Title
Parental Intrusiveness and Separation Anxiety in Children with High Functioning Autism: Associations and Changes Due to Cognitive Behavioral Therapy

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Parental Intrusiveness and Separation Anxiety in Children with High Functioning Autism:
Associations and Changes Due to Cognitive Behavioral Therapy

A thesis submitted in partial satisfaction
of the requirements for the degree Master of Arts
in Education

by

Cori Jo Yoshiko Fujii

2014
ABSTRACT OF THE THESIS

Parental Intrusiveness and Separation Anxiety in Children with High Functioning Autism: Associations and Changes Due to Cognitive Behavioral Therapy

by

Cori Jo Yoshiko Fujii

Master of Arts in Education
University of California, Los Angeles, 2014
Professor Jeffrey J. Wood, Chair

Autism spectrum disorders (ASD) have been identified in approximately one out of 68 children, with many individuals experiencing increased levels of anxiety (Bellini, 2004; CDC, 2014; Kuusikko et al., 2008). One factor associated with anxiety in neurotypical children and adolescents is an intrusive parenting style. The study sought to examine the relationship between parental intrusiveness (PI) and separation anxiety in children with high-functioning autism (HFA) as well as whether changes in PI over the course of a cognitive behavioral therapy (CBT) for anxiety predict child separation anxiety severity post-treatment. Analyses were conducted for 36 children (27 male), aged seven to 11, in the greater Los Angeles area. Correlational analyses revealed a significant relationship between parent-reported PI and independently rated child separation anxiety severity. In addition, changes in PI predicted separation anxiety severity
post-treatment. These findings illuminate a potential agent of change in separation anxiety severity for children with HFA.
The thesis of Cori Jo Yoshiko Fujii is approved.

Carolle Howes

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Jeffrey J. Wood, Committee Chair

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2014
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>2. Methods</td>
<td>10</td>
</tr>
<tr>
<td>3. Results</td>
<td>14</td>
</tr>
<tr>
<td>4. Discussion</td>
<td>16</td>
</tr>
<tr>
<td>5. Tables</td>
<td>21</td>
</tr>
<tr>
<td>6. References</td>
<td>24</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

The current study looks at whether parental intrusiveness is associated with anxiety disorders in children with high-functioning autism (HFA). Because children with comorbid HFA and anxiety are more likely to have social and behavioral problems when compared with children with HFA but no anxiety, it is important to understand factors that may buffer the development of anxiety disorders within this population (de Bruin, Ferdinand, Meester, de Nijs, & Verheij, 2007; Klin, Pauls, Schultz, & Volkmar, 2005; Muris, Steerneman, Merckelbach, Holdrinet, & Meesters, 1998). More specifically, this study looks at whether the relationship between parental intrusiveness (PI) and separation anxiety in particular is similar to the relationship previously seen in typically developing children. Finally, this study examines whether changes in level of PI after a 16-week family-based cognitive behavioral therapy (CBT) for children with HFA and anxiety has an effect on child separation anxiety severity.

High Functioning Autism

Autism spectrum disorders (ASD) is estimated to affect approximately one out of 68 individuals (CDC, 2014). Autism is a developmental disability that persists across the lifespan and causes deficits in an individual’s social and communication skills. Although a formal definition of HFA is not agreed upon, individuals labeled as high functioning are typically characterized by deficits in social and communication skills, and generally have relatively higher IQ scores (Filipek et al., 1999; Ozonoff, South, & Miller, 2000). Unlike individuals with autism that are functioning at a lower cognitive level, these individuals are typically socially integrated in society, interacting with the larger social and cultural environment.
The treatment and services provided to support individuals with autism put a strain on the medical, mental health, social service, and educational communities. There is a substantial financial burden placed on these systems and society at large to provide appropriate services to these individuals. It can cost about $3.2 million to take care of a person with autism over his or her lifetime. In addition, caring for all people with autism over their lifetimes is estimated to cost $35 billion per year (Ganz, 2006; Jarbrink & Knapp, 2001; Newschaffer & Curran, 2003; Shimabukuro, Grosse, & Rice, 2008). These cost estimates are based on an analysis of the direct and indirect medical costs associated with the disorder (Ganz, 2006). However, this $35 billion annual societal cost for caring for and treating people with autism is likely an underestimate of the true costs because there are a number of other services that are used to support individuals with autism, such as alternative therapies and other family out-of-pocket expenses, that are difficult to measure. For individuals with HFA, support services are typically aimed at enhancing social interactions and decreasing behavioral problems as compared with children that have autism but are lower functioning (Matson, Matson, & Rivet, 2007; Rao, Beidel, & Murray, 2008). Many interventions for individuals with HFA teach skills that can be applied in real-world settings, with the aim that the skills learned can be adapted and applied as the individual ages (Bass & Mullick, 2007; Cragar & Horvath, 2003; Kalyva & Avramidis 2005). Therefore, they are thought of as a relatively low lifetime cost, with interventions lasting several weeks to months but with hopefully continuing results. However, not all interventions are long-lasting making it imperative to find factors that may lead to more long-term results, thus lower lifetime costs for interventions for individuals with HFA.

The burden of assisting these individuals does not lie solely with public services; many times the bulk of the burden is placed on the family and a close circle of individuals connected
with the child with HFA. Parents of children with HFA are often faced with challenges that parents of neurotypical children or children with other disabilities do not face. One challenge is that interventions for these individuals start early on and can be extremely intensive and demanding of parents and their families. Many common interventions show the most lasting functional improvements at younger versus older ages (Fenske, Zalenski, Krantz, & McClannahan, 1985; Kasari, 2002; Lovaas & Smith, 2003). In addition, many parents place their children in multiple interventions over their course of development (Goin-Kochel, Myers, & Mackintosh, 2007; Green et al., 2006; Thomas, Morrissey, & McLaurin, 2007). As a result of the great amount of time and effort put into these interventions, parents often experience more stress when faced with the challenge of raising a child with HFA. Previous studies have shown that these parents have extremely elevated levels of stress, with levels comparable with parents of children with other developmental disabilities such as mental retardation and Down Syndrome and cerebral palsy (Blacher & McIntyre, 2006; Eisenhower, Baker & Blacher, 2005; Kasari & Sigman, 1997; Sanders & Morgan, 1997) as well as severe chronic physical disabilities such as cystic fibrosis (Bouma & Schweitzer, 1990). When children with HFA have a comorbid psychological disorder, parenting stress levels are elevated even further. These parents are particularly at risk for developing a psychological disorder themselves, and understanding ways to decrease psychopathology in children with HFA could possibly have positive effects on the mental health of their parents. Understanding factors that influence the development of children with HFA will help in guiding prevention and intervention programs that aim to support positive social interactions with others, thus ameliorating the burden placed on families and society in general.

Comorbidity of High-Functioning Autism and Anxiety Disorders
Internalizing disorders, anxiety disorders in particular, are often seen in individuals with an intellectual disability. There is some evidence that rates of anxiety disorders among this population may be higher than in the general population, however, it is often difficult to diagnose due to various cognitive and developmental delays. Because individuals with HFA do not have the cognitive and language delays associated with other developmental delays, it is somewhat easier to diagnose anxiety disorders among this population. Previous studies have found that adolescents with HFA reported levels of anxiety that were significantly higher than the mean normative sample, with nearly 50% scoring above the level of high social anxiety on one measure of social anxiety (Bellini, 2004; Kim, Szatmari, Bryson, Streiner, & Wilson, 2000). Studies have also found that children with Asperger Syndrome (a form of autism similar to high-functioning autism) had a higher representation of obsessions and anxiety, even when compared with other children with disabilities (Green, Gilchrist, Buton, & Cox, 2000; Szatmari, Bartolucci, & Bremner, 1989). Kuusikko et al. (2008) found that children and adolescents with HFA may experience significantly more social anxiety symptoms compared with their neurotypical peers, and this anxiety does not decrease as they get older, something often seen in neurotypical children. Overall, the literature shows that anxiety is reported at a somewhat higher level in individuals with HFA compared with other populations, and that although symptoms may be similar to those of the core autism deficits (specifically social isolation and lack of social motivation), it is a distinct disorder within this population and carries with it additional difficulties in need of addressing in targeted treatments for these individuals (Gillott, Furniss, & Walter, 2001).

Parenting and Anxiety
Parenting style has previously been associated with children’s psychological functioning. One style of parenting that previous research has highlighted as related to children’s mental health is the level of intrusive or controlling behavior the parent exhibits to the child. More specifically, previous research studies have demonstrated that this overbearing parenting style is associated with internalizing disorders, specifically anxiety disorders, in neurotypical children as well as children with intellectual disabilities (Bogels & Brechman-Toussaint, 2006; Chorpita & Barlow, 1998; Hudson & Rapee, 2001; van Gastel, Legerstee, & Ferdinand, 2009; Vasey & Dadds, 2001; Wood, McLeod, Sigman, Hwang, & Chu, 2003) While there are many different labels used to describe this overbearing quality (i.e. controlling, over-involved, protective, etc.), the current study will use the term, “parental intrusiveness,” to refer to this parenting style. The definition of parental intrusiveness used in this study comes from Wood (2006b), who defines the term as a parent’s tendency to, “take over tasks that children are (or could be) doing independently and impose an immature level of functioning on their children, restricting children’s autonomy.” While there have been several studies examining this relationship in various populations, no previous study has examined this relationship among parents and their children with HFA. It is plausible that the relationship would differ among this specific and unique population of individuals with both a developmental disability and a psychological disorder, it seems more likely that this relationship would mirror relationships previously studied in various other populations. Previous interventions for parents of neurotypical children have been adapted for parents of children with intellectual disabilities, with positive outcomes similar in both groups (McIntyre, 2008; Roberts, Mazzucchelli, Studman, & Sanders, 2006; Wood, Drahota, Sze, Har et al., 2009). Therefore, it is hypothesized that parental intrusiveness in children with high functioning ASD will follow a similar pattern. That is, parental intrusion in
children with HFA will be associated with heightened anxiety. If the association between parental intrusiveness and anxiety disorders is seen in this population, it would inform prevention and intervention programs aimed at this specific population.

**Parental Intrusiveness and Separation Anxiety Disorder**

Wood (2006b) found that his measures of parental intrusiveness from multiple raters were associated specifically with separation anxiety in children with a diagnosed anxiety disorder. His work suggests that parental intrusiveness may have a unique contribution and association with separation anxiety when compared to various other anxiety disorders. In addition, several studies have found that over-involved/protective parenting predicted early internalizing difficulties in young children, with this relationship extending into middle childhood for these children. When comparing parenting styles in children, children with anxiety were differentiated from those without by categorizing parents with and without over-involved/protective parenting styles (Bayer, Sanson, & Hemphill, 2006; Ginsburg, Grover, & Ialongo, 2004; Hudson & Rapee, 2001). This research suggests that parental intrusiveness is closely related to anxiety in children. However, little research has been done on the relationship between parental intrusiveness and anxiety in children with developmental disabilities, specifically children with HFA.

Cognitive behavior therapy is considered the gold standard for treating anxiety disorders in neurotypical children (Kendall, 1994). Research on the efficacy of CBT for children with HFA has shown the positive effects of CBT for this population, with research studies spanning from case studies to randomized clinical trials (RCTs; e.g., Chalfant, Rapee, & Carroll, 2007; Reaven, Blakely-Smith, Culhane-Shelburne, & Hepburn, 2012; Sung et al., 2011; Wood, Drahota, Sze, Har et al., 2009). A number of traditional and modified CBT elements for anxiety
management have been applied to treat youth with ASD such as skill building to identify anxious thoughts and physical manifestations of anxiety, develop coping skills, and gradually approach anxiety provoking situations (i.e., graded exposure). In an attempt to meet the needs of children and adolescents with ASD, CBT has been adapted to better suit the learning styles of youth with ASD. The adaptations have primarily focused on facilitating the uptake of anxiety management principles and skills by altering the manner in which materials are presented, such as the use of visual aids. The current study draws upon a larger randomized controlled trial of CBT for children with HFA (Sze & Wood, 2008; Wood, Drahota, Sze, Har et al., 2009; Wood, Drahota, Sze, Van Dyke et al., 2009). Due to the family-based nature of the current RCT, a strong emphasis is placed upon teaching parents to support their child with coping with anxiety through parenting techniques that focus on allowing children to struggle with somewhat difficult situations with the support and encouragement of their parents. As this directly addresses the level of intrusiveness of parents by encouraging them to allow their children to attempt various tasks independently, it is hypothesized that levels of parental intrusiveness would decrease over the course of treatment. In addition, due to the previously proven relationship between parental intrusiveness and separation anxiety, this change in parental intrusiveness is examined as a potential mechanism by which changes in SA severity occur (Wood, 2006b). The current study seeks to examine whether the link between parenting styles and anxiety is comparable for children with HFA as it is for neurotypical children. Additionally, if changes in parental intrusiveness is seen to be related to changes in child separation anxiety severity, future interventions could work to change that particular parenting style for better child outcomes. The burden on families and public services would be greatly reduced by preventing or reducing anxiety in children with HFA before it becomes a major debilitating problem. Understanding the
factors that influence the development of anxiety in these children is germane to the development of successful intervention and prevention programs for this population.

**Current Aims**

Because children with HFA seem to have a greater risk of developing an anxiety disorder compared to their neurotypically developing peers (Chalfant et al., 2007), the current study aims to further examine the factors that may be associated with anxiety in these individuals. In addition, few studies have looked at the interactions between children and their parents as a way to better understand how parenting may play a role in exacerbating or ameliorating anxiety symptoms for children with HFA and anxiety. Discovering parenting factors that influence the development of anxiety in these children with HFA can help to formulate prevention and intervention programs for these children. In addition, this study aims to investigate whether decreases in parental intrusiveness as a result of a CBT intervention leads to decreases in separation anxiety severity.

**Aim 1:** Examine the relationship between parental intrusiveness and separation anxiety severity of children with HFA.

**Research Question 1:** Are parent- and child- reported levels of intrusiveness related to independently rated levels of separation anxiety in children with HFA?

**Hypothesis 1:** Parent- and child- reported levels of intrusiveness will be positively related to independently rated levels of separation anxiety in children with HFA, where higher levels of PI will be related with higher levels of separation anxiety severity.
**Aim 2:** Examine the relationship between changes in level of parental intrusiveness as the result of a family-based randomized controlled trial of CBT for children with HFA and anxiety.

**Research Question 2a:** Are changes in parent- and child-reported levels of parental intrusiveness related to independently rated levels of separation anxiety in children with HFA after participating in a family-based randomized controlled trial of CBT for children with HFA and anxiety?

*Hypothesis 2a:* Changes in parent- and child-reported levels of parental intrusiveness will be related to independently rated levels of separation anxiety in children with HFA after participating in CBT, with more positive changes in parental intrusiveness related to decreased separation anxiety severity post-treatment.

**Research Question 2b:** Do changes in parent- and child-reported levels of parental intrusiveness predict changes in independently rated levels of separation anxiety in children with HFA after participating in a family-based randomized controlled trial of CBT for children with HFA and anxiety?

*Hypothesis 2b:* Changes in parent- and child-reported levels of parental intrusiveness will predict independently rated levels of separation anxiety in children with HFA after participating in CBT, with more positive changes in parental intrusiveness related to separation anxiety severity post-treatment.
CHAPTER 2: METHOD

Participants

The current sample included 36 children (27 male) ages 7 to 11 diagnosed with HFA or Asperger’s Disorder and at least one co-occurring anxiety disorder in the greater Los Angeles area. The majority of participants were male due to the preponderance of males diagnosed with autism in the general population. Table 1 provides all relevant demographic information of the current sample. The mean age of the participants was 9.28 years (SD = 1.3), the sample contained 50% Caucasian, 65.7% of mothers graduated from college or higher, and the median gross family income was over $80,000 a year. All interviews were performed at UCLA in a private individual room in the building housing the Graduate School of Education. All families received $20 for participating in the assessments. All measures and procedures were conducted in accordance with the UCLA Institutional Review Board.

Children with ASD and anxiety or shyness were referred by a medical center-based autism clinic, regional centers, parent support groups, and school personnel such as inclusion specialists for cognitive behavioral treatment for anxiety adapted for children with ASD. Children who met research criteria for ASD and at least one anxiety disorder were initially included in the study. Psychiatric medication, if used, was at a stable dose prior to intake and throughout the duration of the trial. Children with verbal IQs less than 70 or who were in concurrent psychotherapy were excluded. ASD diagnoses were assigned with an algorithm using the Autism Diagnosis Interview-Revised (ADI-R; Le Couteur, Lord, & Rutter, 2003), Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, diLavore, & Risi, 2002)—Module 3, a checklist regarding circumscribed interests, and a review of previous assessment
records. All children were diagnosed using the Anxiety Disorders Interview Schedule (ADIS) with regards to four different anxiety disorders diagnoses (separation anxiety, social phobia, generalized anxiety, and obsessive-compulsive disorder). The ADI-R, ADOS, and ADIS were administered by doctoral students and doctoral-level psychologists who received standardized training and assessment certification. Participants were randomized to two conditions, either receiving treatment immediately or after a 16-week waiting period. Participants were given 16 weekly sessions of CBT for treatment of anxiety, with all treatment sessions taking place at UCLA. Detailed descriptions of the intervention can be found elsewhere (Sze & Wood, 2008; Wood, Drahota, Sze, Har et al., 2009; Wood, Drahota, Sze, Van Dyke, et al., 2009). Data used in the current study were taken from those in the immediate treatment condition only due to the limited number of participants with complete data in the waitlist condition.

One unique aspect of the current CBT program is the emphasis placed upon increasing the child’s level of independence, particularly with regards to self-help skills. Due to the relatively lower levels of self-help skills seen in children with autism as well as the relationship between those skills and anxiety disorders, much of the CBT program emphasizes teaching children to become independent while simultaneous encouraging parents to support their children in their struggle to master this area of development (Baghdadli et al., 2012; Drahota, Sterling, Hwang, & Wood, 2013; Jonsdottir et al., 2007). Because CBT has shown to make significant changes in the child’s level of independent living skills for children with HFA, one could assume that significant changes could also be made in levels of PI, a parenting style closely linked with child independence levels. While not a primary outcome of the CBT study, many of the techniques used within the CBT study to decrease and manage levels of anxiety in
children with HFA, such as increasing coping skills in difficult situation and encouragement to complete tasks independently, could lead to decreases in parental intrusiveness.

**Procedures**

Phone contact was initiated by parents referred for inclusion in a randomized controlled trial of a family-centered cognitive behavioral treatment (CBT) intervention study for children with high-functioning autism and comorbid anxiety. Parents gave written informed consent and children gave written assent to participate in the study. Data for the current study was taken from assessments completed with participants at intake and at treatment completion. All interview assessments were conducted by trained graduate and post-doctoral students blind to the treatment condition.

**Measures**

**Autism Diagnosis Measures**

*Autism Diagnostic Interview – Revised (ADI-R; Le Couteur et al. 2003).* The ADI-R is a standardized parent interviewed aimed at obtaining detailed descriptions of child behaviors associated with the diagnostic criteria for autism. The focus of the interview is on the three main areas affected by autism: reciprocal social interaction, communication and language, and repetitive, restricted and stereotyped behaviors.

*Autism Diagnostic Observation Schedule (ADOS; Lord et al. 2002).* The ADOS is a semi-structured child interview assessing the child’s level of social and communication functioning. The interviewer provides a variety of social presses to elicit certain behaviors relevant to the diagnosis of autism. The current study used Module 3, designed to be used with individuals who are verbally fluent.

**Anxiety Measure**
Anxiety Disorders Interview Schedule – Child and Parent (ADIS C/P; Silverman & Albano, 1996). The ADIS is a semi-structured interview done separately with the child and parent in order to assess the child’s level of anxiety with regard to several different anxiety disorders. The ADIS has very favorable psychometric properties with the independent evaluator (IE) generating a Clinician’s Severity Rating (CSR) score ranging from zero to eight (with higher scores representing more anxiety) for each anxiety disorder diagnosis. Ratings of four or higher signify clinically significant levels of anxiety.

Parental Intrusiveness Measure

Parent-Child Interaction Questionnaire (PCIQ; Wood, 2006b). The PCIQ is a parent- and child-report comprised of eight items focusing on concrete parent-child interactions that occurred during the previous week. Items focus on parents providing help with private daily routines that most school-age children without physical disabilities are capable of performing independently (e.g. dressing, bathing), intrusions on personal space, and infantilizing behavior (e.g. using baby words). Previous studies have shown good reliability and validity of the measure (Wood et al., 2007; .71 and .73 for parent- and child-report respectively), with the current study showing similarly good levels of reliability (Cronbach’s alphas: .76 for parents and .73 for children).
CHAPTER 3: RESULTS

To address the first research question as to the relationship between parent- and child-reported levels of PI and independent evaluator’s ratings of child separation anxiety severity, correlational analyses were conducted. Table 2 provides the results of all correlation analyses as well as means and standard deviations of the study variables. Correlational analyses showed that only parent-reported PI was significantly related to IE ratings of separation anxiety severity ($r = .309$, $p < .05$). Because child-report measures of PI were not statistically significantly related to separation anxiety severity at any timepoint, they were excluded from subsequent regression equations.

With regards to the second study aim, correlational analyses were conducted to examine the relationship between post-treatment IE-rated separation anxiety severity and PI. In order to examine how a change in PI could affect separation anxiety severity after treatment, change scores were calculated for parent- and child-rated PI. Change scores were calculated for each participant by subtracting post-treatment scores from intake scores. Thus, a positive change score would indicate a decrease in PI from intake to post-treatment and a negative change score would indicate an increase in PI from intake to post-treatment. Additional correlational analyses using change scores revealed the only statistically significant variable associated with IE’s ratings of child separation anxiety severity at post-treatment was the change in parent-reported levels of PI from intake to post-treatment ($r = -.328$, $p < .05$). This correlation indicated that when there were greater decreases in PI from intake to post-treatment (a larger, positive score indicating lower scores at post-treatment compared with intake), post-treatment IE-rated separation anxiety severity was lower.
In order to address the final research question, a hierarchical regression was conducted to determine whether a change in parent-rated PI predicted separation anxiety severity at post-treatment. Table 3 provides information from the regression analysis. Because IE-rated separation anxiety severity at intake and post-treatment were significantly related \((r = .386, p < .05)\), intake separation anxiety severity was controlled for in the hierarchical regression. Parent-rated change in PI was the only significantly related variable to post-treatment separation anxiety severity, therefore it was the sole predictor used in the regression. No other variables were associated with IE-rated separation anxiety at post-treatment and therefore were left out of the regression analysis. Parent-rated changes in PI from intake to post-treatment significantly predicted IE-rated post-treatment separation anxiety severity \((F(2, 32) = 5.711, p < .01)\), with greater decreases in PI from intake to post-treatment predicting lower separation anxiety severity scores at post-treatment. Despite the fact that intake separation anxiety significantly predicted post-treatment severity \((t = 2.75, p < .05)\), the amount of change in PI significantly predicted post-treatment separation anxiety severity. More than a quarter of the variance in post-treatment SA severity was explained by intake separation anxiety severity and the amount of change in parent-reported PI from intake to post-treatment \((R^2 = .263)\). Finally, a significant amount of variance was explained by parent-rated change in PI above and beyond the influence of separation anxiety severity at intake \((R^2 \text{ change} = .105, p < .05)\).
CHAPTER 4: DISCUSSION

Given the fact that anxiety is a prevalent problem for children with high-functioning autism, finding predictors of this problem is highly relevant. Expanding on previous research on parental intrusiveness and separation anxiety severity in typical populations, the current study looked to discover if the relationship held within a population of youth with high-functioning autism. In addition, this study sought to examine if a change in level of parental intrusiveness due to participation in CBT would predict child separation anxiety severity at the end of treatment. By better understanding the key elements of an intervention program, future researchers and practitioners will be able to focus their treatments on those factors most influential to child outcomes.

Results confirmed previous findings that child separation anxiety is associated with parental intrusiveness in a population of children with high-functioning autism (Bayer et al., 2006; Ginsburg et al., 2004; Hudson & Rapee, 2001). Further, our study added on previous findings by investigating this unique relationship for children with high functioning autism. Child- and parent-report on measures were highly correlated indicating that both children with high-functioning autism and their parents seem to perceive the parent’s level of intrusiveness in a similar way, something that previous researchers have not always found (Wood, Drahota, Sze, Har et al., 2009). While parents and children tended to rate similarly with regards to the amount of PI, only parent-reported PI was related to IE-rated anxiety at intake and post-treatment. Parent- and child-rated PI were highly correlated with each other at intake and post-treatment (rs = .631 and .633, respectively), but child-reported PI failed to be significantly correlated with independent ratings of child anxiety at any timepoint. However, because parent- and child-
reported PI were not perfectly correlated, there is still a lot of variance unexplained between the two ratings. Future studies should look to examine why parent- but not child-reported PI is related child anxiety, and whether this is the result of some yet unmeasured variable, or the result of somewhat less reliable reporting of children.

While the findings from this study echo those from other studies with regards to the relationship between PI and separation anxiety severity in children with HFA, the current study also examined how changes in level of intrusiveness affected child separation anxiety after participation in a family-based CBT intervention. Results showed that when parents rated themselves as less intrusive after the intervention, this predicted lower levels of separation anxiety in their child. This points to a possible mechanism of change in the severity of child separation anxiety for children with autism. This finding is in line with previous research in neurotypical children that showed that changes in anxiety due to participation in a CBT program were mediated by changes in parental intrusiveness that persist one year after program completion (Wood, McLeod, Piacentini, & Sigman, 2009). While Wood and colleagues found these results in adolescents, these findings are of significance for the current population due to the higher rate of SA found in younger compared with adolescents. They found these changes only for families randomized to a family-based CBT program compared with a child-based CBT program. Similar findings in the current study could be due to the family-based CBT treatment similar to the one used by Wood and colleagues.

**Implications and Limitations**

Previous studies have shown that rates of anxiety disorders among individuals with autism is somewhat higher than other populations, and that while there may be certain symptom overlap with the core deficits of autism itself, anxiety disorders among this population is in fact a
distinct disorder carrying with it additional difficulties for the individual with autism as well as his or her caregivers (Gillott et al. 2001). Prevention and intervention programs for children with high-functioning autism would benefit from understanding factors that may buffer or exacerbate the onset and severity of anxiety disorders within this population.

One possible factor influencing the presence and severity of anxiety disorders among children with high-functioning autism is parenting style. Previous research has shown that an overbearing parenting style, characterized by high levels of intrusiveness, is associated with internalizing disorders, particularly separation anxiety disorder (Chorpita & Barlow, 1998; Hudson & Rapee, 2001; Vasey & Dadds, 2001; Wood, 2006b). The current study along with previous research findings has demonstrated the association between parental intrusiveness and anxiety disorders in children with HFA. As a result, researchers should use this association to develop effective programs to prevent or treat separation anxiety in these children by focusing on altering parenting style, particularly with regards to their level of intrusiveness. Separation anxiety has previously been shown to be associated with lower parenting self-efficacy and satisfaction as well as higher levels of dysfunctional parental beliefs (e.g. catastrophizing, lack of control, dangerous outside world, etc.), with reductions leading to greater school performance and social adjustment (Herren, In-Albon, & Schneider, 2013; Wood, 2006a).

By allowing children to complete tasks that they are physically capable of doing and supporting their struggle to learn new skills, parents are not only helping their child gain independence, they could possibly be preventing separation anxiety. Interventions should take into account how a child’s limitations on their independence, through parental intrusiveness, can negatively affect them with regards to their level of anxiety, specifically separation anxiety. Including a module or lesson that assists children in developing their adaptive behaviors as well
as teaches parents the importance of supporting their child’s independence could lead to more significant outcomes for prevention or intervention studies for childhood anxiety. Hence, interventions that do not solely focus on the child’s deficits, but also focus on changing parents’ behaviors with their children may yield greater benefits than interventions excluding this component. By understanding how parent and child factors influence each other within this population to impact child well-being, specifically the child’s anxiety disorder severity, targeted prevention and intervention programs will have a better understanding on how to tackle treating children with high-functioning autism and comorbid anxiety disorders.

One limitation to the current study is the lack of diversity in terms of race and family socio-economic status as measured through maternal education and gross family income. It is difficult to draw broad conclusions regarding the relationships between parental intrusiveness, adaptive behaviors and child separation anxiety for children with HFA because this sample is vastly different from the general population. Future studies should strive to include a more diverse population in order to examine this phenomenon across racial and ethnic groups as well as social class. Further examination into which subgroups of children with HFA and anxiety are affected most by this parenting style and adaptive behavior would assist in tailoring intervention programs to give the greatest impact by targeting these specific groups.

The current study is also limited to a small sample size, all of whom participated in a family-based CBT program. Due to the limited number of participants with completed data from the larger randomized control trial, analyses could not be computed comparing children receiving CBT and those on a waitlist or using some alternative intervention method (a la Wood, McLeod et al., 2009). Without a suitable control group with whom to compare, the results cannot be attributed solely to the CBT program; changes in parental intrusiveness and anxiety
could be due to maturation or some yet unmeasured variable. In addition, various other parenting methods as well as child coping skills were taught throughout the 16-week intervention, therefore it is difficult to isolate whether anxiety changes were due to changes in PI or because of some other skill learned during treatment.

Finally, in order to determine the mechanism and timing of changes in PI and its impact on child separation anxiety, multiple measurements of both should be taken throughout the CBT program. Multiple measures made consistently throughout treatment would allow for the mapping of trajectories of child ASD. The comparison of these trajectories between a treatment and a control group would further illuminate the process by which PI changes impact child separation anxiety. Multiple measurements of PI, such as previously used observational measures, should also be employed throughout treatment to gain an objective assessment of this parenting style. Because of the potential of social desirability bias in parent-report measures, particularly with regards to an area of parenting specifically focused upon during treatment, having another measure by independent raters on PI would greatly enhance the findings of any relationship between PI and separation anxiety found in future studies.

In conclusion, the findings from the current study point to an area of parenting that seems to impact separation anxiety in children with HFA. In addition, PI seems to be malleable enough in that changes were detected after a 16-week family-based CBT program. Associations between PI and separation anxiety were significant and decreases in PI were able to predict lower separation anxiety after treatment. While additional research needs to be conducted to further examine this mechanism, this seems to be a potential and promising active ingredient in family-based CBT for the amelioration of separation anxiety in children with HFA.
### Table 1

**Demographic Information**

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</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td>27 (75)</td>
</tr>
<tr>
<td><strong>Mean Child Age (SD)</strong></td>
<td>9.28 (1.3)</td>
</tr>
</tbody>
</table>

**Child Ethnicity**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>18 (50)</td>
</tr>
<tr>
<td>African American</td>
<td>1 (2.7)</td>
</tr>
<tr>
<td>Asian</td>
<td>6 (16.7)</td>
</tr>
<tr>
<td>Latino</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>Other/Mixed</td>
<td>6 (16.7)</td>
</tr>
</tbody>
</table>

**Maternal Education**

<table>
<thead>
<tr>
<th>Education</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Diploma</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>Technical/Trade School</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>Some College</td>
<td>8 (22.2)</td>
</tr>
<tr>
<td>College Graduate</td>
<td>14 (38.9)</td>
</tr>
<tr>
<td>Post-Baccalaureate Courses</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>6 (16.6)</td>
</tr>
<tr>
<td>Professional Degree</td>
<td>1 (2.8)</td>
</tr>
</tbody>
</table>

**Gross Family Income**

<table>
<thead>
<tr>
<th>Income Level</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $30,000</td>
<td>4 (11.1)</td>
</tr>
<tr>
<td>$30,000-50,000</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>$50,001-70,000</td>
<td>4 (11.1)</td>
</tr>
<tr>
<td>$70,001-90,000</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>&gt;$90,001</td>
<td>18 (50)</td>
</tr>
</tbody>
</table>

**Child Autism Diagnosis**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Autism</td>
<td>25 (69.4)</td>
</tr>
<tr>
<td>Asperger’s</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>PDD-NOS</td>
<td>10 (27.8)</td>
</tr>
</tbody>
</table>
Table 2

Summary of Correlations, Means, and Standard Deviations for Independent Evaluator (IE) Rating of Separation Anxiety and Parent- and Child-Reported Parental Intrusiveness (PI) at Intake, Post-Treatment, and Change Scores

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sep. Anx.(^a) – IE Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.24</td>
<td>1.43</td>
</tr>
<tr>
<td>2. Sep. Anx.(^a) – IE Post-Treatment</td>
<td>.386**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.00</td>
<td>1.92</td>
</tr>
<tr>
<td>3. PI – Child Intake</td>
<td>.205</td>
<td>.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.17</td>
<td>3.46</td>
</tr>
<tr>
<td>4. PI – Child Post-Treatment</td>
<td>.244</td>
<td>.142</td>
<td>.637**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.55</td>
<td>2.50</td>
</tr>
<tr>
<td>5. PI – Child Change</td>
<td>.058</td>
<td>-.110</td>
<td>.719**</td>
<td>-.078</td>
<td></td>
<td></td>
<td></td>
<td>1.19</td>
<td>1.86</td>
</tr>
<tr>
<td>6. PI – Parent Intake</td>
<td>.309*</td>
<td>-.031</td>
<td>.631**</td>
<td>.581**</td>
<td>.257</td>
<td></td>
<td></td>
<td>14.27</td>
<td>3.56</td>
</tr>
<tr>
<td>7. PI – Parent Post-Treatment</td>
<td>.224</td>
<td>.204</td>
<td>.374*</td>
<td>.633**</td>
<td>-.088</td>
<td>.734**</td>
<td></td>
<td>12.14</td>
<td>3.65</td>
</tr>
<tr>
<td>8. PI – Parent Change</td>
<td>.092</td>
<td>-.328*</td>
<td>.287</td>
<td>-.089</td>
<td>.443**</td>
<td>.360*</td>
<td>-.369*</td>
<td>1.80</td>
<td>2.73</td>
</tr>
</tbody>
</table>

Note. Change scores calculated by subtracting post-treatment score from intake score. Positive change scores indicate lower levels of SAD and PI at post-treatment compared to intake (i.e. a decrease in severity). Negative change scores indicate higher levels of SAD and PI at post-treatment compared to intake.

\(^a\) Separation Anxiety

\(*p < .05; **p < .01\)
Table 3

*Hierarchical Multiple Regression Analysis Predicting IE-Rated Separation Anxiety Severity at Post-Treatment From Change in Parental Intrusiveness*

<table>
<thead>
<tr>
<th>Step</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.397</td>
<td>.158*</td>
<td>.397</td>
<td>2.488*</td>
<td>2.488*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep. Anx. – IE Intake</td>
<td>.604</td>
<td>.243</td>
<td>.397</td>
<td>2.488*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.513</td>
<td>.263*</td>
<td>.105*</td>
<td>.418</td>
<td>2.750*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep. Anx. – IE Intake</td>
<td>.636</td>
<td>.231</td>
<td>.418</td>
<td>2.750*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI – Parent Change</td>
<td>-.246</td>
<td>.115</td>
<td>-.325</td>
<td>-2.136*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* PI change scores calculated by subtracting post-treatment score from intake score.

* $p < .05$
CHAPTER 6: REFERENCES


MMWR; 63 (No.SS02), 1-21.


Sung, M., Ooi, Y. P., Goh, T. J., Pathy, P., Fung, D. S. S., Ang, R. P., Chua, A., & Lam, C. M.


