

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

THE ROLE OF TEMPERAMENT AND PARENTING IN THE PREDICTION OF
PRESCHOOL PROBLEM BEHAVIORS

LAURA MEADE
SPRING 2013

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Human Development and Family Studies
with honors in Human Development and Family Studies

Reviewed and approved* by the following:

Dr. Cynthia Stifter
Professor of Human Development and Psychology
Thesis Supervisor

Dr. Kathryn Hynes
Assistant Professor of Human Development and Family Studies
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

Psychopathology is steadily increasing and it has been found that the earlier the diagnosis of the problem, the more severe and longer lasting it will be. Research has shown that the interaction between biology and the environment is the strongest predictor of psychopathology. The aim of this study is to examine two components of temperament, negative affect and effortful control, and their prediction of behavior problems in preschool. The second aim of the study is to examine if positive parenting behaviors mediate the relationship between temperament and behavior problems. It was predicted that high levels of negative affect and low levels of effortful control will be the strongest predictor of behavior problems. Additionally, it was predicted that mother positive parenting behaviors will mediate the interaction between temperament and behavior problems. The study used measures of temperament and parenting behavior at 2 years (questionnaire and observation), and parental ratings of behavior problems at 4.5 years. Results showed that negative affect to be a strong predictor of behavior problems, while effortful control did not significantly relate to behavior problems. Mother positive affect did not significantly reduce the relationship between negative affect and behavior problems.

TABLE OF CONTENTS

List of Figures	iii
List of Tables	iv
Acknowledgements	v
Chapter 1-- Introduction.....	1
Chapter 2-- Methods	14
Chapter 3-- Results	18
Chapter 4-- Discussion.....	32
REFERENCES.....	38

LIST OF FIGURES

Figure 1-1. Moderation of Temperament and Problem Behaviors.	12
Figure 1-2 and 1-3. Mediation of Positive Parenting	12
Figure 1-4. Moderation-Mediation of Temperament, Parenting, and Behavior Problems.....	13

LIST OF TABLES

Table 1-1. Descriptive Statistics	23
Table 2-1. Pearson Correlation for Mom and Dad CBCL Report	25
Table 3-1. Bivariate Relations Among Variables.....	26
Table 4-1. Pearson Correlation For Parenting and Behavior Problems.....	27
Table 5-1. Linear Regression Among Temperament and Internalizing	28
Table 6-1. Linear Regression Among Temperament and Externalizing.....	29
Table 7-1. Linear Regression Among Temperament and Total Behavior.....	30
Table 8-1. Hierarchical Regression between Temperament, Mom PA, and Total.....	31

ACKNOWLEDGEMENTS

I would like to thank my thesis supervisor, Dr. Cynthia Stifter, for teaching me about child temperament and the steps to write an undergraduate thesis. I would also like to thank Dr. Kathryn Hynes for being my second reader and honors advisor. I would like to thank Mairin Augustine for helping with me understand the statistical information and data information.

Chapter 1

Introduction

There is an increasing prevalence of psychopathological problems occurring during adolescence. In early childhood, psychopathology is divided into two types: externalizing, and internalizing problem behaviors. Externalizing problem behaviors include non-compliance, aggression, and poor regulation. Common externalizing problem disorders include: Attentional Deficit Disorder (ADD), Conduct Disorder (CD), and Oppositional Defiance Disorder (ODD). Internalizing problem behaviors are characterized by anxiety, depression, and withdrawal (Muris, & Ollendick, 2005). Costello, Mustille, Erkanli, Keeler, and Angold (2003) found an increasing prevalence of externalizing and internalizing problems across a four year period of time in adolescence. Overall, 36.7% of the population studied met the full diagnostic criteria for a mental health disorder before age 16. The increasing prevalence of mental health problems in early adolescence is important because it leads to more severe problems later in life. Early emerging psychopathological disorders in adolescence have been found to last for a longer period of time and be more severe than those that develop in adulthood (Muris, & Ollendick, 2005)

Psychopathology is not a problem that develops at birth; it develops over time. As noted, Costello et al. (2003) found the prevalence of psychopathology (either externalizing or internalizing) to develop in adolescence. Campbell, Shaw, and Gilliom (2000) reviewed literature examining the early development of behavior problems and

the extent to which these problems persisted into adolescence. In general, children who had early signs of behavior problems had common traits that persisted across time: high ratings of hyperactivity and aggression, lower child IQ scores, low maternal sensitivity, low socioeconomic status, and stressful life events. The authors found the multiple risk factors associated with the child, parent, and living conditions led to the continuity of problem behaviors persisting through the lifespan. The question of interest is: What level of each factor (biological or environmental) is leading to the emergence of psychopathology?

Research has found the combination of a person's biology and the parental environment lead to the development of psychopathology; not just a single factor. A person's biology has a transactional relationship with the environment; in other words, each aspect has an effect on the other that leads to an overarching view of development (Muris, & Ollendick, 2005). Mantymaa, Purra, Luoma, Latva, Salmelin, and Tamminen (2012) examined the effect of child, parent, and family risk factors in the prediction of internalizing and externalizing problems at age five. Child risk factors included: chronic or severe health problems, difficult temperament, and symptoms of externalizing and internalizing problems. Parent risk factors were mother's mental health before and after pregnancy, father's mental health problems, parental stress, and mother's perception of child. Family risk factors included: socio-economic status, family violence, and marital relationship. The authors found a transactional relationship between all the risk factors in predicting both internalizing and externalizing problems across the study suggesting that not one factor is causing the behavior problem.

Campbell, Shaw, and Gillion (2000) found similar results in their study of a multi-risk group of children (pregnancy complications, higher hyperactivity and aggression, low socio-economic status, and more negative maternal parenting), which found these children to have the most stability in their behavior problems. The authors concluded it was due to a transactional process. The child contributes to his/her development by having biologically-based personality characteristics (temperament) that actively engage with the parental environment. The purpose of the present study is to examine whether biologically rooted temperamental traits of negative affect and effortful control predict the development of behavior problems. Positive parenting behaviors will be examined to assess if it is a mediating variable between temperament and behavior problems.

Temperament and Behavior Problems

Temperament is biologically based individual differences in behavior that can be exhibited early in life and are the basis of later personality characteristics (Bates, 1987). More specifically, Rothbart and Derryberry (1981) define temperament in terms of reactivity and self-regulation: reactivity refers to an individual's response to a changing stimulus, while self-regulation is the individual's ability to modulate their response to a stimulus. Temperament is genetically rooted, but can also be shaped by the environment (Derryberry & Rothbart, 1997). Rothbart's temperament framework, which guided the present study, focuses on three temperament super factors derived from extensive analysis of parent-rated temperament: surgency-extraversion, negative affectivity, and effortful control. Current research has examined the link between effortful control and negative affect in early childhood to later behavior problems. Effortful control has been

found to be the most significant temperament dimension related to later problem behaviors than surgency-extraversion and negative affectivity (Honomichl, & Donnellan, 2011).

Rothbart and Derryberry (1981) define negative affectivity as the susceptibility to have feelings of anger, sadness, and anxiety. Though research does not find this super factor of temperament to be the main effect in the development of psychopathology, it has been found to support claims of disordered behaviors. Loney, Lima, and Butler (2006) were interested in the relationship between similar and opposing magnitudes and direction of positive and negative affect in predicting depression, anxiety, and conduct disorder. The authors found high levels of negative affectivity to be predictive of conduct problems in adolescence; in addition, positive affect was predictive of conduct problems when it had the same magnitude and direction of negative affect. High levels of negative affect and low levels of positive affect were predictive of depression and anxiety in the sample. The most interesting finding was high levels of negative affectivity was predictive of conduct disorder no matter the direction and magnitude of positive affect. This result suggests that negative affectivity is more of a predictor of conduct problems than positive affectivity.

Lahey et al. (2008) examined aspects of negative affect such as fussiness and fearfulness at age 4 in the prediction of conduct problems at age 13. The authors found that fussiness was the most significant predictor of conduct problems at age 13. Eisenberg et al. (2009) found negative emotionality was predictive of maladjustment of children from age six to age nine. This study found that children high in anger were significantly more likely to have externalizing behavior problems and co-occurring externalizing and

internalizing problems. In summary, studies have found negative affect to be predictive of behavior problems, but it is unknown if children are just high in negativity, low in regulation, or a combination of both.

Effortful control, a form of self-regulation, is the ability of an individual to resist a dominant response for a more socially acceptable response (Rothbart, Ellis, Rueda, & Posner, 2003). Effortful control is composed of several dimensions including: inhibitory control, attentional focusing, low intensity pleasure, and perceptual sensitivity (Rothbart, 2004). Moderate levels of effortful control have been related to adaptive functioning, while low levels of effortful control have been found to lead to more behaviors problems later in life (Gusdorf, Karreman, van Aken, Dekovic, & van Tuijl (2011). Eisenberg et al. (2009) studied children from ages 9 to 12 to examine the effect of effortful control predicting externalizing, internalizing, and the co-occurrence (both internalizing and externalizing) of behavior problems. The authors found low levels of effortful control and high impulsivity led to the development of externalizing problems. Additionally, children who went from higher levels of externalizing problems to a lower status had higher levels of effortful control at later points in the study. Internalizing problems were related to anxious regulatory style than with those participants who had externalizing problems. Though effortful control has been found to have a significant relationship with the development of later externalizing problems, it would be necessary to examine the role of other temperamental factors in order to see if more than one aspect is at play. The current study will examine the dual role of effortful control and negative affectivity in the development of later total behavior problems.

Research examining the role of temperament in predicting later behavior problems mainly uses Rothbart's three broad categories of temperament: effortful control, negative affectivity, and surgency (Rothbart, & Derryberry, 1981). Whereas, many studies have found that effortful control alone to have the greatest predictability (Honomichl, & Donnellan, 2011) several studies have found the combination of negative affective and effortful control to have the greatest predictability. Muris, Meesters, and Blijlevens (2003) examined ten year old children in predicting externalizing problems from temperament and found the interaction of negative affectivity and effortful control to predict whether a child will develop a behavior problem and the severity of the problem. Specifically, high levels of negative affectivity and low levels of effortful control led to more severe cases of externalizing problems. Internalizing problems were characterized by high levels of fear (a dimension of negative affect) and low attentional control. The authors suggest that it was both the reactivity of the child (negative affectivity) and their inability to regulate (effortful control) emotions made a child more vulnerable to developing psychopathology.

Oldenhinkel, Hartman, Winter, Veenstra, and Ormel (2004) found related results concerning effortful control and negative affectivity in relation to behavior problems. Instead of the interaction of effortful control and negative affectivity deciding the severity of the psychopathology, they found effortful control led to the greatest predictability, while negative affectivity was more related to the severity of the problem. Oldenhinkel et al. (2004) found that it was the high levels of negative affectivity with low levels of effortful had the strongest predictability of externalizing problems in preadolescents. Additionally, high levels of fear and shyness were predictive of internalizing problems.

Valiente et al. (2003) examined the effect of effortful control in predicting externalizing problems with children age 7.5 years and then two or four years later. The study looked at the main effect of effortful control and the moderating effect of negative affectivity. The authors stated negative affectivity has been linked to predicting adjustment later in life; thus, they wanted to examine its' effect size in predicting externalizing problems. It was found that low levels of effortful control at 7.5 years were correlated to externalizing problems two or four years later. However, an interaction between negative affectivity and effortful control was found to be the best predictor of externalizing problems. As with other studies, a child who is low in effortful control and high in negative affectivity is at the greatest risk for developing externalizing problems later in life.

Valiente et al. (2003), Oldenhinkel et al. (2004), and Muris, Meesters, and Blijlevens (2003) all found negative affectivity and effortful control together are best in predicting the relationship between temperament and later behavior problems. The present study will examine the moderating relationship between negative affectivity and effortful control in predicting later behavior problems. Additionally, the study will examine if positive parenting behaviors mediate the relationship between temperament and total behavior problems.

Positive Parenting Behavior as a Mediator

Many of the studies examining the emergence of behavior problems and temperament do not take into account the effect of parental behavior. Parents have the ability to affect the environment the child experiences. For example, Sanson, Oberklaid, Pedlow, and Prior (1991) found early temperamental characteristics had little

predictability in the emergence of psychopathology, but when taking into account the mother-child relationship they were able to predict psychopathology. A specific parental behavior of interest in mediating the relationship between temperament and externalizing problems is positive parenting behaviors. In the present study, positive parenting behaviors include parental positive affect (warmth) and guidance/gentle control behaviors.

Fox, Platx, and Bentley (1995) conducted a study with mothers and their infants from 1 year of age to 4 years of age. The aim of the study was to evaluate how nurturing behaviors (warmth), discipline, and child behavior problems were related to one another. The study found mothers who used physical means of discipline to report more child behavior problems and to have lower levels of nurturance. The mothers also reported high levels of expectations for their child; thus, physical punishment was done when the mother's expectations of the child were not met. This study demonstrates the relationship between physical punishment and child behavior problems. Mothers who use more physical punishment and lower levels of nurturance were more likely to have children who suffered from behavior problems.

Stormshak, Bierman, McMahon, and Lengua (2000) studied children in the first grade and mother parenting behaviors. The authors examined the link between mothers' punitive discipline, inconsistency, warmth/ positive involvement, physical aggression, spanking and the child's behavior problems (aggression, hyperactivity, and oppositional-defiant disorder). Mother's punitive punishment and spanking were related to hyperactivity, oppositional, and aggressive behavior in children. Positive parenting and warmth was inversely related to the development of behavior problems suggesting that

higher levels of warmth and positive parenting may decrease the likelihood of a child developing problems. The authors stated that the results in the study are correlational meaning there is the possibility of a third-variable causing the relationship between parenting behaviors and child behavior problems. Fox et al. (1995) and Stormshak et al. (2000) both examined the relationship between mostly negative parenting behaviors and the development of child behavior problems. The current study will focus more on positive parenting behaviors than negative parenting behaviors.

Eisenberg et al. (2005) examined the relationship between positive parenting, child effortful control, and the development of externalizing behaviors. The authors found that parental warmth and positive parenting was related to high levels of effortful control and lower levels of externalizing behaviors. The study used both maternal and paternal warmth and positive parenting, which is different from the prior two studies that focused on maternal parenting behaviors. This finding suggest that positive parenting is related to better emotional regulation for the child, which is related to lower levels of behavior problems.

Many studies have focused on the impact of negative parenting behaviors, in particular mothers. Father parenting behaviors have not been the focus of many studies, but fathers do provide a unique parenting style that mothers do not. Fathers can play an instrumental role in a child's behavior because their parenting focuses on playing with their child. Fathers spend more time playing with their children than mothers. Mothers have been found to be more involved with the caregiving and emotional support parenting role. Father's display more "rough and tumble" play that requires the child to be able to control more of their emotional responses, in other words, emotion regulation

(Paquette, 2004). Since fathers can provide this type of play that is different from mothers, it is important to examine father's relationship to child temperament and behavior problems.

Jia, Kotila, and Schoppe-Sullivan (2012) conducted a study specific to fathers and the relationship with their child. The study wanted to examine if fathers could have an impact on child behavior problems in preschool. The study used both mother and teacher reports of child behavior problems, and examined the role of father's involvement in play and caregiving. The authors found that higher levels of father involvement in play were associated with decreases in externalizing and internalizing behavior problems and increases in social competence. An unusual finding was that increases in father involvement in caregiving was associated with increases in child internalizing problems, and was not associated with any other variables. The study is important because it supports the idea that fathers can have an effect on child behavior problems; thus, making it necessary to examine this unique parenting relationship.

The current study will focus on positive parenting behaviors (positive affect and guidance/gentle control) as mediator of the relationship between temperament and child behavior problems. Maternal and paternal positive parenting will be examined separately to determine the effect each parent has on the child. To further our knowledge on the effect of positive parenting behaviors, a larger sample size is needed as well as separate and combined measures of maternal and paternal positive parenting.

Hypotheses

Studies have found negative affect and effortful control to be predictive of behavior problems later in the life span. The current study will examine the impact of early

measures of temperament at 2 years predicting problem behaviors at 4.5 years. This study is different from previous studies because it will be using early measures of temperament to predict behavior problems in childhood versus preadolescence or adolescence. The first model in the study will examine the interaction between negative affect and effortful control in predicting later behavior problems (see Figure 1-1). It is hypothesized that 2 year old children with low levels of effortful control and high levels of negative affectivity will have more behavior problems at 4.5 years.

Additionally, positive and negative parenting behaviors have been found to affect the relationship between temperament and later behavior problems. Previous studies have focused on the impact negative parenting behaviors have on the development of behaviors problems with a focus on maternal negative parenting behaviors. Fathers provide a unique parenting role that is characterized by play that can help children to learn emotion regulation and less on emotional support. The current study will use information on mother and father positive affect and guidance/gentle control to create the dimension of positive parenting behaviors. The second and third model will determine if parenting mediates the relationship between negative affect and effortful control and later behavior problems. Mother and father positive parenting will be analyzed separately to determine their mediating effect. A fourth model will examine the moderation-mediating relationship between negative affect and effortful control in predicting later behavior problems with their interaction being mediated by positive parenting. It is hypothesized that positive parenting in both models will mediate the relationship between temperament and later problems behavior such that 2 year olds with low effortful control and high negativity whose parents (individually and separately) are low on positive parenting

behaviors will be at the greatest risk for problem behaviors at 4.5 years of age. It is also hypothesized that mother positive parenting will impact the mediation relationship between temperament and problem behaviors more than father positive parenting behaviors.

Figure 1-1: *Model of moderating relationship between effortful control and negative affectivity predicting problems behaviors*

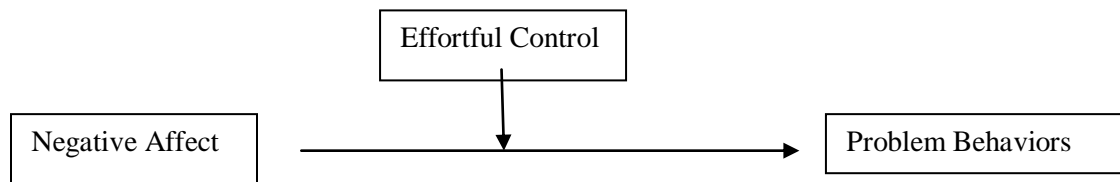


Figure1- 2: *Model temperament predicting problem behaviors mediated by maternal positive parenting*

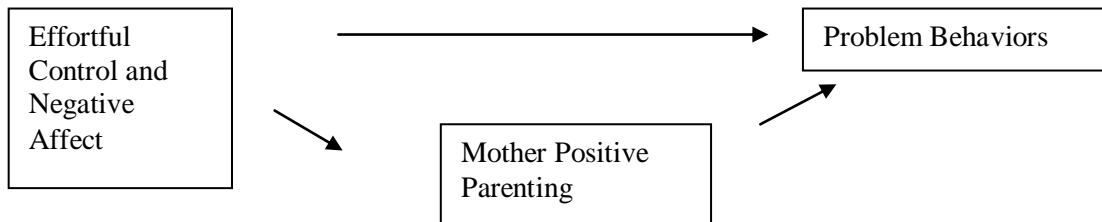


Figure 1-3: *Model temperament predicting problem behaviors mediated by paternal positive parenting*

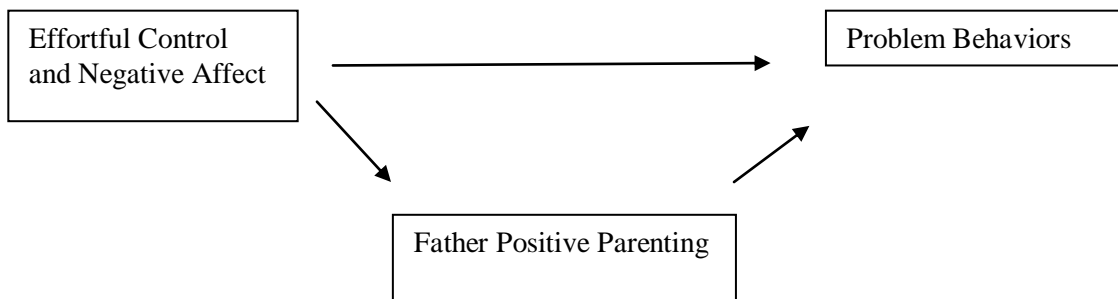
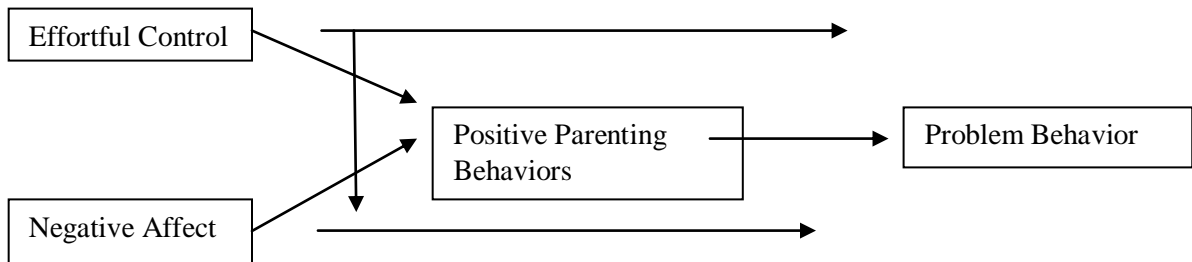


Figure 1-4: *Model of moderation relationship of effortful control and negative affect predicting problem behaviors mediated by positive parenting*



Chapter 2

Methods

Participants

The sample for this study was taken from a larger longitudinal study, which examined infants and their parents from 2 weeks to 7 years of age. A total of one hundred and fifty infants were participants at the two week visit. The current study will examine the role of temperament and positive parenting behaviors at 2 years of age and the development of behavior problems at 4.5 years. At the two year visit, there were 126 participants (63 female; M= 2.01). At the follow-up visit at 4.5 years, there were 72 participants (34 female; M=4.5 years).

The study consisted of mostly White participants (97% of original sample) with a small proportion being African American and either Asian or Native American (4.6% and 2%, respectively). Maternal age averaged at 29.7 years and paternal age average was 31.8 years during the first assessment point. A majority of the families averaged an income of \$50,000-\$75,000.

Procedures

2-year Visit

Mothers and their infants were asked to come into the laboratory at 24 months to assess temperament and parenting characteristics. Fathers and the infant came in one month later at 25 months to complete the same tasks as the mothers did at 24 months.

Clean-Up Task: After a four-minute free play task, the mothers and fathers were instructed to clean-up the toys with their children. Mothers and fathers were instructed to have their child put all the toys back in the basket. The clean-up task lasted one minute or early if the child put all the toys in the basket before the one minute.

Structured Free Play: The mother (or father) and the child were given legos to build a model based on a picture provided. The mother and father were instructed to work with the child in order to make a shape like the one presented in the picture. The mother (or father) and child had three minutes to complete the task.

Boredom Susceptibility-Prohibition Task: The mother and father at each of their laboratory visits were asked to complete a questionnaire while the child was given an array of “boring” toys. The boring toys were different for the mother and father visits. During the mother visit, the boring toys were simple objects including a block and saucer. The boring toy during the father visit was a small broken merry-go-round. After two minutes, a research assistant came into the room to drop off a basket of interesting toys that the child was not allowed to play with. The parents were told to not initiate any conversation with the child except to have them not play with or touch the interesting toys. The prohibition portion of this task lasted two minutes.

Measures

2-year Visit

Infant Behavior Record (IBR): The IBR was used to measure effortful control by rating the child’s attention span (being able to focus on an object for an extended amount of time) and object orientation (the ability to transfer attention to another object) across each laboratory visit by two experimenters. The IBR is based on a 9-scale for both

attention span and object orientation. For attention span, a 1 represents fleeting attention and a 9 represents long absorption in a toy. A score of 1 in object orientation represents no interests in objects and a 9 represents relinquishes to test material. These two dimensions have been found to be a proxy measure of effortful control since attention has been found to be the basis of effortful control (Gartstein & Rothbart, 2003). Scores for attention span and object orientation were averaged to create a measure of effortful control.

Toddler Behavior Assessment Questionnaire-Revised (TBAQ-R): The TBAQ-R was used to measure negative affect in the child during the two-year visit. This questionnaire asks parents questions about the child's activity level, anger/frustration, positive anticipation, pleasure, and social fear. Only the subscales for sadness, anger, and social fear were used in the present study. Example questions would include: "When a favorite toy was lost or broken, how often did your child show no sign of sadness?", "When frustrated or angry about something, how often did you child calm down within five minutes?" "When you child wanted to play outside but you said 'no', how often did s/he pout, frown, sulk, or look mad?" The mother and father rated the child on a 7-point scale from 1-being never to 7-being always. NA was provided if the behavior never occurred. The scores for sadness, anger, and social fear were averaged to create a measure of negative affect.

Positive Affect: Mother and father positive affect was coded during both the structured play task and the boring toy task. Positive affect was rated on a 5-point scale from 0 (no positive affect exhibited) to 5 (high levels of positivity) for the entire interval. Positive affect was coded if parents displayed such behaviors as laughing, broad smiles,

positive tone of voice, and exuberant body movements by the parent. Positive affect was coded in 5-second intervals (Cipriano & Stifter, 2010).

Parental control: Parental control was coded from clean-up task that mothers completed at 24 months and fathers completed at 25 months. Guidance/ gentle control was coded as parental behavior that controlled the child's behavior without being assertive. Direct commands were included in this measure. The measure was coded in 10-second intervals with the prevalence of the behavior observed during each interval.

4.5-year Visit

Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1991): The mother and father completed the CBCL at the 4.5 year visit. The CBCL provides two broad dimensions, internalizing and externalizing behavior problems. Questions include: "Can't sit still, restless, or hyperactive," "Disobedient at school," "Confused or seems to be in a fog," "Too fearful or anxious," "Fears he/she might think or do something bad," "Impulsive or acts without thinking." The scale was 0-2 from Not True to Very True/Very Often. High scores on this scale represent clinical levels of mental health problems (Achenbach & Edelbrock, 1991). The two dimensions of internalizing and externalizing behavior problems as well as their total will be used in the present study.

Chapter 3

Results

Preliminary Analyses

Prior to testing the hypotheses, preliminary analyses were run to examine intercorrelations among the variables and interrelations among the central variables. Mother and father positive affect and gentle control were not significantly related even at a marginal level. Analyses will be run with both on individual variable levels and as a composite for mother and father positive parenting behaviors. Table 1-1 provides the descriptive statistics for all variables used.

Pearson correlational analyses were run to examine the association between mothers and fathers ratings from the TBAQ-R to create a composite of negative affect. Mother and father ratings of sadness and anger were found to be significantly correlated ($r = .291$ and $r = .350$, respectively). Mom and dad reports of social fear were also significantly correlated with one another ($r = .284$; $p = .002$). A composite of negative affect was created based by averaging across parent measures of sadness, anger, and social fear.

A Pearson correlational analysis was also performed to create the composite of effortful control based on the subcategories of attention span and object orientation on the IBR. The variables were marginally significant at $p < .08$, so a composite of effortful

control was created (attention span $r=.224$; $p=.014$ and object orientation $r=.220$; $p=.016$).

Pearson correlational analyses were run to see if mother and father reports on the CBCL at 4.5 years of internalizing, externalizing, and total behavior problems were correlated. All of the reports were significantly correlated ($p<.05$). Composites for internalizing, externalizing, and total behavior problems were created by averaging across mother and father ratings. Refer to Table 2-1 for a complete list of correlations.

Pearson correlational analyses were run to examine initial relationships among child temperament, behavior problems, and positive parenting behaviors to determine if there are any associations. As can be seen in Table 3-1, child negative affect was found to be significantly correlated with Mom positive affect, externalizing problems, and total behavior problems. These results mean that as child negative affect increased, so did levels of Mom positive affect, and parental ratings of externalizing problems, and total behavior problems. Child negative affect was only marginally significant with Mom gentle control, and was not significantly related with any other variables. As can be seen in Table 3-1, child effortful control was only marginally significantly correlated with both Mom gentle control and Dad gentle control. Child effortful control was negatively correlated with levels of mom gentle control, but was positively correlated with Dad gentle control. Effortful control was not significantly correlated with any other variables.

Mom positive affect at 24 months was positively correlated with internalizing, externalizing, and total behavior problems (see Table 4-1). This result is interesting because it was hypothesized that mother positive affect would be negatively correlated with child behavior problems. Mom gentle control was only negatively correlated with

child internalizing problems at 4.5 years and no other variables. Father positive affect was only correlated with child internalizing problems at 4.5. Father gentle control was not found significant with any other variables.

When examining the relationship among the variables and the composites of mother and father positive parenting behaviors only a few correlations were significant. Child effortful control was only marginally correlated with father positive parenting behaviors ($r=.170$; $p=.063$). Child negative affect was positively correlated with mother positive parenting ($r=.178$; $p=.051$). No other variables were significantly correlated.

Potential Covariates

Child gender and mother and father's years of education were tested to see if they would have to be controlled for in future analyses. Child gender was significantly correlated with only Dad positive parenting at 25 months ($r=.217$; $p=.016$). Mother's years of education was found to be marginally correlated with child internalizing problems at 4.5 years ($r= -.231$; $p<.060$) and significantly negatively correlated with externalizing and total behavior problems at 4.5 years ($r= -.248$; $p=.043$ and $r= -.255$; $p=.037$, respectively). Father years of education was not significantly related with any of the variables. Only mother education will be controlled for in analyses examining behavior problems.

Primary Analyses

Hypothesis 1

It was hypothesized that high levels of child negative affect and low levels of effortful control at 2 years of age would be related with behavior problems at 4.5 years. After the preliminary analyses, linear regressions were completed to see if the interaction of negative affect

and effortful control were related to problem behaviors. Mom's years of education was controlled for in each of the models. The model was significant for externalizing problems, $F(4,61) = 2.96$; $p = .03$, and near significant for total behavior problems, $F(4,41) = 2.09$; $p < .10$. A main effect for negative affect in predicting externalizing behaviors and total problem behaviors was significant, but effortful control was not significantly related to problem behaviors. For each of the dimensions of behavior problems as well as their total, the interaction between negative affect and effortful control was not significant. Table 5-1, 6-1, and 7-1 provides the specific statistics.

Hypothesis 2

It was hypothesized that positive parenting behaviors would mediate the relationship between negative affect and effortful control and behavior problems. Mother and father positive parenting behaviors were examined separately to see if one parent had more of an effect than the other. Conditions to test the model require that the predictor variable (temperament) was significantly related to the mediator (positive parenting behaviors), and the mediator be significantly related to the outcome variable (problem behaviors). The model also required that the predictor variable (temperament) and the mediator be significantly correlated with the outcome variable (problem behaviors). Father parenting behaviors (positive affect, gentle control, or composite of positive parenting) was not found to be significantly correlated with temperament; thus, the model could not be tested. The only variables that met the conditions were child negative affect, mother positive affect, and total behavior problems.

A hierarchical regression was run to test if child negative affect was related to total behavior problems mediated by mom positive affect because during the preliminary analyses these were found to be correlated with one another. In the first step, negative affect was tested to see if it was related to total behavior problems while controlling for mom's education. Next, the mediation of mom's positive affect was tested. The model for total problem behaviors when mother positive affect mediated negative affect was moderately significant, $F\text{-Change } (1.62) =$

2.99; $p < .10$. It was found that child negative affect was significantly related to total behavior problems in the first step ($beta = .240$; $p < .048$), but when mom's positive affect is added to the interaction the relationship between negative affect and total behavior problems becomes only marginally significant ($beta = .205$; $p < .090$), suggesting that maternal positive affect partially mediated the relationship between child negative affect and total behavior problems. However, a Sobel test was run to examine if the relationship between child negative affect and total behavior problems is reduced due to the inclusion of mom positive affect. The z-score was 1.32 with a p-value of .18 meaning that the mediation variable of mom positive affect was found to not be significant. Although mom positive affect is partially mediating the relationship between child negative affect and total behavior problems, the reduction was not meaningful. Table 8-1 provides the hierarchical regression model data.

Hypothesis 3

It was hypothesized that positive parenting behaviors would mediate the moderation interaction between negative affect and effortful control predicting behavior problems. Since the interaction between negative affect and effortful control was not related to problem behaviors (internalizing, externalizing, and total behavior problems) whether the interactions was mediated by parenting behaviors could not be tested.

Table 1-1

Descriptive Statistics for Variables in the Full Sample

Variable	Mean (<i>M</i>)	Standard Deviation (<i>SD</i>)
CBCL Internalizing Problems	5.27	4.39
CBCL Externalizing Problems	9.40	7.23
CBCL Total Behavior Problems	14.64	10.78
IBR Effortful Control Composite	6.30	.94
Object Orientation (24 months)	6.41	1.25
Attentional Span (24 months)	6.30	1.51
Object Orientation (25 months)	6.36	1.20
Attention Span (25 months)	6.17	1.27
TBAQ-R Negative Affectivity Composite	3.65	.51
Anger (24 months)	3.79	.73
Sadness (24 months)	3.57	.68
Anger (25 months)	3.76	.71
Sadness (25 months)	3.49	.62
Paternal Positive Parenting Composite	.51	.16

		24
Dad Positive Affect	.09	.11
Dad Gentle Control/Guidance	.89	.17
Maternal Positive Parenting Composite	.59	.15
Mom Positive Affect	.15	.16
Mom Gentle Control/Guidance	.97	.09

Table 2-1
Pearson Correlations among Mom and Dad reports on the CBCL at 4.5 years

	Dad Internalizing Problems	Dad Externalizing Problems	Dad Total
Mom Rating of Internalizing Problems	.501*	.427*	.488*
Mom Rating of Externalizing Problems	.307*	.567*	.504*
Mom Total	.381*	.516*	.504*

*p<.01

Table 3-1
Bivariate Relations Among the Variables

Variables	1	2	3	4	5	6	7	8	9
1. Child Negative Affect	-----	-.026	.182**	.167*	.018	-.042	.055	.340**	.257**
2. Child Effortful Control		-----	.133	-.168*	-.078	.157*	.033	-.016	.005
3. Mom Positive Affect			-----	.108	-.046	-.101	.256**	.208*	.261**
4. Mom Gentle Control				-----	-.279**	-.090	-.289**	.008	-.115
5. Dad Positive Affect					-----	.045	.215*	.108	.159
6. Dad Gentle Control						-----	.154	.088	.104
7. Internalizing Behavior Problems							-----	.683**	.872**
8. Externalizing Behavior Problems								-----	.949**
9. Total Behavior Problems									-----

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4-1

Pearson correlations among parenting variables and child behavior problems

	Child Internalizing Problems	Child Externalizing Problems	Child Total Behavior Problems
Mom Positive Affect	.256**	.208*	.261*
Mom Gentle Control	-.289**	.008	-.115
Dad Positive Affect	.215*	.108	.159
Dad Gentle Control	.154	.088	.104

* p < .10 ** p < .05

Table 5-1

Linear Regression Model of Child Negative Affect and Effortful Control Predicting Internalizing Behavior Problems Controlled by Mom Education

Variables	β	SE B	B
Mom's Education	-.255**	.254	-.550
Negative Affect	.189	1.24	1.85
Effortful Control	-.016	.604	-.077

** $p < .05$

Table 6-1

Linear Regression Model of Child Negative Affect and Effortful Control Predicting Externalizing Behavior Problems Controlled by Mom Education

Variables	β	SE B	B
Mom's Education	-.200**	.409	-.695
Negative Affect	.322**	1.871	5.229
Effortful Control	-.002	.976	-.015

** $p < .05$

Table 7-1

Linear Regression Model of Child Negative Affect and Effortful Control Predicting Total Behavior Problems Controlled by Mom Education

Variables	β	SE B	B
Mom's Education	-.213**	.626	-1.104
Negative Affect	.250**	2.865	5.883
Effortful Control	.066	1.495	.068

** $p < .05$

Table 8-1

Hierarchical Regression Model Predicting Total Behavior Problems from Child Negative Affect and Mom's Positive Affect Controlled by Mom's Education

Variables & Steps	β	R^2	ΔR^2
1. Mom's Education	-.213**	.111**	.11
Child Negative Affect	.240**		
2. Mom's Education	-.203*	.152*	.041*
Child Negative Affect	.205*		
Mom's Positive Affect	.205*		

** $p < .05$, * $p < .10$

Chapter 4

Discussion

The aim of the current study was to examine if early measures of temperament would predict behavior problems later in life. Additionally, the study wanted to examine if positive parenting behaviors would mediate the relationship between temperament and behavior problems. While only a few relationships were found, negative affect was found to predict behavior problems. Parenting was only found to marginally mediate the relationship between temperament and behavior problems.

Hypothesis 1

It was hypothesized that high levels of negative affect and low levels of effortful control would be the greatest predictor of problem behavior. It was found that the moderation models of temperament predicting externalizing and total behavior problems were significant, with negative affect emerging as directly affecting problem behavior. The interaction between negative affect and effortful control, however, was not significant.

The results of the study seem to support the notion of child negative affect as a good predictor of later behavior problems. Children rated as high in negative affect were more likely to exhibit problem behavior, particularly of the externalizing type. Previous studies have found similar results with negative affect predicting behavior problems (Loney, Lima, & Butler, 2006; Lahey et al., 2008). The current study helps to support

previous studies by using an earlier measure of negative affect to predict behavior problems at an earlier age. Children with high levels of negative affect are at risk for problem behaviors because they have higher levels of anger, which may make them more susceptible to externalizing types of behavior problems.

There is the possibility of a parental bias concerning child negative affect and ratings of behavior problems. Both mother and fathers completed questionnaires concerning their child's negative affect and behavior problems. It is possible for shared variance in these measures; meaning parents who believed their child to be more negative would rate their child with more problem behaviors. Cross-correlations were completed to examine if mother (or father) ratings of child negative affect were significantly correlated with father (or mother) ratings of child behavior problems. It was found that mother's rating of child anger was significantly correlated with father's rating of externalizing ($r=.333$; $p=.012$) and total behavior problems ($r=.273$; $p=.043$). Mother's composite rating of negative affect was found to be marginally correlated with father ratings of externalizing problems ($r=.242$; $p=.073$). Father's composite rating of child negative affect was found to be significantly correlated with mother's rating of externalizing problems ($r=.261$; $p=.042$). The results of these cross-correlational analyses mean that there is not shared variance among raters; thus, it can be assumed that the measures of both negative affect and behavior problems in children were not based on parental perceptions about the child.

Support for the significance of this relationship is the length of time between rating of child negative affect and ratings of behavior problems (2.5 years). If the two

measures were taken at the same time, there would be more of a concern about the validity of the findings.

Child effortful control was not found to be significant in the moderation of the relationship between temperament and behavior problems. Effortful control was measured by attention span and object orientation in order to predict behavior problems. Though Gartstein & Rothbart (2003) found early measures of attention to act as proxies for effortful control, the age in which the measure was taken may have still been too early to accurately measure effortful control. Effortful control does not emerge until preschool, so the early measures of attention may not have been an accurate representation of this variable. In other studies, effortful control was measured at older ages; thus, more able to accurately measure the predictability of effortful control and behavior problems.

Hypothesis 2

It was hypothesized that mother positive parenting behaviors would mediate the relationship between temperament and behavior problems more than father positive parenting behaviors. In order for this model to be completed, the temperament variable had to be significantly related to the positive parenting variable, which had to be significantly correlated to a behavior problem. Additionally, the temperament variable had to be significantly correlated with the behavior problem variable. Father positive parenting variables were not significantly correlated to either negative affect or effortful control; thus, could not be tested in this model. Instead, only the model that examined if mother positive affect mediating the relationship between child negative affect and total behavior problems was able to be tested. It was found that negative affect was significantly related to total behavior problems ($p=.048$), but when the mediator variable

of mother positive affect the relationship was reduced to only be moderately significant ($p=.090$). It could be potentially said that mother positive affect can mediate the relationship between child negative affect and total behavior problems due to the changes in the r-squared variable. With the addition of the Sobel test, it was found mother positive affect did not significantly mediate the relationship; thus, mother positive affect does not reduce the relationship between child negative affect and total behavior problems. The result of this mediation model means that child negative affect is more directly related to total behavior problems rather than mediated by parenting.

While mother positive affect did not mediate the relationship between temperament and behavior problems, some other parenting behaviors were found to be significantly correlated with behavior problems. Mother positive affect was significantly correlated with internalizing behavior problems ($r=.256$; $p=.037$), and father positive affect was marginally correlated with internalizing behavior problems ($r=.215$; $p=.083$). The result seems counterintuitive because it would be assumed that parental positive affect would reduce the likelihood of internalizing behavior problems. A possible explanation for this association could be the time displacement from the rating of parental positive affect and internalizing behavior problems (2.5 years). Parenting behaviors in those 2.5 years could have changed; thus, causing the child to exhibit more anxious and depressive behaviors. Additionally, there may be other intervening variables causing the relationship like parental stress or change in parental mental health status.

Mother gentle control was found to be negatively correlated with internalizing problems ($r=-.289$; $p=.021$), which is consistent with the literature. It has been found that

gentle control and guidance will lessen the child's behavior problems (Stormshak et al., 2000).

Hypothesis 3

The moderation-mediation model was developed to examine if the moderation between negative affect and effortful control was mediated by positive parenting behaviors to predict behavior problems. Since the interaction between negative affect and effortful control was found to not be significant, the hypothesis for the moderation-mediation model could not be confirmed.

Implications

The study found that child negative affect was the strongest predictor of behavior problems, particularly externalizing behavior problems. When examining if mother positive affect mediated the relationship between child negative affect and total behavior problems, it only marginally reduced the relationship. These findings suggest that interventions may want to focus on child negative affect, especially the feelings of anger, sadness, and social fear. If parents were to better understand and handle their child's negative affect that could lead to a decrease in behavior problems.

Limitations

There were some limitations to this study. First, there was attrition that happened in between the two year visit and the 4.5 year visit. It was found that the participants that did drop out of the study were not significantly different from the original sample, but it led to a decrease in the power to detect small effects. Second, the sample used was fairly similar in race and ethnicity. A more diverse sample would allow for more child

differences as well as differences in parenting strategies. Finally, effortful control was measured by using the proxies of attention span and object orientation from the IBR. A more accurate or later measure of effortful control could have led to more significant results pertaining to effortful control predicting behavior problems.

Future research on this subject matter should consider examining later measures of negative affect and effortful control to gain a better picture of a child's temperament in the prediction of behavior problems. Later measures plus the 4.5 year measure of behavior problems should be used to examine the stability of the behavior problems and if parenting can truly affect the child. Additionally, observational measures of the temperament subcategories could lead to a better picture of a child's temperament besides the use of questionnaires filled out by the parents.

In conclusion, the aim of the study was to examine if measures of child negative affect and effortful control at age 2 would predict behavior problems at age 4.5. The study also aimed to examine if mother and father positive parenting behaviors (positive affect and gentle control) would mediate the relationship between temperament and behavior problems. The study found that child negative affect and effortful control did not significantly interact to predict behavior problems, but child negative affect did significantly predict externalizing behavior problems. The mediational role of mother positive affect was tested but it did not significantly mediate the relationship between child negative affect and total behavior problems. Thus, child negative affect appears to be the strongest predictor of behavior problems at 4.5 years.

REFERENCES

- Achenbach, T.M., & Edelbrock, C. (1991). *Manual for the Child Behavior Checklist and 199Z Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Campbell, S.B., Shaw, D.S., & Gilliom, M. (2000). Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467-488.
- Cipriano, E.A., & Stifter, C.A. (2010). Predicting preschool effortful control from toddler temperament and parenting behavior. *Journal of Applied Developmental Psychology, 31*(3), 221-230.
- Constello, E.J., Mustille, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*, 837-844.
- Bates, J.E. (1987). Temperament in infancy. In J.D. Osofsky (Ed.), *Handbook of infant development* (pp. 1101-1149). New York: Wiley.
- Derryberry, D. & Rothbart, M.K. (1997). Reactive and effortful processes in the organization of temperament. *Development and Psychopathology, 9*, 633-652.
- Eisenberg, N., Valiente, C., Spinrad, T.L., Cumberland, A., Liew, J., Reiser, M., Zhou, Q., & Losoya, S.H. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology, 45*(4), 988-1008.

- Eisenberg, N., Zhou, Q., Spinrad, T.L., Valiente, C., Fabes, R.A., & Liew, J. (2005). Relations among positive parenting, children's effortful control, and externalizing problems: A three-wave longitudinal study. *Child Development, 76*(5), 1055-1071.
- Fox, R.A., Platz, D.L., & Bentley, K.S. (1995). Maternal factors related to parenting practices, developmental expectations, and perceptions of child behavior problems. *The Journal of Genetic Psychology, 156*(4), 431-441.
- Gartstein, M.A., & Rothbart, M.K. (2003). Studying infant temperament via the revised infant behavior questionnaire. *Infant Behavior and Development, 26*(1), 64-86.
- Gusdorf, L.M.A., Karreman, A., van Aken, M.A.G., Dekovic, M., & van Tuijl, C. (2010). The structure of effortful control in preschoolers and its relation to externalizing problems. *British Journal of Developmental Psychology, 29*, 612-634.
- Honomichl, R.D., & Donnellan, M.B. (2011). Dimensions of temperament in preschoolers predict risk taking and externalizing behaviors in adolescents. *Social Psychology and Personality Science, 3*(1), 14-22.
- Jia, R., Kotila, L.E., & Schoppe-Sullivan, S.J. (2012). Transactional relations between father involvement and preschoolers' socioemotional adjustment. *Journal of Family Psychology, 26*(6), 848-857.
- Lahey, B.B., Van Hulle, C.A., Keenan, K., Rathouz, P.J., D'Onofrio, B.M., Rodger, J.L., & Waldman, I.D. (2008). Temperament and parenting during the first year of life predict future child conduct problems. *Journal of Abnormal Child Psychology, 36*, 1139-1158.

- Loney, B.R., Lima, E.N., & Butler, M.A. (2006). Trait affectivity and nonreferred adolescent conduct problems. *Journal of Clinical Child and Adolescent Psychology, 35*(2), 329-336.
- Mantymaa, M., Puura, K., Luoma, I., Latva, R., Salmelin, R.K., & Tamminen, T. (2012). Predicting internalizing and externalizing problems at five years by child and parental factors in infancy and toddlerhood. *Child Psychiatry and Human Developments, 4*, 153-170.
- Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: Relations to internalizing and externalizing problem behavior and “Big Three” personality factors. *Journal of Adolescence, 30*, 1035-1049.
- Muris, P., & Ollendick, T.H. (2005). The role of temperament in the etiology of child psychopathology. *Clinical Child and Family Psychology Review, 8*(4), 271-289.
- Oldehinkel, A.J., Hartman, C.A., De Winter, A.F., Veenstra, R., & Ormel, J. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16*, 421-440.
- Paquette, D. (2004). Theorizing the father-child relationship: Mechanisms and developmental outcomes. *Human Development, 47*, 193-219.
- Rothbart, M.K. (2004). Commentary: Differentiated measures of temperament and multiple pathways to childhood disorders. *Journal of Clinical Child and Adolescent Psychology, 33*(1), 82-87.

- Rothbart, M.K., & Derryberry, D. (1981). Development of individual differences in temperament. In M.E. Lamb & A.L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp.37-86). Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- Rothbart, M.K., Ellis, L.K., Rueda, M.A., & Posner, M.I. (2003). Developing mechanisms of temperamental effortful control. *Journal of Personality*, 71(6), 1113-1144.
- Sanson, A., Oberklaid, F., Pedlow, R., & Prior, M. (1991). Risk indicators: Assessment of infancy predictors of pre-school behavioural maladjustment. *Journal of Child Psychology and Psychiatry*, 32, 609-626.
- Stormshak, E.A., Bierman, K.L., McMahon, R.J., & Lengua, L.J. (2000). Parenting practices and child disruptive behavior problems in elementary school. *Journal of Clinical Child Psychology*, 29(1), 17-29.
- Valiente, C., Eisenberg, N., Smith, C.L., Reiser, M., Fabes, R.A., Losoya, S., Guthrie, I.K., & Murphy, B.C. (2003). The relations of effortful control and reactive control to children's externalizing problems: A longitudinal assessment. *Journal of Personality*, 71(6), 1171-1196.

ACADEMIC VITA

Laura Meade

2716 Pocono Drive

York, PA 17402

Lem5241@psu.edu

Education

B.S., Human Development and Family Studies, 2013, The Pennsylvania State University,
University Park, PA

Honors and Awards

- University Trustee Scholarship Recipient, August 2009
- Schreyer Honors Scholar, August 2011
- Lewis Trustee Scholarship Recipient, August 2011
- Lord Academic Excellence Scholarship Recipient, January 2012
- Suzann Andrews Tedesco Award Recipient, August 2012

Association Memberships/Activities

- Student Member of the American Occupational Therapy Association (AOTA)

Research Experience

- Undergraduate Research Assistant in the Back to Baby Basics Project, The Pennsylvania State University, University Park, PA

Research Interests

I have a broad interest in human development and the emergence of behavior problems.

Specifically, I am interested in early precursors of behavior problems and intervention strategies.