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THE EFFECT OF PARENT ANXIETY LEVELS  
ON CHILD TEMPERAMENT AND  
BEHAVIOR PROBLEMS

by

FILZA KHAN

Presented to the Faculty of the Honors College of  
The University of Texas at Arlington in Partial Fulfillment  
of the Requirements  
for the Degree of

HONORS BACHELOR OF SCIENCE IN PSYCHOLOGY

THE UNIVERSITY OF TEXAS AT ARLINGTON

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## ABSTRACT

### THE EFFECT OF PARENT ANXIETY LEVELS ON CHILD TEMPERAMENT AND BEHAVIOR PROBLEMS

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The University of Texas at Arlington, 2014

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The current study examines the relationship between parent's anxiety levels and their children's temperament and behavior problems. Temperament is defined as early emerging individual differences in emotional and behavioral dimensions of development. It is generally considered to be biologically-based, relatively stable, and serves as the basis for adult personality. Temperament dimensions are related to early child behavior problems, which in turn may predict psychopathology outcomes. Participants included 201 children (104 Male) between the ages of 2.5 and 5.5 years and their parents. Parents completed a self-reported anxiety symptom inventory, and questionnaires assessing their children's temperament and behavior problems. Mean gender differences were examined for all child variables, and bivariate correlation

analyses were performed on all parent and child data. Results indicated that both parent State and Trait Anxiety levels were associated with ratings of child temperament and behavior problems. Trait Anxiety was a more significant indicator of child outcomes.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Temperament and Behavior Problems

The classification of temperament can be traced back to around 130-200 CE, to the Greek philosopher and physician, Galen, and his theory of the four humors (Stelmack & Stalikas, 1991). Galen's theory stated that humans have certain bodily fluids such as bile, blood, and phlegm that correspond to personality profiles and diseases. An individual's temperament (Latin, *temperare*) was thought to have been derived from the blended outcome of the fluids. Although the theory was ultimately disproven, a basic concept of temperament had been established.

In more recent years, modern temperament researchers such as Thomas and Chess, Buss and Plomin, Rothbart, and Goldsmith presented their separate conceptualizations of temperament, and offered a consensus on their findings (Goldsmith, et al. 1987). The theorists may have differed on the exact definition of temperament, but they did agree that temperament was early-emerging, genetically-inherent, related to behavioral tendencies, and stable, to a certain degree. In the current study, temperament is defined as the biologically-based individual differences in attention, motor, and emotional reactivity, and self-regulation (Rothbart, 2007; Rothbart & Bates, 2006). Reactivity is the onset, duration, and intensity of a reaction (in the domains of attention, motor, or emotion) to a stimulus (Rothbart, Ellis, Posner, 2004).

Whereas self-regulation is the ability of an individual to control the level of reactivity one expresses, as well as controlling innate behavior.

Many theorists conceptualized temperament in broad categories such as reactivity and regulation (Rothbart, 2007), or as children who are temperamentally easy, difficult, and “slow-to-warm-up” (Thomas & Chess, 1977). However, most current studies focus on more discrete dimensions, such as Activity Level, Inhibitory Control, Soothability, Social Fear, Object Fear, and more (Goldsmith, 1996). Activity Level is bodily movement expressed during a variety of daily situations. Inhibitory Control is the ability to control impulsive behavior when instructed to. Soothability is described as the rate of recovery after general arousal. Social Fear is simply the fear of people and/or social situations, while Object Fear is the fear of a particular stimuli or situation.

Behavior problems are also early emerging, and typically involve negative behavior patterns (Saudino, Carter, Purper-Ouakil, & Gorwood, 2008). Many studies focus on two key domains of behavior maladjustments: internalizing and externalizing problems. The internalizing domain is often defined as problematic actions turned in toward the individual, and is often associated with anxiety, fearfulness, depression, and withdrawal (Rapport, Denney, Chung, & Hustace, 2001). Externalizing problems, on the other hand, are actions directed outward, possibly at others (Rapport et al., 2001). Externalizing behaviors are often associated with conduct disorders, aggression, and attentional deficit/hyperactivity disorder (ADHD).

There is considerable research that shows that child temperament is associated to developmental behavior problems. For example, a longitudinal study assessed

approximately 120 children between the ages of 6 and 36 months on dimensions of mental development, temperament, and behavior problems (Bates, Maslin, & Frankel, 1985). At 6, 13, and 24 months, mental development and temperament were assessed during home and lab-visits, along with behavior problems at 24 and 36 months. The results regarding the early emergence of temperament indicated that temperament was predictive of behavior problems. For instance, children who displayed higher levels of activity and an overall difficult temperament at 12 months were shown to have behavior problems at 36 months.

Another study that supports the link between temperament and behavior problems, conducted by Caspi, Henry, McGee, Moffitt, & Silva (1995), found that early child temperament provides a predictive relationship for age-related outcomes in behavior problems and child psychopathology. The study assessed a sample of over 800 children on temperament and behavior problems from the ages of 3 – 15 years. Every two years, at ages 3, 5, 7, and 9, examiners would rate children's behaviors during a psychological evaluation, and derive a measure of temperament from the scores. Over the years a different examiner, who was blind to the previous ratings of child temperament, examined children. The study compared examiner ratings of child temperament at ages 3 and 5 to teacher and parent ratings of behavior problems at ages 9 and 11. Their results indicated that temperament characteristics present in young children were predictive of related behavior problems during the adolescent years. For example, children low in the temperament dimension of Inhibitory Control ("Lack of

Control”) at ages 3 and 5 were found to be rated higher for Externalizing behavior problems at ages 9 – 15.

Substantial research with twin studies has also demonstrated that genetic and environmental factors are both important for the etiology of child temperament and behavior problems (Goldsmith, Buss, & Lemery, 1997; Goldsmith & Gottesman, 1981; Mikolajewski, Allan, Hart, Lonigan, & Taylor, 2012). Twin studies allow researchers to estimate how much genetic and environmental factors contribute to a behavior, or set of behaviors.

A recent twin study examined behavior problems and emotionality in over 690 pairs of same-sex twins. The study recruited participants, ranging from ages 7 – 13 years, through the Florida Twin State Registry, a statewide database (Mikolajewski et al., 2012). The researchers only recruited those twins that had the same last name, same birthday, attended the same school, and were in grades K-5. Participants were rated by parents on externalizing and internalizing behaviors, as well as on positive and negative affect or emotionality. The results indicated that MZ twins had higher interclass correlations for affect and behavior variables than DZ twins, suggesting that genetic factors significantly influence temperament. Model-fitting analyses showed that genetic and environmental influences were shared between children’s negative affect and internalizing and externalizing behavior problems. The study’s findings imply that children high in temperament dimensions related to negative affect (e.g., high anger and sadness, low pleasure) are more likely to exhibit behavior problems.

There is also literature that suggests that moderate degrees of gender differences exist in temperament (Else-Quest, Hyde, Goldsmith, Van Hulle, 2006; Gagne, Miller, & Goldsmith, 2013). A meta-analysis was conducted on 189 studies focusing on child temperament (Else-Quest et al., 2006). All studies were coded and then effect sizes were calculated for mean gender differences. The results indicated a significant gender difference in effortful control, with girls rated higher in dimensions of attention, interest, inhibitory control, and related dimensions. Boys were rated higher on measures of impulsivity, activity level, high-intensity pleasure, and related dimensions. Considering child temperament's relationship to behavior problems, the study's findings possibly suggest that girls are more likely to exhibit internalizing behavior problems and related temperament dimensions, while boys are more likely to express externalizing behavior problems and related temperament dimensions.

### 1.2 Parent Anxiety

Anxiety is characterized by feelings of tension, and excessive worry (Major et al., 2000). According to a survey conducted by the National Institute of Health (Kessler, Chiu, Demler, & Walters, 2005) the U.S. prevalence rate of adult anxiety disorders, lasting at least 12 months, is 18.1% in the general population. Previous research indicates that when parents exhibit certain levels of psychopathology, such as anxiety disorders, their child is often put at risk for the same or related disorder (Biederman et al., 2006; Volbrecht & Goldsmith, 2010). A longitudinal study on the topic followed up on families with children where one parent had been diagnosed with a type of anxiety disorder, and/or major depression disorder (Biederman et al., 2006). Participants

included 216 children with at least one parent diagnosed with an anxiety or depressive disorder, or both, and 103 children with healthy parents. The results revealed that parents with the anxiety disorder alone placed their children at higher risk for also developing an anxiety disorder. Similarly, parents with major depression placed their children at higher risk for developing major depression, along with a host of other problem behaviors. Looking at aspects of child temperament and behavior problems concluded this.

Family environment is also a significant factor in predicting child temperament and behavior problem outcomes (Burstein, Ginsburg, & Tein, 2010; Hastings, Nuselovici, Rubin, & Cheah, 2010). For instance, parents experiencing anxiety or other dimensions of neuroticism were found to be more negative in their perception of child behavior problems (Hastings et al., 2010). Also, when researchers examined parents of shy or anxious children, they noted that mothers high in neuroticism were found to be more controlling, less responsive, and overprotective. There is growing literature on the topic of parental control on child mental health that suggests that more controlling parents may place their children at higher risk for poor mental health (Van der Bruggen, Stams, & Bögels, 2008). Although the direction of the association is still debated by researchers, mothers with anxious children do tend to employ socialization habits that affect their children's emotional and social development.

Genetics are prevalent in the literature for predicting the outcome of children of clinically-anxious parents. A meta-analysis was conducted on data from family and twin studies to determine the etiology of anxiety disorders (Hettema, Neale, & Kendler,

2001). The results largely indicated that, according to the studies, a number of anxiety disorders (e.g. panic, Obsessive-Compulsive Disorder (OCD), and phobias) were found to have significant familial aggregation. This was largely explained by genetic influences, with family environment most likely endorsing further symptomatology. Studies on both genetic and environmental factors indicate that parents may be providing both genes and environments that contribute to their offspring's behavioral and emotional development.

### 1.3 The Current Study

The objective of this study is to examine how parent anxiety levels relate to their ratings of child temperament and behavior problems. Mean gender differences were estimated for child temperament and behavior problem dimensions. We also conducted bivariate correlation analyses between child temperament, child behavior problems, and parent anxiety symptoms. We expect to see gender differences in temperament and behavior problems consistent with previous literature. Males are expected to display higher levels of temperament dimensions associated with Activity and Anger, and related Externalizing behavior problems. Whereas females are expected to display higher levels of temperament dimensions associated with Inhibitory Control and Fear, and related Internalizing behavior problems. We predicted that dimensions of child temperament and behavior problems would show significant correlations, in directions similar to prior studies' findings. For example, highly active and angry children will be rated higher in dimensions of Externalizing behavior problems; while children expressing higher levels of fear and lower levels of pleasure will be rated



higher in dimensions of Internalizing behavior problems. We also predicted that parents reporting higher levels of anxiety symptoms would perceive their children as more difficult, consistent with past literature.

## CHAPTER 2

### METHODS

#### 2.1 Participants

The sample was obtained from the Texas Family Study, an investigation of child temperament, executive functioning, and related behaviors. In addition to the child assessments, relevant parent and family variables were also measured. The sample included 201 children (51.7% male, 48.3% female) between the ages of 2.5 and 5.5 years and their parents. The mean age of the children was 3.6 years ( $SD = 1.05$ ). Families reported children's ethnicity (87.1% Not Hispanic or Latino, 12.9% Hispanic or Latino) and race (84.6% White, 4.0% Black or African American, 10.4% More than One Race, 1.0% Other Race). The average family income for participating families ranged from \$60,001-\$70,000, with the income categories ranging from \$20,001 – \$30,000 to “over \$200,000” at the highest. Parent respondents were 99% mothers. The mean age of the parent was 34.1 years ( $SD = 5.11$ ).

#### 2.2 Procedure

Families were recruited for The Texas Family Study largely through online message boards, and by flyers posted around the University of Texas at Arlington campus, as well as around the Dallas–Fort Worth metroplex in daycare centers, pediatric offices, etc. Participants had to submit an online screening to be approved for further data collection. Once approved, families provided consent and one parent

completed three sets of online questionnaires via SurveyMonkey. Among the questionnaires, parents were asked to complete an assessment of child temperament for both of their children. Families later scheduled appointments to participate in a lab visit on campus with their children. While the children were engaged in completing tasks with trained experimenters, parents were asked to fill out a child behavior problems questionnaire, along with a parent anxiety inventory. Only families that completed all surveys were included in the analyses.

#### *2.2.1. State-Trait Anxiety Inventory (STAI)*

The STAI is a 40-item self-reported questionnaire, used to diagnose clinical anxiety symptoms in adult populations (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Questions are based on a 4-point Likert scale, with 20 items assessing state anxiety and 20 items assessing trait anxiety. State Anxiety is situation-based anxiety, while Trait Anxiety refers to the general anxiety characteristic of an individual. In our sample, STAI has high internal consistency reliability ( $\alpha = .85$  for State Anxiety, and  $\alpha = .90$  for Trait Anxiety).

#### *2.2.2. Toddler Behavior Assessment Questionnaire (TBAQ)*

The TBAQ is a 120-item parent-rated instrument with 11 subscales, developed to assess temperament in young children (Goldsmith, 1996). The subscales include Object Fear, Social Fear, Pleasure, Soothability, Perceptual Sensitivity, Activity Level, Anger, Sadness, Inhibitory Control, Appropriate Attentional Allocation, and Interest. The TBAQ instructs parents to consider the frequency of behaviors they have observed during the past month as they rate their children. Questions are based on a seven-point

Likert scale, ranging from 1 (*Never*) to 7 (*Always*), with an additional option of “N/A”, if the child has not been in a certain situation in the last month. Most of the TBAQ subscales have acceptable to high internal consistency reliability in the current study, ranging from .68 to .93, consistent with previous published estimates (Goldsmith, 1996).

### *2.2.3. Child Behavior Checklist (CBCL)*

The CBCL is a 100-item parent-rated questionnaire with 12 dimensional subscales, used to assess behavior problems in young children (Achenbach & Rescorla, 2000). The subscales include Depressive Problems, Anxiety Problems, Attention Problems, Sleep Problems, Somatic Complaints, Withdrawn, Emotionally Reactive, Anxious/Depressed, Aggressive Behavior, Pervasive Developmental Problems (PDD), Attention Deficit/Hyperactivity Problems (ADHD), and Oppositional Defiant Problems (ODD). Much like the TBAQ, the CBCL uses timeline-specific questions to avoid unreliable answers from global items. Our lab used the Preschool Assessment for Ages 1.5 – 5 year olds, consistent with the age range of participants. In the current study, CBCL subscales have acceptable to high internal consistency reliability, ranging from .62 to .89. This internal consistency is similar to published estimates that range from .63 to .95 (Achenbach & Rescorla, 2000).

## 2.3 Statistical Analysis

Descriptive statistics were calculated to estimate means and standard deviations for all variables and to determine frequencies of our demographic data. While screening the data for normality and outliers, Trait Anxiety, two TBAQ subscales (Perceptual

Sensitivity and Object Fear) and seven CBCL subscales (Internalizing, Emotionally Reactive, Somatic Complaints, Withdrawn, Sleep, Affective Problems, Anxious, and PDD) were positively skewed. The skewed variables were transformed using a square root transformation to standardize the data. Mean gender differences were calculated using independent sample *t*-tests on all child variables of temperament and behavior problems. The effect size of the gender differences was calculated using Cohen's *d*. Cohen's *d* expresses group differences in standard deviation units. Bivariate correlational analyses were conducted on parent anxiety and all child temperament and behavior problem variables. Three sets of correlational analyses were conducted on: Child Behavior Problems and Child Temperament Dimensions (CBCL and TBAQ), Parent Anxiety and Child Temperament Dimensions (STAI and TBAQ), and Parent Anxiety and Child Behavior Problems (STAI and CBCL).

## CHAPTER 3

### RESULTS

#### 3.1 Gender Differences

The means and standard deviations of all parent-rated TBAQ temperament dimensions and CBCL behavior problem subscales are presented for the overall sample, males and females in Table 3.1. Overall, there were few gender differences on the TBAQ and CBCL subscales. The results of *t*-tests indicated that there were significant gender differences on the temperament dimensions of Activity Level, Object Fear, and Social Fear. Consistent with previous findings, males scored higher on Activity Level, and females scored significantly higher on both Object and Social Fear. Males also scored higher on the CBCL Attention-Deficit/Hyperactivity Problem (ADHD) subscale. The effect sizes calculated by Cohen's *d* account for 28 – 41% of a standard deviation.

Table 3.1: Sample Sizes, Means (and Standard Deviations), and Effect Sizes of Gender Differences of Temperament and Behavior Problems

	Mean (SD) <i>n</i> =201	Mean Males (SD) <i>n</i> =104	Mean Females (SD) <i>n</i> =97	Effect Size of Gender
TBAQ Activity	3.96 (.77)	4.07 (.75)	3.84 (.78)	.30*
TBAQ Attention	4.50 (.79)	4.44 (.78)	4.56 (.80)	-.15
TBAQ Interest	4.44 (.82)	4.35 (.81)	4.54 (.82)	-.23

---

TBAQ				
Perceptual Sensitivity	1.61 (.27)	1.59 (.25)	1.63 (.28)	-.15
TBAQ				
Sadness	3.68 (.86)	3.64 (.87)	3.72 (.85)	-.09
TBAQ				
Anger	3.59 (.98)	3.69 (1.00)	3.48 (.96)	.21
TBAQ				
Inhibitory Control	4.13 (.94)	4.05 (.93)	4.28 (.94)	-.25
TBAQ				
Object Fear	1.60 (.27)	1.55 (.25)	1.66 (.29)	- .41**
TBAQ				
Pleasure	5.69 (.69)	5.77 (.68)	5.60 (.68)	.25
TBAQ				
Social Fear	3.17 (1.17)	2.94 (1.11)	3.41 (1.20)	-.41**
TBAQ				
Soothability	5.12 (.81)	5.15 (.82)	5.10 (.80)	.06
CBCL				
Internalizing	2.75 (1.20)	2.71 (1.37)	2.80 (1.00)	-.08
CBCL				
Externalizing	12.93 (7.66)	13.54 (7.85)	12.29 (7.45)	.16
CBCL				
Emotionally Reactive	1.52 (.85)	1.48 (.94)	1.56 (.76)	-.09
CBCL				
Anxious/Depressed	2.86 (2.42)	2.75 (2.61)	2.97 (2.20)	-.09
CBCL				
Somatic	.95 (.86)	.98 (.90)	.91 (.82)	.08
CBCL				
Withdrawn	.94 (.78)	.90 (.80)	.99 (.75)	-.12
CBCL				
Sleep Problems	1.44 (.88)	1.43 (.81)	1.45 (.96)	-.02
CBCL				
Attention	2.60 (2.19)	2.86 (2.21)	2.32 (2.13)	.25
CBCL				
Aggression	10.29 (6.48)	10.61 (6.49)	9.95 (6.48)	.10

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CBCL Affective Problems	1.20 (.83)	1.15 (.81)	1.25 (.84)	-.12
CBCL Anxiety Problems	1.64 (.85)	1.62 (.88)	1.65 (.82)	-.04
CBCL Pervasive Developmental Problems	1.60 (.91)	1.57 (.97)	1.64 (.85)	-.08
CBCL ADHD Problems	4.58 (2.98)	4.99 (3.04)	4.15 (2.87)	.28*
CBCL ODD Problems	3.73 (2.58)	3.85 (2.55)	3.60 (2.62)	.10
STAI Trait	5.70 (.65)			
STAI State	28.42 (6.22)			

Note: Effect size estimated as Cohen's *d* express group differences in standard deviation units. \*\* $p < .01$ ; \* $p < .05$

### 3.2 Bivariate Correlations

#### *3.2.1 CBCL and TBAQ*

Tables 3.2 and 3.3 display the correlations between dimensions of temperament and behavior problems. The dimensions were significantly correlated in the expected directions. For example, children rated high in the temperament dimensions of Activity Level and Anger, and low in the dimensions of Attention, Inhibitory Control, and Soothability were found to show higher levels of nearly all behavior problem dimensions. The temperament dimensions of Social Fear and Object Fear showed strong associations with internalizing behavior problems, such as Emotionally-Reactive, Anxious/Depressed, Withdrawn, Affective Problems and Anxiety Problems, as well as



Pervasive Developmental Problems (PDD) from the externalizing domain. In addition, Object Fear was also related to other internalizing and externalizing dimensions not shared with Social Fear, such as Somatic Complaints, Aggression, Oppositional Defiance Problems (ODD), and the overall Externalizing scale. In general, the dimensions of Interest and Pleasure are negatively associated with behavior problems; however, these correlations were not consistently significant. For instance, children high in Interest are primarily showing lower levels of externalizing problems but not internalizing, with the exception of the Affective Problems scale. Also, Pleasure is associated with only a small number of subscales with modest correlations to both the internalizing and externalizing scales.

Table 3.2: Bivariate Correlations between CBCL Behavior Problems and TBAQ Temperament Dimensions

	TBAQ Activity	TBAQ Attention	TBAQ Interest	TBAQ Perceptual Sensitivity	TBAQ Sadness	TBAQ Anger
CBCL Internalizing	.28**	-.22**	-.08	.43**	.33**	.29**
CBCL Externalizing	.51**	-.47**	-.41**	.23**	.27**	.49**
CBCL Emotionally Reactive	.23**	-.16*	-.02	.35**	.30**	.30**
CBCL Anxious/Depressed	.23**	-.14*	-.05	.35**	.28**	.23**
CBCL Somatic	.22**	-.13	-.05	.28**	.18*	.13
CBCL Withdrawn	.24**	-.19**	-.13	.30**	.10	.19**

CBCL Sleep Problems	.22**	-.22**	-.19**	.09	.18*	.17*
CBCL Attention	.42**	-.47**	-.38**	.19**	.12	.21**
CBCL Aggression	.46**	-.40**	-.34**	.20**	.29**	.51**
CBCL Affective Problems	.29**	-.26**	-.22**	.23**	.24**	.24**
CBCL Anxiety Problems	.20**	-.15*	-.09	.30**	.24**	.22**
CBCL PDD Problems	.27**	-.23**	-.11	.36**	.21**	.28**
CBCL ADHD Problems	.49**	-.51**	-.48**	.14	.18*	.39**
CBCL ODD Problems	.36**	-.25**	-.20**	.19**	.26**	.41**

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

Table 3.3: Bivariate Correlations between CBCL Behavior Problems and TBAQ Temperament Dimensions

	TBAQ Inhibitory Control	TBAQ Object Fear	TBAQ Pleasure	TBAQ Social Fear	TBAQ Soothability
CBCL Internalizing	-.28**	.41**	-.19**	.32**	-.41**
CBCL Externalizing	-.53**	.19**	-.15*	.09	-.40**
CBCL Emotionally Reactive	-.27**	.37**	-.12	.23**	-.37**
CBCL Anxious/Depressed	-.19**	.43**	-.14	.37**	-.39**

CBCL Somatic	-.15*	.15*	.02	.04	-.25**
CBCL Withdrawn	-.25**	.30**	-.36**	.28**	-.22**
CBCL Sleep Problems	-.27**	.01	-.09	.05	-.23**
CBCL Attention	-.44**	.05	-.03	-.11	-.20**
CBCL Aggression	-.47**	.21**	-.16*	.13	-.41**
CBCL Affective Problems	-.28**	.19**	-.20**	.15*	-.40**
CBCL Anxiety Problems	-.22**	.46**	-.16*	.35**	-.34**
CBCL PDD Problems	-.33**	.36**	-.24**	.34**	-.30**
CBCL ADHD Problems	-.55**	.08	-.03	-.05	-.29**
CBCL ODD Problems	-.31**	.15*	-.14*	.11	-.34**

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

### 3.2.2 STAI and TBAQ

Bivariate correlations between child temperament dimensions and parent anxiety levels are shown in Table 3.4. Parent Trait Anxiety is more strongly correlated to all variables of temperament than parent State Anxiety. The variables of temperament that showed no significant correlation with either State or Trait Anxiety were Pleasure and Social Fear. There were substantially more significant associations between Trait Anxiety and temperament dimensions than State Anxiety.

Table 3.4: Bivariate Correlations between STAI Subscales and TBAQ Temperament Dimensions

	State Anxiety	Trait Anxiety
TBAQ Activity	.17*	.27**
TBAQ Attention	-.13	-.27**
TBAQ Interest	-.09	-.17*
TBAQ Perceptual Sensitivity	.10	.19**
TBAQ Sadness	.11	.33**
TBAQ Anger	.16*	.28**
TBAQ Inhibitory Control	-.11	-.29**
TBAQ Object Fear	.22*	.28**
TBAQ Pleasure	-.05	-.08
TBAQ Social Fear	.05	.14
TBAQ Soothability	-.11	-.25**

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

### 3.2.3. STAI and CBCL

Bivariate correlations between behavior problem subscales and parent anxiety levels are presented in Table 3.5. Parent anxiety were found to be significantly

associated to multiple behavior problem dimensions. Similar to the findings on child temperament, associations were strong for Trait Anxiety and behavior problems. Both State and Trait Anxiety were related to the dimensions of Internalizing, Externalizing, Emotionally Reactive, Anxious/Depressed, Aggression, Anxiety Problems, and PDD. In addition, trait was significantly associated with Somatic, Sleep, Affective, and ODD Problems.

Table 3.5: Bivariate Correlations between STAI Subscales and CBCL Questionnaire Dimensions

	State Anxiety	Trait Anxiety
CBCL Internalizing	.16*	.24**
CBCL Externalizing	.16*	.22**
CBCL Emotionally Reactive	.19**	.23**
CBCL Anxious/Depressed	.15*	.22**
CBCL Somatic	.10	.17*
CBCL Withdrawn	.01	.12
CBCL Sleep Problems	.05	.15*
CBCL Attention	.06	.07
CBCL Aggression	.17*	.24**
CBCL Affective Problems	.11	.27**

CBCL Anxiety Problems	.20**	.22**
CBCL PDD Problems	.15*	.21**
CBCL ADHD Problems	.06	.12
CBCL ODD Problems	.12	.19**

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

## CHAPTER 4

### DISCUSSION

This study examined the relationship between parent anxiety levels and dimensions of child temperament and behavior problems. Parent ratings on the TBAQ and CBCL were employed in this study, along with self-assessments of their anxiety symptoms on the STAI. Mean gender differences were observed in temperament and behavior problems. Temperament and behavior problems dimensions were related in the expected directions. Parents' anxiety levels were found to be significantly associated with multiple variables of child outcomes.

Gender differences were noted in four dimensions of temperament and behavior problems. The differences were noted in three temperament dimensions: Activity Level, Object Fear and Social Fear; and one behavior problem subscale: ADHD Problems. Females were rated higher in Object and Social Fear than males, who were rated higher in Activity and ADHD Problems. While the findings were consistent with previous literature (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Martin, Wisenbaker, Baker, & Huttenen, 1997), the sample did not exhibit gender differences in the temperament dimension of Inhibitory Control. Prior research has suggested that females would demonstrate higher levels of Inhibitory Control than males (Gagne, Miller, & Goldsmith, 2013). However, a prior study using this sample conducted by Gagne, Spann, and Prater (2013), ran complex analyses to account for developmental

differences due to age and gender. They found that older age was linked to increased levels of Inhibitory Control, but a similar relationship was not found with gender. Our findings were consistent with previous studies that showed that older children are better at controlling impulsivity than younger children (Williams, Ponesse, Schachar, Logan, & Tannock, 1999).

Our findings showed that temperament and behavior problems were associated in patterns similar to previous literature (Bates, Maslin, & Frankel, 1985; Caspi, Henry, McGee, Moffitt, & Silva, 1995). Our prediction that children higher in fear would be higher in Internalizing problems was supported by the results. However, there was a discrepancy between the two temperament dimensions of fear. Interestingly, Object Fear was more strongly associated with several subscales of Externalizing behavior problems. Further analyses would need to be conducted in order to understand this difference. Contrary to our prediction that children rated higher in activity and anger would also be rated higher in Externalizing behavior problems alone, we found that those children were rated higher on all behavior problem domains. This finding could be due to the fact that parents who perceive their children as more hyperactive and aggressive view their children as more 'difficult' in temperament. Overall, the association between child temperament and early behavior problems indicate that temperament dimensions may be predictive of later behavior problems. This is an important relationship that emphasizes the need for the development of early intervention techniques to prevent behavior maladjustments in later childhood.



Parent Trait Anxiety was related to more temperament and behavior problem dimensions than State Anxiety. This suggests that parents who experience higher levels of anxiety on a day-to-day basis may have a more persistent negative outlook on their child's behaviors and emotions (Burstein, Ginsburg, & Tein, 2010). For example, we found that parents with higher levels of anxiety tend to rate their children higher in Anxiety Problems. This finding was consistent with the existing literature (Austin, Hadzi-Pavlovic, Leader, Saint, & Parker, 2005; Biederman et al., 2006; Hastings et al., 2010). This may indicate that parent's perceptions of their children are influenced by their own anxiety symptoms. Higher levels of parent anxiety have also been shown to affect parenting style in that it becomes more controlling and less responsive toward their children (Van der Bruggen, Stams, & Bögels, 2008). Further research would need to be conducted in order to examine the effects of parent anxiety symptoms on parent-child interactions.

#### 4.1 Limitations and Future Directions

As with all research, there were limitations to this study. For instance, the sample's demographics were not quite as representative of the diversity present in the DFW area. Participants in the study were primarily White/Caucasian (84.6%), whereas the US Census Bureau (2012) recently reported that White/Caucasians make up 76.2% of Tarrant County. Also, the majority of the participating families were higher in socioeconomic status (SES) than the average household in the DFW metroplex. A more diverse sample would most likely increase the generalizability of the findings to various populations.

Another limitation would be that only self-reported parent anxiety symptoms were taken into account in this study. If parents exaggerated or otherwise understated their answers on the anxiety inventory, the validity of the parent's self-assessment may become problematic. An investigation into clinically anxious parents and child variables may provide stronger correlations with directions consistent with the current study's findings (Hettema, Neale, & Kendler, 2001).

In the present study, only parent-ratings were used in the analyses of child temperament and behavior problems. Parents' ratings of their children are subjective, and thus susceptible to rater-biases. Parent ratings can also be negatively affected by their mental health (Mertesacker, Bade, Haverkock, & Pauli-Pott, 2004). To counter this limitation, objective lab measures of child temperament and behavior problems should be employed in future studies. Currently, the Texas Family Study lab is in the process of coding videos of children's behavioral and emotional data, recorded during lab-visit episodes. In future lab studies it would be beneficial to compare the objective ratings of child temperament and behavior problems to the parent ratings to gauge the level of agreement between the ratings.

There is substantial research to suggest that temperament is associated with gender (Gagne, Miller, & Goldsmith, 2013) and age (Miner & Clarke-Stewart, 2008). The age range of our sample was encompassing of different developmental milestones, so older children may have scored higher in Inhibitory Control, as opposed to the younger children that have not yet fully developed the ability to control impulse

behaviors (Gagne, Spann, & Prate, 2013). Future research should also include more analyses that account for age and gender-related differences.

In the present study, parent behavior was significantly related to our child outcomes, but we have no way of knowing if genetics or environment is implicated. Another future direction for the Texas Family Study lab would be to analyze participant's DNA to conduct association studies with behavioral outcomes like child temperament and behavior problems. During our lab-visits, experimenters swab the inside of children's mouths with a cotton bud to collect saliva, an amount of which was stored in individually labeled vials. The next step would be to have the DNA sample analyzed, and compare those results to ratings of child temperament to measure overall agreement.

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Filza Khan graduated from the University of Texas at Arlington in 2014 with an Honors Degree for the Bachelors of Science in Psychology with a minor in Developmental Psychology. Her activities during her undergraduate career include being a member of the National Society of Collegiate Scholars, in which she held the Vice Presidency of Community Service for two years (2012-14). The organization was awarded the Outstanding Student Organization of the Year (2013-2014) by UTA's Student Organization Award. She will go on to get her Masters in Professional Counseling at Texas Wesleyan University.