinic at Children's Hospital of Michigan, local area hospitals, and with flyers distributed to Metro-Detroit Area Schools. When primary caregivers phoned the laboratory, they were informed that the purpose of the study was to better understand how family processes affect asthma. Eligibility was determined over the phone. Families were eligible for the study if their child was between

the ages of 10 and 17 with a diagnosis of mild intermittent to severe asthma. Written assent and consent were obtained from the participating youth and their parent(s), respectively. The participating youth and their primary caregiver visited the laboratory at Wayne State University for their first visit where they completed a number of computer questionnaires and individual interviews. They then completed four days of daily diaries, including information on their sleep quality and daily interactions, saliva collection, and wore the EAR on each of those days (detailed information about the EAR is provided below). Then they returned to Children's Hospital of Michigan where they underwent a peripheral blood draw, pulmonary function tests, and completed an additional interview. The participants will complete follow-up visits at one and two years following their baseline assessment. The focus of the analyses described in this thesis will be on the baseline laboratory questionnaires, interviews, EAR data, and the medical records collected at baseline. Participants were reimbursed for their time, up to $330 cash for primary caregivers and $210 in gift cards for youth participants for completion of the study in its entirety. The study was approved by the Institutional Review Board at Wayne State University.

Measures

Parental Environment Questionnaire (PEQ) (Miller & Hauser, 1989). To assess the participants' perceptions of the parent-child relationship, the PEQ was administered to the participating child and their primary caregiver. This scale has been well-validated in family samples, including with children and adolescents (Burt, Krueger, McGue, & Iacono, 2003; Elkins, McGue, & Iacono, 1997). The child and primary caregiver rated 24 items assessing the parent-child conflict and parental involvement aspects of their relationships on a 4-point scale (1 = *definitely false*, 4 = *definitely true*). Only the conflict subscale was examined. Cronbach's alpha for the current child and primary caregiver samples was .89 and .88, respectively. Mean

conflict subscales scores based of child reports was 1.65 (*SD* = .61) and based off parent reports was 1.6 (*SD* = .52).

Family APGAR (APGAR) (Smilkstein, 1978). The Family APGAR was used to assess the child's perception of overall family functioning. The measure includes 5 items assessing family adaptability, partnership, growth, affection and resolve. Items are rated on a 3-point scale ranging from 0 (*hardly ever*) to 2 (*almost always*) and then summed to create a total score. Higher scores indicate greater degrees of satisfaction within the family unit. Scores lower than 6 suggest family dysfunction. Cronbach's alpha for the current sample was .82. The mean APGAR score for the sample was 6.93 (*SD* = 2.59).

UCLA Life Stress Interview (LSI) (Adrian & Hammen, 1993; Hammen, 1991). To assess participants' exposure to stressful events, the UCLA Life Stress Interview was administered separately to the participating child and their primary caregiver. Previous work has validated this measure in youth samples as young as 8-years-old (Chen, Fisher, Bacharier, & Strunk, 2003; Hammen & Brennan, 2001; Miller & Chen, 2006; Rudolph & Hammen, 2003). The semistructured interview covers exposure to both chronic stress and acutely stressful events that have occurred over the past 6 months. The interview focuses on family relationships (including parents and siblings), peer relations, school, home life, and family health. Family relationship categories assess both closeness and conflict separately. In each domain, a trained interviewer asks a series of open-ended questions and uses the information to rate the extent of chronic stress on a 5-point scale (1 = *superior functioning*, 5 = *severe persistent difficulties*), with higher numbers reflecting more severe, persistent difficulties based on behavior-specific anchor points. Reliabilities for chronic stress ratings were based on independent judges' ratings of audiotaped interviews (*n* = 34). Intraclass correlations across all domains ranged from 0.73 -

0.98 (*M* = 0.86) for the primary caregiver interviews and from 0.71 – 1.00 (*M* = 0.84) for the child interviews.

The parent-child conflict domain was used as measure of chronic parent-child conflict in the analyses with lower scores indicating superior functioning (e.g., minor or no conflict and superior conflict resolution) and higher scores indicating severe persistent difficulties (e.g., constant conflict, complete lack of conflict resolution, openly expressed anger or aggression). The mean for the parent and child conflict domain scores for this sample were 2.52 (*SD* = .78) and 2.43 (*SD* = .95), respectively.

The peer relationship domain of the LSI was used as the measure for child peer relationships in the analyses with lower scores indicating superior functioning (e.g., multiple close friendships, engagement in frequent social activities outside of school) and higher scores indicating severe persistent social problems (e.g., social isolation, peer rejection, and/or frequent peer conflict). The mean scores for child peer-relationships based off of child and parent reports were 2.51 (*SD* = .78) and 2.60 (*SD* = .83), respectively.

This interview also collects information regarding the number of acutely stressful events experienced in the past 6 months from the participating parent and child. In this interview, acutely stressful events are defined as specific events with a distinct onset and end. Participants are asked how the event impacted their life on a 1-5 scale (1 = *none*, 5 = *a great deal*). In this study, the raw number of reported acutely stressful life events was used as a measure of acute life stress in the family context. The mean number of stressful experiences reported for the parent was 3.11 (*SD* = 1.73) and for the participating child was 1.9 (*SD* = 1.47).

Electronically Activated Recorder (EAR). In order to assess parent-child conflict during daily interactions and specific behaviors associated with conflict (i.e. yelling), each

child/adolescent wore the EAR (Mehl, et al., 2001) as they went about their daily lives. This study utilized two versions of the EAR. The first version used in this study (HP iPAQ 110) is 4.59 x 2.71 x .54 inches and weights 4.08 ounces. The second version (and newest available version of the EAR) used in this study (Apple iPod touch, 8GB) is 4.4 x 2.3 x 0.28 inches and weights 3.56 ounces. Following the laboratory session, the EAR was worn for 4 days, beginning on a Thursday morning and ending on a Sunday evening or beginning on a Saturday morning and ending on a Tuesday evening in order to capture two weekdays and two weekend days. Participants were asked to wear the EAR continuously from the time the youth woke up until bedtime. Recordings capture 50 seconds of sound every 9 minutes.

Of the 81 participants, 54 returned the EARs with a sufficient set of files to code. Of these 54 sets of files, 45 are coded and included in the analyses; nine participants' files still need to be coded. These 45 sets of files included 34 primary caregivers who reported being in a relationship, 22 of which were currently married or living in a marriage-like relationship. Of the 27 EARs that did not have a sufficient number of files, eighteen were returned to the lab with no files due to a program malfunction or battery dying, six were returned with an insufficient number of codeable files (fewer than 30 valid talking files), one EAR was dropped in the toilet, one EAR was stolen, and one EAR was destroyed in a house fire. Participants had an average of 230.24 (*SD* = 86.17) valid waking audio files and an average of 92.36 (*SD* = 39.81) valid talking files. Participants with codeable EAR data were compared to those who did not have a sufficient number of files to code. These analyses indicated that these groups did not differ on annual household income, parental relationship status, youth age, or youth gender.

EAR data was coded using the Everyday Child Home Observation (ECHO; Slatcher & Tobin, 2012), which is a coding system specifying the youth's current location, activity, mood,

and behaviors specific to parent-child interactions. Inter-coder reliability was determined by a set of training recordings (512 50-sec recordings) independently coded by the 12 research assistants who transcribed and coded these data. Intraclass correlations based on a two-way random effects model were calculated for each coded behavior. Scores for each EAR-observed behavior reflect the percentage of total recordings that the behavior was observed during waking hours.

Table 2 presents the inter-rater reliability coefficients, means, and standard deviations of the EAR variables used in analyses. Codes to assess conflict within the parent-child relationship include yelling by the mother, yelling by the father, yelling by the participating child, and conflict between the parent and child. Conflict in this coding scheme was defined as an interpersonal argument, conflict or fight between the target child and their guardian. Given the low base rates of the conflict and yelling found in the EAR files, two composite measures were computed. Composite measures were computed by summing the individual EAR-observed behaviors. The first composite captures parent-child related conflict, including coded conflict between mother and participating child, conflict between father and participating child, and yelling by the caregivers and child. For the parent-child conflict composite, the mean was 1.91% (*SD* = 2.32, range: 0% - 10%). Cronbach's alpha for this composite measure was .40. The second composite captures the total family environment related conflict, which includes parent-child related conflict, any added conflict within the family environment experienced by the child (including conflict with peers and siblings and conflict between other family members, e.g., between a parent and another child in the family), and yelling by the caregivers and child. For the family-related conflict composite, the mean was 3.88% (*SD* = 4.21, range: 0% -19%). Cronbach's alpha for this composite measure was .29. Additionally, the coughing and wheeze

codes were used from this manual to have an EAR-observed measure of asthma symptoms in the analyses.

Pulmonary Function Tests (PFTs**).** PFTs were used to provide objective information about asthma morbidity. PFTs provide a measure of an individual's degree of airway obstruction at a single point in time (Garro & Klein, 2008). Pulmonary function was evaluated through spirometry using a KoKo Spirometer® according to the guidelines provided by the American Thoracic Society (American Thoracic Society, 1995). FEV_1 was derived and calculated as a percentage of predicted values accounting for age, sex, ethnicity, and height (Wang, et al., 1993). The mean FEV_1 for the sample was 87.54 (*SD* = 18.61). FEV_1/FEC was derived and calculated as a percentage of values accounting for age, sex, ethnicity, and height. The mean FEV_1/FEC for the current sample was 91.02 (*SD* = 14.75).

Anthropometric Measurements. Height and weight were measured at Children's Hospital of Michigan by a registered nurse. Height and weight measurements were made using a balance beam scale and sliding L-shaped arm in accordance with standard clinical techniques. BMI was calculated as the weight measured in kilograms divided by the square of the height in meters. The international consensus is that a BMI > 95^{th} percentile is a valid and clinically useful definition of obesity (Belamarich et al., 2000; Naber et al., 2007). The mean BMI for the sample was 23.47 (*SD* = 6.01). 12.34% of the sample had a BMI above 30.

Measures of Health Care Utilization. The measures of health care utilization include Asthma Clinic visits within the past six months (*M* = 1, *SD* = 1.02), and Emergency department visits for asthma within the past six months (*M* = 0.8, *SD* = .89). Physician-documented severity of asthma diagnosis, asthma clinic visits, and emergency department visits were obtained from the medical records of the target children by written authorization of their guardians.

Self-Reported Asthma Symptoms. Questions assessing the severity of asthma symptoms were given at the baseline assessment. These questions have been validated in an interview format for youth with asthma (Chen, et al., 2007). Questions included a rating of the severity of wheezing, chest pain, chest tightness, and any shortness of breath or difficulty breathing felt by the target child in the past two weeks as reported by the target child (0 = *none;* 4 = *severe)*. The sum for this scale was 8.21 (*SD* = 3.25). Cronbach's alpha for the current sample was .79. Additionally, participants were asked the number of days in the past two weeks in which they experienced any asthma symptoms; this included wheezing, shortness of breath, coughing, and tightness in their chest. The sum for this scale was 8.35 (*SD* = .96). Cronbach's alpha for the sample was .83. One item was removed from this scale in the analysis due to low reliability. This item pertained to the number of nights awakened due to asthma symptoms.

CHAPTER 3

RESULTS

Prior to conducting analyses, data were screened fro accuracy of input, nonrandom missing data, and univariate and multivariate outliers. The Statistical Package for Social Sciences (SPSS) Version 19 software was used to conduct analyses. One youth was found to have one large univariate outlier on EAR-observed Wheezing (z = 5.50). Due to the small sample size instead of removing the participant, their score was truncated to the next greatest EAR-observed Wheezing score (z = 2.07). One youth was found to have one large univariate outlier on the Asthma Symptoms Reported in the Past 2 Weeks (z = 4.93). This youth's score was truncated to the next greatest Asthma Symptoms Reported in the Past 2 Weeks (z = 2.71).

Table 3 presents the bivariate correlations between the parent and youth predictor variables. There was modest concordance between parent- and youth-reported conflict as assessed by the Life-Stress Interview and the PEQ-Conflict subscale. Before conducting analyses, the effects of age and gender were examined. Youth age was significantly associated with youth-reported conflict scores on the LSI. Further, there was a significant relationship between youth gender and youth-reported conflict on the LSI, APGAR, and the number of acutely stressful events experienced in the prior six months. Additionally, parent age was significantly associated with parent-reported conflict on the LSI. Table 4 displays the bivariate correlations between all outcome variables. Notably, very few of the outcome variables were significantly correlated. FEV1 was positively correlated with FEV1/FVC (r = .66), but negatively correlated with Asthma Severity in the past two weeks (r = -.24). Asthma symptoms in past two weeks were significantly correlated with asthma severity in the past two weeks (r = .57). EAR-observed wheezing was also significantly correlated with EAR-observed coughing (r

= .43). Notably, annual household income was not associated with any predictor or outcome variables.

Conflict and Asthma Outcomes

In order to test the hypothesis that parent and child reported parent-child conflict would be positively associated with markers of asthma morbidity and complicating health problems, bivariate correlations were examined (H1). In general, this hypothesis was not supported.

Table 5 presents correlations between predictor and outcome variables. Youth-reported conflict as measured by the LSI was significantly positively related to FEV1, an indicator of pulmonary functioning ($r = .26$, $p < 0.05$). However, this relationship is in the opposite direction of what was hypothesized. Gender was related to this relationship, such that female participants reported more conflict in their relationship with their primary caregiver than male participants. Additionally, there was a significant relationship between child-reported conflict on the LSI and FEV1 ($r = .31$, $p < .05$) for children aged 10-12 but not 13-17. When controlling for youth age, the relationship between youth reported conflict on the LSI and FEV1 remained significant ($r = .24$, $p < .05$).

Although a significant relationship was not found between child-reported conflict on the LSI and FEV1/FVC when using the whole sample, a positive relationship was found between youth reported parent-child conflict on the LSI and FEV1/FVC among female youth in the study ($r = .43$, $p < .05$). This relationship was also in the opposite direction from what was hypothesized. There were no significant relationships between male LSI conflict scores and asthma outcomes. There were no additional significant relationships between child-reported conflict scores and asthma outcomes.

When controlling for youth age, there was a significant relationship between parent-reported conflict on the PEQ and youth-reported severity of asthma symptoms (r =-.27, $p < .05$). There were no additional significant relationships between parent-reported conflict variables and asthma outcomes.

EAR-observed Conflict and Asthma Outcomes

To test the hypothesis that EAR-observed conflict would predict negative health outcomes, bivariate correlations between EAR-observed conflict codes and asthma outcome measures were examined (H2). In general this hypothesis was supported; participants with higher EAR-observed conflict had greater asthma morbidity.

Table 6 displays the relationships between the conflict variables observed by the EAR and the interview and self-reports. Interestingly, there were no significant relationships between traditional measures of conflict (i.e., LSI and PEQ) and the EAR conflict variables.

As displayed on Table 7, the EAR-observed conflict within the family environment composite was positively correlated with self-reported asthma symptoms in the past two weeks (r = .32, $p < .05$) and with EAR-observed wheezing (r = .34, $p < .01$). Figure 1 and Figure 2 depict these relationships, respectively. Further as displayed in Figure 3, the EAR-observed parent-child conflict composite was positively correlated with self-reported asthma symptoms in the past two weeks (r = .36, $p < .01$).

Examination of the specific codes comprising the conflict composites revealed significant relationships with certain family members. First, coded conflict within the family environment observed on the EAR was associated with increased Emergency Department visits in the past six months (r = .32, $p < .05$) and EAR-observed wheezing (r = .35, $p < .05$). Greater conflict with mothers was marginally linked to greater self-reported asthma symptoms in the past two weeks

(r = .28, p < .10) whereas greater conflict with fathers was associated with EAR-observed wheezing (r = .43, p < .01). EAR-observed yelling from the participating child was strongly positively linked with self-reported asthma symptoms in the previous two weeks (r = .42, p < .01).

As displayed on Table 8, these relationships largely remained significant when controlling for youth age. The EAR-observed conflict within the family environment composite was positively correlated with self-reported asthma symptoms in the past two weeks (r = .33, p = .05) and with EAR-observed wheezing (r = .30, p < .05). The EAR-observed parent-child conflict composite was positively correlated with self-reported asthma symptoms in the past two weeks (r = .36, p < .01).

When examining the specific EAR variables and controlling for youth age, additional relationships emerged. Greater conflict with mothers remained linked to greater self-reported asthma symptoms in the past two weeks (r = .28, p < .05) and marginally linked with EAR-observed coughing (r = .28, p = .07). Greater conflict with fathers remained associated with EAR-observed wheezing (r = .39, p < .01) but also marginally associated with FEV1 (r = .29, p = .06). EAR-observed yelling from the participating child continued to be strongly positively linked with self-reported asthma symptoms in the previous two weeks (r = .42, p < .01).

Parent-Child Conflict Predicting Health Outcomes Over Family Functioning and Conflict

To test the hypothesis that parent-child conflict would be a stronger predictor of negative physical health outcomes than overall family functioning and overall family conflict, hierarchical regression analyses were conducted and the unique variance explained by the parent-child conflict measures were examined (H3). In general, findings were limited, but consistent with this hypothesis.

Child gender and age were entered as control variables. Then multiple regressions were run with child-reported family functioning and all measures of parent-child conflict predicting physical health outcomes. As shown in Table 9, EAR-observed parent-child conflict significantly predicted child-reported asthma symptoms experienced in the past two weeks ($\beta = .39$, $p = .01$) while the APGAR score did not ($\beta = .10$, $p = .52$). The remaining analyses were not significant for self-reported parent-child conflict, EAR-observed parent-child conflict, or child-reported family functioning.

After controlling for child gender and age, multiple regressions were run with EAR-observed family environment conflict and all measures of parent-child conflict predicting physical health outcomes. As displayed in Table 10, EAR-observed parent-child conflict significantly predicted increased child-reported asthma symptoms experienced in the past two weeks ($\beta = .41$, $p < .05$) while EAR-observed conflict within the family environment did not ($\beta = .02$, $p < .91$). EAR-observed conflict within the family environment was a significant predictor of EAR-observed wheezing ($\beta = .41$, $p < .05$) whereas EAR-observed parent-child conflict was not ($\beta = -.24$, $p = .20$). In the remaining analyses, only EAR-observed conflict within the family environment remained a significant predictor of EAR-observed wheezing ($\beta = .41$, $p < .01$) when compared with the traditional measures of conflict (i.e. interview and questionnaire assessments) as displayed in Table 12.

Stressful Events and Asthma Outcomes

To test the hypothesis that a greater number of reported stressful events experienced by the parent or participating child would be positively associated with markers of asthma morbidity and complicating health problems, bivariate correlations were examined (H4). In general, results

support this hypothesis for stressful events experienced by the parent but not the participating child.

Table 5 presents the relationship between the stressful experiences variables and asthma outcomes. A greater number of parent-reported acutely stressful events experienced in the past six months was significantly associated with decreased pulmonary functioning, as evidenced by decreased FEV1 (r = -.25, p < .05) and decreased FEV1/FVC (r = -.39, p < .05). Additionally, a greater number of stressful events reported by the parent was significantly related to decreased asthma clinic visits (r = -.36, p < .05) and increased emergency department visits (r = .28, p < .05). Further, stressful events reported by the parent demonstrated a significant positive relationship with the number of asthma symptoms (r = .36, p < .01) and severity of symptoms (r = 27, p < .05) experienced in the past two weeks reported by the participating child. Finally, the number of youth-reported acutely stressful events experienced in the past six months was positively associated with youth BMI (r = .24, p < 0.05).

Peer Relations as a Moderator

To test the hypothesis that youth with high quality peer relationships would be buffered by the negative effects of parent-child conflict on physical health, the interactions between parent-child conflict and peer relations in predicting negative health outcomes in a regression model were examined (H5).

Before moderation analyses were conducted, the association between child peer relationships and the outcome variables was investigated. Poor quality peer relations as reported by the youth participant were significantly associated with more frequent visits to the ER (r = .30, p < .01) and greater BMI (r = .31, p < .05), whereas poor quality peer relations as reported by the primary caregiver was only associated with BMI (r = .27, p < .05). Interaction terms were

calculated using centered variables. Regression analyses were conducted with interaction terms to determine whether peer relationship interacted with parent-child conflict to predict asthma outcomes. No interactions were significant. Thus, this hypothesis (H5) was not supported.

CHAPTER 4

DISCUSSION

The present study used multiple assessment methods to examine the effects of parent-child conflict, conflict in the family environment, stressful events, and peer relationships on health-related outcomes among youth with asthma. The main findings of this study provide new information on the impact of daily-observed conflict within the family and the impact of stressful experiences by parents on children's physical health. This study allowed for the comparison of a new innovative methodology, the EAR, with more traditional measures employed in the research of families, interview and self-report measures in assessing family conflict.

Conflict and Asthma Outcomes

EAR-assessed conflict in the home did have meaningful associations with asthma morbidity. Strong associations were found between EAR-observed conflict within the family environment, conflict with mothers, and yelling by the participating youth with asthma symptoms experienced in the previous two weeks. Further, EAR-observed asthma symptoms were strongly associated with EAR-observed conflict measures, including conflict within the family environment, conflict with fathers, and yelling by fathers. This study provides the first clear evidence for links between naturalistically-observed conflict in the home and poorer physical health in childhood and adolescence. Additionally, this evidence reaches past the parent-child relationship, in that whether being engaged in conflict or simply being present during a fight or argument with family members and peers both influence asthma morbidity. Thus, youth who witness or are involved in arguments or fights with family members experience greater asthma symptom expression. Consistent with our hypothesis, in this sample the parent-

child conflict and family conflict measures provided by the EAR proved to be a more predictive measure of asthma outcomes than more traditional interview and self-report methods.

These relationships found with the EAR are consistent with past research regarding the impact of family relationships on youth with asthma (Chen, et al., 2007; Miller & Chen, 2010) and previous EAR research highlighting the deleterious effects family conflict on the stress-response pathways of young children (Slatcher & Robles, 2012). Further, these findings add to the literature demonstrating that daily interactions within the parent-child relationship can impact physical health and development during childhood and adolescence (Gunnlaugsson , et al., 2011; Luecken & Lemery, 2004; Shonkoff, et al., 2009).

Interestingly, more traditional measures of conflict (interview and self-reported measures) were not meaningfully associated with markers of asthma morbidity and complicating health problems. There were two significant associations between child-reported parent-child conflict and pulmonary functioning, such that greater levels of parent-child conflict were related to better pulmonary functioning. There could be several potential reasons for this. First, when further exploring these relationships, it was noted that female youth participants and older participants reported more conflict in their relationship with their primary caregiver. It is possible that younger youth are more susceptible to the deleterious effects of conflict on health. Second, it is possible that the sample size was too small to uncover meaningful relationships between the interview, self-report methods, and pulmonary function measures. Lastly, though many studies have linked emotion-evoking experiences with decreased pulmonary function and increased airway resistance (Lehrer, Feldman, Giardino, Song, & Schmaling, 2002; Ritz, Steptoe, DeWilde, & Costa, 2000), a handful of studies have demonstrated a decrease in airway resistance or no change in airway resistance when in the face of stressful or emotion-provoking

experiences (i.e., mental arithmetic, reaction time tasks) (Miklich, Rewey, Weiss, & Kolton, 1973; Steptoe & Noll, 1997). A possible explanation for this increase or no change in pulmonary function include the coping demands of the task (active vs. passive) such that active tasks, like mental arithmetic, lead to decreased airway resistance and passive tasks to increased airway resistance (Lehrer et al., 1996). Potentially, the positive relationships seen in this sample between parent-child conflict and pulmonary functioning could be explained by youth recruiting active coping strategies leading to increased pulmonary function.

Parent-Child Conflict Predicting Health Outcomes Over Family Functioning and Conflict

In the current study, EAR-assessed parent-child conflict was a strong predictor of asthma symptoms experienced in the past 2 weeks whereas child-reported family functioning and EAR-observed conflict within the family environment were not. However, EAR-observed conflict within the family environment was a stronger predictor of EAR-observed wheezing when measures of parent-child conflict were not. These findings provide more evidence for the impact of conflict on asthma morbidity. The differential impact of parent-child conflict and conflict within the family environment is puzzling and may be due to statistical issues, such as the small sample size and restriction of range. On the other hand, it is possible that parent-child conflict has a more expansive impact on multiple asthma symptoms, not limited to wheezing, whereas conflict within the family environment, which encompasses conflict not limited to the primary caregivers but also includes siblings and peers, may have a limited impact on wheezing.

Stressful Events and Asthma Outcomes

Consistent with the hypotheses, the number of acutely stressful events experienced by the parent and participating youth were associated with markers of asthma morbidity and complicating health problems. Although the number of stressful events reported by the

participating youth had a significant relationship with BMI, the number of acutely stressful events reported by the primary caregiver had a more robust relationship with asthma outcomes. A greater number of reported stressful events experienced by the parent was significantly associated with decreased pulmonary functioning, decreased maintenance care with a physician (clinic visits), increased emergency department utilization, and increased asthma symptoms and symptom severity as reported by the participating child. These results clearly highlight the impact that stressful events experienced by parents can have on health in late childhood and early adolescence.

The impact of parental stress on youth health consistent is consistent with and extends past research (Tiberg, Hallstrom, & Carlsson, 2010; Wright, Cohen, Carey, Weiss, & Gold, 2002). This study adds to the current body of literature in that it identifies the extensive impact of parental stress on asthma morbidity; not only does parental stress impact pulmonary functioning and symptom expression but it impacts health care utilization and maintenance asthma care.

Peer Relations

Results showed that poor quality peer relationships were related to greater BMI. However, peer relationships did not moderate the effects of parent-child conflict on asthma morbidity. There are several potential reasons for this. The lack of expected findings may be due to statistical issues, such as restriction of range and lack of sufficient power to detect significant interaction effects. Restriction of range could have potentially occurred because of social desirability associated with the number and quality of peer relationships or lack of insight in self-reporting on close relationships, such as those with family and peers. Alternatively, peer relations have the potential to have deleterious effects on physical health, much like health

behaviors. Previous research has demonstrated a clear relationship between peer relationships and increased risk for destructive health behaviors, such as substance use (Prinstein, Boergers, & Spirito, 2001). It is possible that poor quality peer relationships impact physical health in the same manner as health behaviors. Further research on the impact of social factors and peer relations within the context of youth asthma is needed.

Conclusions

Taken together, these findings demonstrate the impact of daily family interactions on health. The associations between parent-child interactions, conflict within the family environment, and asthma symptoms have important implications for clinical practice as well as future research. First and foremost, considering the impact of parent-child conflict and stressful events experienced by the parent on youth physical health, it appears as though these families could benefit from interventions aimed at the family, rather than the parent and child individually. Multisystemic therapy provides a viable solution as previous research has shown improvements in physical health and family functioning in adolescents with diabetes (Ellis et al., 2005; Naar-King et al., 2009) as well as overweight adolescents (Naar-King, et al., 2009). Additionally, individual parent training could be implemented in order to help parents improve the quality of their parent-child interactions.

Given the complex and multifaceted nature of asthma, future research could benefit from including the EAR with biological assessments of asthma, including the inflammatory pathways and genetic markers, to help determine mediators of these relationships. Additional research could also focus on mechanisms of change in terms of physical development and illness progression to help identify factors that cause youth with asthma age out of the illness when others do not. Further, extending studies such as this to more diverse samples incorporating

families including children with other chronic illnesses and/or psychological problems can help to identify additional targets of interventions. To generalize these findings, samples are needed with greater diversity in culture, socioeconomic status, family relationship statuses, and physical health statuses.

This study has several limitations. First, the sample size was small, with substantial statistical power (> 80%) to detect only medium to large effects (*r*'s greater than .40). Next, this study utilized correlational analyses and thus cannot establish causal claims about the directionality of the relationships explored. Also in utilizing such a wide age range of children, younger participants may have lacked the insight to report on their own behavior and the behavior of others on the more traditional measures of conflict (i.e., interview and self-reports). Additionally, there are limitations in using such an innovative method like the EAR. First, these EAR data only capture family relationships during a 4-day interval, which does not fully encapsulate the constant development of the parent-child relationship. Secondly, given the low base rates of the EAR behaviors assessed in this study, more frequent or longer sampling periods may be warranted to capture these kinds of family interactions between parents and children.

In sum, this study provides strong evidence for the importance of family interactions, specifically parent-child interactions, on the health of developing youth. The EAR is a notable strength of the study in that it provides direct measurement of daily interactions and behaviors within the family when a large percentage of studies of children and families solely rely on parent reports of child behavior or laboratory interactions. The study is first to our knowledge to show that everyday behaviors within the family context are linked to asthma morbidity. These results can help medical professionals and researchers to better understand the impact of family

interactions on health and inform intervention programs aimed at reducing the impact of risky family environments on youth health.

Table 1

Sample Characteristics

Participating Youth Age (N = 81)	*M* = 12.88	*SD* = 1.85
Male	*M* = 12.79 (n = 43)	*SD* = 1.78
Female	*M* = 12.97 (n = 38)	*SD* = 1.94
Primary Caregiver Age	*M* = 41.9 years	*SD* = 7.74
Race		
African American	70.40% (*n* = 57)	
Caucasian	24.70% (*n* = 20)	
Hispanic	3.70% (*n* = 3)	
Asian	1.23% (*n* = 1)	
Asthma Diagnosis		
Mild Intermittent	18.51% (*n* = 15)	
Mild Persistent	16.05% (*n* = 13)	
Moderate Persistent	41.98% (*n* = 34)	
Severe	13.58% (*n* = 11)	
Unknown	9.88% (*n* =8)	
Annual Household Income	*Median Range* = $7, 826-$31,850	
Parent Relationship Status		
Never Married	43.21% (*n* = 35)	
Married or Marriage-Like	37.04% (*n* = 30)	
Divorced	11.11% (*n* = 9)	
Separated	6.17% (*n* = 5)	
Widowed	2.47% (*n* = 2)	

Table 2

Reliability Information and Descriptive Statistics for EAR Measures

EAR Variables	Interrater Reliability [a]	Mean (SD)
Conflict	.91	2.99% (3.59)
Conflict with Mother	.97	.91% (1.56)
Conflict with Father	.90	.12% (.40)
Conflict with Siblings	.88	.89% (1.27)
Conflict with Peers	.84	.26% (.60)
Conflict between other family members	.81	.87% (1.91)
Youth Yelling	.84	.37% (.71)
Mother Yelling	.89	.48% (.73)
Father Yelling	.92	.04% (.18)
Cough	.93	3.31% (3.76)
Wheeze	.70	.42% (1.00)

[a] Intraclass correlation (ICC [2,1])

Table 3

Bivariate Correlations between Child- and Parent-Reported Predictor and Potential Moderator Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Y-Age		-.05	.24*	.07	.02	.33**	.15	-.17	.21	-.01	-.04	-.15
2. Y-Gender			.06	-.15	.04	-.23*	-.15	.29**	-.30**	-.21	-.09	.03
3. Parent Age				-.17	.03	.03	-.26*	.16	-.08	-.19	-.02	-.05
4. Y-PEQ					.36**	.20	.50**	-.46**	.07	.09	.01	.15
5. P-PEQ						.31**	.45**	-.17	-.07	.01	.23*	.37**
6. Y-LSI Conflict							.39**	-.41**	.20	-.05	.17	.04
7. P-LSI Conflict								-.44**	.22*	.20	.22	.26*
8. APGAR									-.13	-.14	-.28*	-.13
9. Y-LSI AC										.19	.20	.01
10. P-LSI AC											-.05	.18
11. Y-LSI Peer												.46**
12. P-LSI Peer												

* $p < .05$. ** $p < .01$.

Note. Y = youth; P = parent; PEQ = Parent Environment Questionnaire; LSI = Life Stress Interview; AC = acutely stressful events experienced in the past 6 months.

Table 4

Bivariate Correlations Between Outcome Variables

	2	3	4	5	6	7	8	9
1. FEV1	.66**	.17	-.08	-.24*	-.22	.06	-.04	-.02
2. FEV1/FVC		.04	-.10	-.03	-.23	-.02	-.16	-.26
3. Clinic Visits 6 Months			-.20	-.14	-.04	-.13	-.11	-.24
4. ED Visits 6 Months				.05	.03	.13	-.08	-.06
5. Asthma Severity in the past 2 weeks					.57**	.11	.06	.06
6. Asthma Symptoms in the past 2 weeks						.01	.27ᵀ	.15
7. BMI							-.05	.15
8. EAR: Wheeze								.43**
9. EAR: Cough								

ᵀ$p < .10$. * $p < .05$. ** $p < .01$.

Table 5

Bivariate Correlations between Participant Reported Predictor and Outcome Variables

	FEV1	FEV1/FVC	Clinic Visits	ED Visits	Asthma Severity Past 2 Weeks	Asthma Symptoms Past 2 Weeks	BMI	EAR: Wheeze	EAR: Cough
Y-PEQ	-.11	-.02	-.09	-.10	.14	-.02	.07	-.18	-.21
P-PEQ	.09	-.03	-.01	-.14	-.17	-.14	.03	-.08	-.08
Y-LSI Conflict	.26*	.22	.03	-.17	-.13	-.01	.21	-.07	-.15
P-LSI Conflict	-.14	-.05	-.09	-.17	.14	.01	.15	-.16	-.16
APGAR	.01	-.03	.09	.10	-.08	.11	-.23	.14	.17
Y-LSI AC	.05	.06	.09	.01	.13	.09	.24*	-.02	-.15
P-LSI AC	-.25*	-.29*	-.36**	.28*	.27*	.36**	.24*	.15	.06
Y-LSI Peer	.15	.02	-.11	.30**	.10	-.01	.31*	.05	.25
P-LSI Peer	.12	.04	.22	.01	.13	.04	.27*	.17	.13

$^{T}p < .10$. * $p < .05$. ** $p < .01$.

Note. Y = youth; P = parent; PEQ = Parent Environment Questionnaire; LSI = Life Stress Interview; AC = acutely stressful events experienced in the past 6 months.

Table 6

Bivariate Correlations between EAR Variables and Child- and Parent-Reported Predictors and Potential Moderator

EAR Variable	Y-Age	Y-Gender	P-Age	Y-PEQ	P-PEQ	Y-LSI Conflict	P-LSI Conflict	APGAR	Y-LSI AC	P-LSI AC	Y-LSI Peer	P-LSI Peer
Conflict	-.32*	-.05	-.13	-.25	-.09	-.12	-.18	.18	-.08	.18	.17	.09
Conflict-Mother	-.04	-.10	.05	-.15	.07	.15	-.06	.21	.02	-.14	-.02	-.17
Conflict-Father	-.33*	.02	.04	-.10	.24	-.09	-.19	.05	-.09	-.11	.05	.18
Mother-Yelling	.18	.14	-.28	.17	.02	-.01	.06	.21	.15	.09	-.02	.02
Father-Yelling	-.21	-.21	-.07	.04	.15	-.07	-.20	.02	-.21	.01	-.10	-.08
Youth-Yelling	-.05	-.15	-.11	.08	.05	-.14	.01	.17	.26	-.08	-.22	-.12
Parent-Child Conflict Composite	-.06	-.08	-.09	-.04	.12	.03	-.06	.27	.11	-.11	-.09	-.12
Family Environment Conflict Composite	-.26	-.06	-.18	-.17	-.06	-.13	-.15	.19	-.01	.16	.10	.06

* $p < .05$.

Note. Y = youth; P = parent; PEQ = Parent Environment Questionnaire; LSI = Life Stress Interview; AC = acutely stressful events experienced in the past 6 months.

Table 7

Bivariate Correlations between EAR-variables and Outcome Variables

EAR Variable	FEV1	FEV1/FVC	Clinic Visits	ED Visits	Asthma Severity Past 2 Weeks	Asthma Symptoms Past 2 Weeks	BMI	EAR: Wheeze	EAR: Cough
Conflict	.15	-.06	-.05	.32*	.15	.26	.10	.35*	.24
Conflict Mother	.18	.00	-.08	-.09	.19	.28†	.06	.05	.27
Conflict Father	.21	-.03	-.02	-.08	-.17	-.05	-.15	.43**	.20
Mother Yelling	.10	.07	-.01	.14	.03	.16	-.12	.08	-.08
Father Yelling	.05	-.17	.07	-.11	-.05	.08	-.13	.19	.14
Youth Yelling	-.03	-.03	-.14	-.17	.21	.42**	-.16	.14	.08
Parent-Child Conflict Composite	.18	-.01	-.05	-.08	.17	.36*	-.08	.18	.23
Family Environment Conflict Composite	.13	-.05	-.03	.28	.16	.32*	.03	.34*	.21

†$p < .10$. * $p < .05$. ** $p < 0.01$.

Table 8

Partial Correlations between EAR-variables and Outcome Variables Controlling for Youth Age

EAR Variable	FEV1	FEV1/FVC	Clinic Visits	ED Visits	Asthma Severity Past 2 Weeks	Asthma Symptoms Past 2 Weeks	BMI	EAR: Wheeze	EAR: Cough
Conflict	.22	.10	-.03	.27†	.12	.26	.12	.30`	.17
Conflict Mother	.20	.02	-.08	-.11	.19	.28`	.06	-.04	.28†
Conflict Father	.29†	.14	.01	-.17	-.20	-.07	.14	.39**	.12
Mother Yelling	.07	-.01	-.02	.19	.04	.17	-.13	.12	-.04
Father Yelling	.09	-.08	-.08	.06	-.06	.07	-.12	.15	.09
Youth Yelling	-.02	-.01	.08	-.19	.21	.42``	-.16	.13	.07
Parent-Child Conflict Composite	.20	.03	-.04	-.10	.17	.36``	-.08	.18	.23
Family Environment Conflict Composite	.20	.08	-.02	.23	.15	.33*	-.05	.30`	.15

†$p < .10$. * $p < .05$. ** $p < 0.01$.

Table 9

Hierarchical Multiple Regression: Asthma Symptoms in the Past Two Weeks

Step in Model	F	df	R^2	sig.	Step 1 β	Step 1 sig.	Step 2 β	Step 2 sig.
Step 1	1.13	2,42	.05	.33				
Youth Gender					-.22	.15	-.23	.14
Youth Age					-.03	.82	-.01	.97
Step 2	3.06	4,40	.23	.03				
APGAR Total Score							.10	.52
EAR Parent-Child Conflict							**.39**	**.01**

Table 10

Hierarchical Multiple Regression: Asthma Symptoms in the Past Two Weeks

Step in Model	F	df	R^2	sig.	Step 1 β	Step 1 sig.	Step 2 β	Step 2 sig.
Step 1	1.13	2,42	.05	.33				
Youth Gender					-.22	.15	-.23	.14
Youth Age					-.03	.82	-.01	.97
Step 2	2.93	4,40	.23	.03				
EAR Family Environment Conflict							.02	.91
EAR Parent-Child Conflict							**.41**	**.03**

Table 11

Hierarchical Regression: EAR-observed Wheezing

Step in Model	F	df	R^2	sig.	Step 1 β	sig.	Step 2 β	sig.
Step 1	1.15	2,42	.05	.35				
Youth Gender					-.04	.77	-.04	.76
Youth Age					-.21	.16	-.11	.59
Step 2	2.75	4,40	.24	.02				
EAR Family Environment Conflict							**.58**	**.01**
EAR Parent-Child Conflict							-.24	.20

Table 12

Hierarchical Regressions: EAR-observed Wheezing

Step in Model	F	df	R^2	sig.	Step 1 β	sig.	Step 2 β	sig.
Step 1	1.15	2,42	.05	.35				
Youth Gender					-.05	.77	-.03	.74
Youth Age					-.21	.16	-.09	.58
Step 2	2.67	4,40	.21	.04				
EAR Family Environment Conflict							**.41**	**.01**
Y-PEQ							-.07	.67
Step 1	1.15	2,42	.05	.35				
Youth Gender					-.05	.77	-.03	.84
Youth Age					-.21	.16	-.10	.48
Step 2	2.78	4,40	.22	.04				
EAR Family Environment Conflict							**.41**	**.01**
P-PEQ							-.09	.52
Step 1	1.15	2,42	.05	.35				
Youth Gender					-.04	.77	-.04	.80
Youth Age					-.21	.16	-.10	.50
Step 2	2.67	4,40	.21	.05				
EAR Family Environment Conflict							**.41**	**.01**
Y-LSI Conflict							-.04	.81
Step 1	1.15	2,42	.05	.35				
Youth Gender					-.04	.77	-.04	.78
Youth Age					-.21	.16	-.10	.40
Step 2	2.75	4,40	.22	.04				
EAR Family Environment Conflict							**.40**	**.01**
P-LSI Conflict							-.08	.58

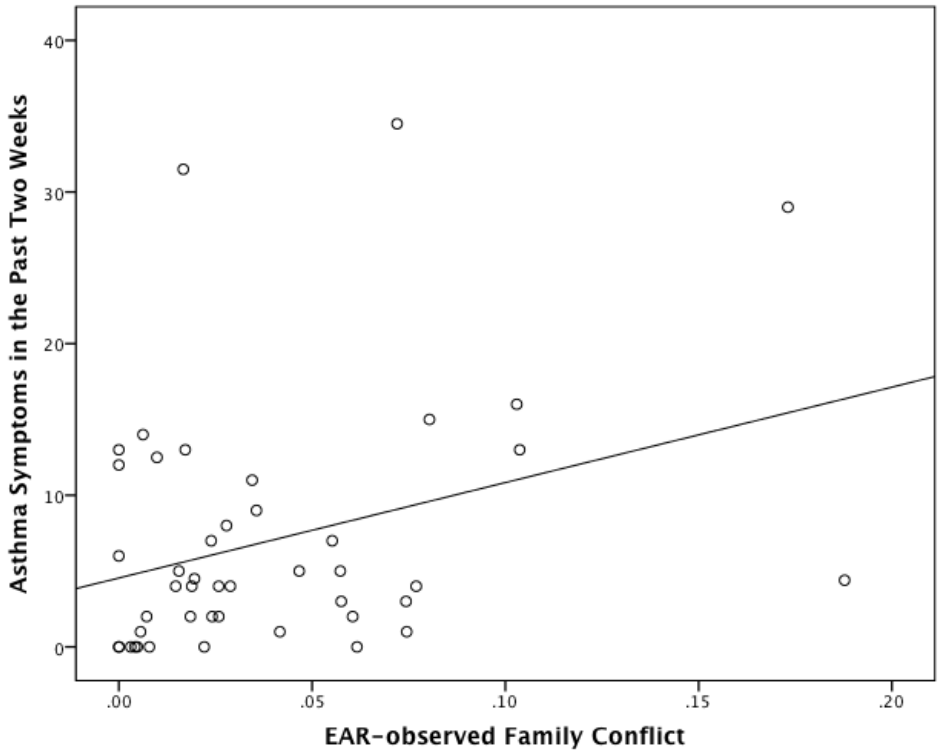

Figure 1. Scatterplot for EAR-observed Family Conflict Composite and Asthma Symptoms.

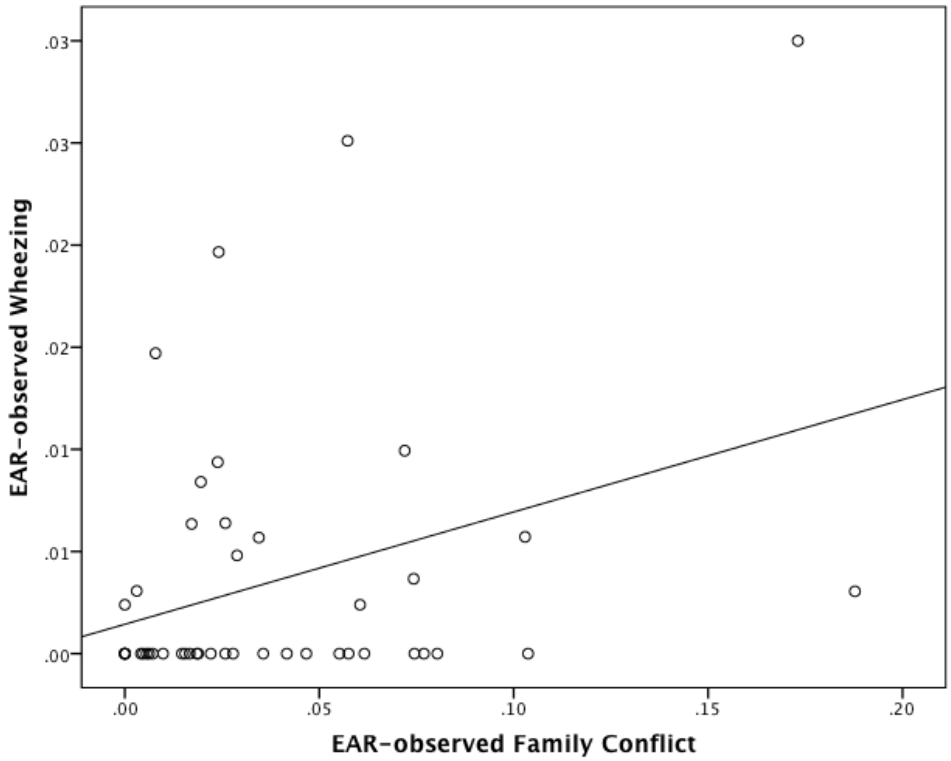

Figure 2. Scatterplot for EAR-observed Family Conflict Composite and EAR-observed Wheeze.

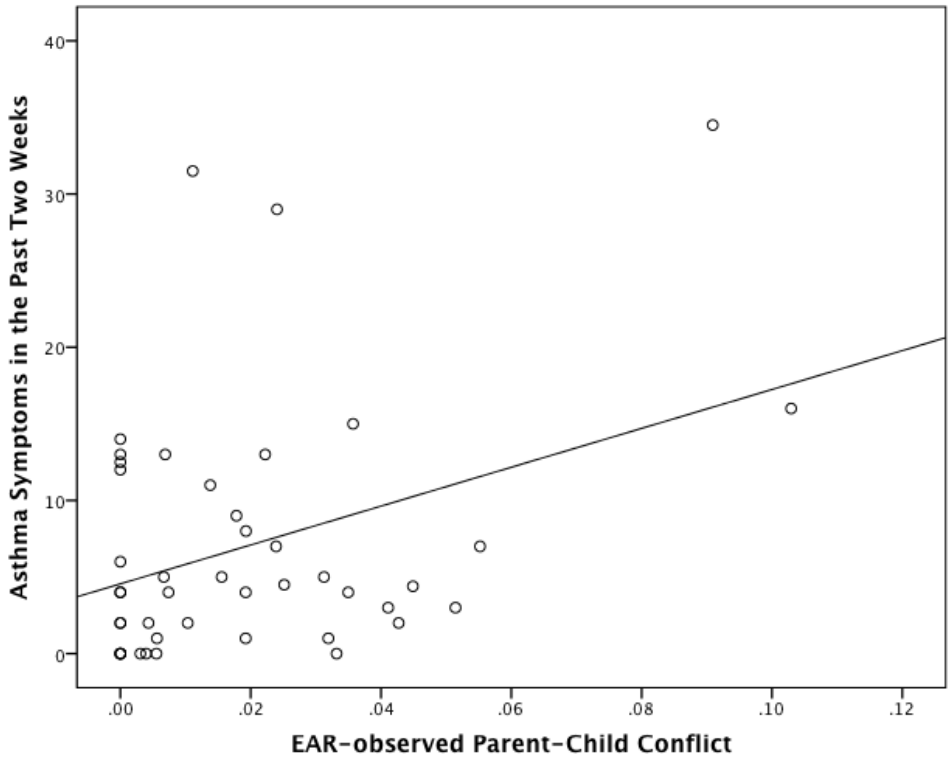

Figure 3. Scatterplot for EAR-observed Parent-Child Conflict Composite and Asthma Symptoms.

APPENDIX A

Family APGAR
(APGAR; Smilkstein, 1978)

1. When something is bothering me, I can ask my family for help.	Almost Always	Some of the Time	Hardly Ever
2. I like the way my family talks over things and shares problems with me.	Almost Always	Some of the Time	Hardly Ever
3. I like how my family lets me try new things I want to do.	Almost Always	Some of the Time	Hardly Ever
4. I like what my family does when I feel mad, happy, or loving.	Almost Always	Some of the Time	Hardly Ever
5. I like how my family and I share time together.	Almost Always	Some of the Time	Hardly Ever

APPENDIX B

Parental Environment Questionnaire, Conflict Subscale, Parent Version (PEQ; Miller & Hauser, 1989)

Please answer the following questions about your relationship with the target child.

1. I often lose my temper with my child.	Definitely True	Probably True	Probably False	Definitively False
2. I often have misunderstandings with my child.	Definitely True	Probably True	Probably False	Definitively False
3. My child and I often argue.	Definitely True	Probably True	Probably False	Definitively False
4. I often criticize my child.	Definitely True	Probably True	Probably False	Definitively False
5. My child often angers or annoys me.	Definitely True	Probably True	Probably False	Definitively False
6. I often hurt my child's feelings.	Definitely True	Probably True	Probably False	Definitively False
7. I often irritate my child.	Definitely True	Probably True	Probably False	Definitively False
8. I sometimes hit my child in anger.	Definitely True	Probably True	Probably False	Definitively False
9. My child has been really scared of me.	Definitely True	Probably True	Probably False	Definitively False
10. I often interrupt my child.	Definitely True	Probably True	Probably False	Definitively False
11. My child respects others more than me.	Definitely True	Probably True	Probably False	Definitively False
12. I often do not trust my child's decisions.	Definitely True	Probably True	Probably False	Definitively False

APPENDIX C

Parental Environment Questionnaire, Conflict Subscale, Child Version (PEQ; Miller & Hauser, 1989)

Now we'd like to know more about your relationship with your mom or female guardian.

1. My mother often loses her temper with me.	Definitely True	Probably True	Probably False	Definitively False
2. There are often misunderstandings between my mother and me.	Definitely True	Probably True	Probably False	Definitively False
3. My mother and I often get into arguments.	Definitely True	Probably True	Probably False	Definitively False
4. My mom often criticizes me.	Definitely True	Probably True	Probably False	Definitively False
5. I often seem to anger or annoy my mother.	Definitely True	Probably True	Probably False	Definitively False
6. My mother often hurts my feelings.	Definitely True	Probably True	Probably False	Definitively False
7. My mother often irritates me.	Definitely True	Probably True	Probably False	Definitively False
8. My mother sometimes hits me in anger.	Definitely True	Probably True	Probably False	Definitively False
9. Once in a while I have been really scared of my mother.	Definitely True	Probably True	Probably False	Definitively False
10. Before I finish saying something my mother often interrupts me.	Definitely True	Probably True	Probably False	Definitively False
11. I treat others with more respect than I treat my mother.	Definitely True	Probably True	Probably False	Definitively False
12. My mother does not trust me to make my own decisions.	Definitely True	Probably True	Probably False	Definitively False

APPENDIX D

Asthma Severity and Symptoms Questionnaire

Asthma Severity

How would you rate your wheezing?	None	Mild	Modest	Moderate	Severe
How would you rate your shortness of breath?	None	Mild	Modest	Moderate	Severe
How would you rate your coughing?	None	Mild	Modest	Moderate	Severe
How would you rate your chest tightness?	None	Mild	Modest	Moderate	Severe

Asthma Symptom Occurrences

In the last 2 weeks, how many days did you experience any wheezing?

In the last 2 weeks, how many days did you experience shortness of breath?

In the last 2 weeks, how many days did you experience any coughing?

In the last 2 weeks, how many days did you experience any tightness in your chest?

In the last 2 weeks, how many nights have you woke up because of wheezing, coughing, shortness of breath or chest tightness, or other asthma symptoms?

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ABSTRACT

THE INFLUENCE OF PARENT-CHILD CONFLICT AND STRESSFUL EXPERIENCES ON THE HEALTH OF YOUTH WITH ASTHMA

by

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May 2013

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Major: Psychology (Clinical)

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Attaining a clear picture of everyday family interactions is essential for understanding how family stress and conflict adversely affects children's health, especially in the context of chronic illness. Using a naturalistic observation sampling method called the Electronically Activated Recorder (EAR), we sought to investigate the effects of daily interpersonal conflicts and parental stress on pediatric asthma outcomes. We collected data from 81 children, aged 10 to 17 (*M* age = 12.88), and their primary caregiver as part of a larger study. Each child completed a pulmonary function test and self-report questionnaires of asthma symptoms. Asthma-related medical information was abstracted from their medical records. The Adult and Parent UCLA Life Stress Interview (LSI) assessed acute stress as the number of acutely stressful events in the past 6 months. Of these 81 participants, 45 children wore the EAR for 4 days. Trained research assistants coded the EAR files using the Everyday Child Home Observations (ECHO) Coding System for instances of interpersonal conflict (e.g., arguing, fighting, yelling) and asthma symptoms (e.g., coughing, wheezing). EAR-observed parent-child conflict ($r = .36$, $p < .05$) and EAR-observed family environment conflict ($r = .32$, $p < .05$) was positively associated with youth reported asthma symptoms. Further, EAR-observed wheezing coded was positively

associated with EAR-observed family environment conflict (r = .34, p < .05), conflict with fathers (r = .43, p < .01), and general conflict in the youth's life (r = .35, p < .05). Additionally, we found positive associations between recently experienced stressful events in the lives of parents and multiple measures of asthma morbidity, including Emergency Department use for asthma related symptoms (r = 0.28, p < 0.05), youth-BMI (r = 0.24, p < 0.05), youth-reported asthma symptoms (r = 0.36, p = 0.02) and asthma severity (r = 0.27, p < 0.05). We also found parental stress to negatively associated with pulmonary functioning (r = -0.29; p = 0.02) and with asthma clinic visits (r = -0.36; p < 0.01). These findings show that greater conflict in everyday life within the family and broad measures of stress in parent's lives are associated with multiple markers of asthma morbidity. This research has important implications for asthma interventions tailored to the individual and their family system.

AUTOBIOGRAPHICAL STATEMENT

Erin T. Tobin graduated from the University of Michigan, Ann Arbor, in May 2007 with a Bachelor's of Science in Neuroscience. Her undergraduate career consisted of rigorous coursework devoted to the understanding the biological underpinnings of the nervous system. She then completed a Master's of Arts in Medical Sciences at Loyola University of Chicago and worked as a Research Specialist for two years at Loyola University Stritch School of Medicine where her research would focus on the intersection of depression and cardiovascular disease. Although she was tempted by a career in medicine, after devoting much time to research and working closely with research participants, she quickly realized a career in the field of psychology where she could contribute with research and clinical work would make her most happy.

Erin entered the Doctoral Program in Psychology (Major: Clinical Psychology; Minor: Health Psychology) at Wayne State University in August 2010 under the joint supervision of Dr. Richard Slatcher and Dr. Annmarie Cano. Erin has authored a book chapter reviewing the link between family relationships and health, paying close attention to the biological mechanisms and processes. Currently, Erin is a practicum student in the Behavioral Health Unit at Henry Ford Hospital in Detroit, MI under the supervision of Dr. Anne Eshelman, completing pre-surgical diagnostic evaluations and pre-transplant family social support assessments. She is also an active contributor to the Close Relationships Lab. Her research interests include the impact of family relationships on physical and psychological health.