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The Family Environment and Children With an Autism Spectrum Disorder: A Longitudinal Examination of the Relation Between Parental Expressed Emotion and Child Externalizing Behaviors

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The University of Southern Mississippi

THE FAMILY ENVIRONMENT AND CHILDREN WITH AN AUTISM SPECTRUM
DISORDER: A LONGITUDINAL EXAMINATION OF THE
RELATION BETWEEN PARENTAL EXPRESSED EMOTION AND
CHILD EXTERNALIZING BEHAVIORS

by

Stephanie Bader

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2011

ABSTRACT

THE FAMILY ENVIRONMENT AND CHILDREN WITH AN AUTISM SPECTRUM DISORDER: A LONGITUDINAL EXAMINATION OF THE RELATION BETWEEN PARENTAL EXPRESSED EMOTION AND CHILD EXTERNALIZING BEHAVIORS

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August 2011

The current study, a longitudinal study using Bader (2009) as Time 1 data, used questionnaire data to explore the longitudinal relation between parental expressed emotion, a well-established predictor of symptom relapse in various other disorders (e.g., schizophrenia, bipolar, and behavior disorders), with change in externalizing behaviors in 84 children, ages 8 to 18, with an autism spectrum disorder (ASD). Both components of expressed emotion, criticism/hostility and overinvolvement, were explored, though hypotheses were only made in regard to criticism/hostility. It was found that high levels of parental criticism/hostility, not parental overinvolvement, at Time 2 uniquely related to higher levels of externalizing behaviors in children with an ASD at Time 2, even after controlling for severity of ASD symptoms, parental distress, and parenting practices. It was also found that parental expressed emotion, specifically criticism/hostility at Time 1, significantly related to a change in externalizing behaviors from Time 1 to Time 2, even after controlling for Time 1 total family income, severity of ASD symptoms, parental distress, and parenting practices. That is, higher levels of parental criticism/hostility at Time 1 predicted higher levels of child externalizing behaviors at Time 2. However, the

reverse was not found. Time 1 child externalizing behaviors did not predict a change in parental expressed emotion from Time 1 to Time 2. In looking at possible interactions with control variables, as exploratory analyses, very few findings were significant. This finding of a unidirectional relation between parental expressed emotion, specifically criticism/hostility, and child externalizing behaviors has important treatment implications as it indicates that a component addressing this high parental criticism/hostility would benefit the overall treatment aimed at reducing externalizing behaviors in children with an ASD.

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ACKNOWLEDGMENTS

The writer would like to thank the dissertation director, Dr. Tammy Barry, and the other committee members, Dr. Bonnie Nicholson, Dr. Sara Jordan, Dr. Bradley Green, and Dr. Christopher Barry, for their advice and support throughout the duration of this project. I would especially like to thank Dr. Tammy Barry for her invaluable advice and encouragement.

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CHAPTER I

INTRODUCTION

The current study examined the relation between parental expressed emotion and child externalizing behaviors within a sample of children and adolescents with a pervasive developmental disorder (also referred to as an autism spectrum disorder, ASD). In the DSM-IV-TR, there are five Pervasive Developmental Disorders: Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder, and Pervasive Developmental Disorder Not Otherwise Specified (APA, 2000). Because the base rates of Rett's Disorder and Childhood Disintegrative Disorder are low, children diagnosed with these disorders were not included in the current study.

The DSM-IV-TR criteria for diagnosing an ASD include three categories, impairments in social interaction, impairments in communication, and stereotyped behavior or restricted interests. The diagnosis of Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder – Not Otherwise Specified all involve varying combinations of these symptoms. The DSM-IV-TR criteria for Autistic Disorder are six or more symptoms with at least two impairments in social interaction, at least one impairment in communication, and at least one impairment in stereotyped behavior or restricted interests (APA, 2000). The DSM-IV-TR criteria for diagnosing Asperger's Disorder are two or more impairments in social interaction and at least one impairment in stereotyped behavior or restricted interests. In order to be diagnosed with Asperger's Disorder, the individual cannot have experienced any clinically significant delay in language development, cognitive development, or in the development of age-appropriate self-help skills (APA, 2000). The DSM-IV-TR criteria for diagnosing Pervasive

Developmental Disorder - Not Otherwise Specified (PDD-NOS) are severe impairment in reciprocal social interaction and also an impairment in either communication skills (verbal or nonverbal) or the presence of stereotyped behaviors or restricted interests, whereas the criteria for any of the other PDDs have not been met (APA, 2000).

In addition to the core symptoms of an ASD (deficits in communication and social interaction, as well as stereotypical and restrictive interests and behaviors), children with an ASD often exhibit other deficits and symptoms. Some of these other common symptoms include not responding to one's own name, maybe even appearing deaf, engaging in self-stimulating behaviors or idiosyncratic movements (like spinning in circles), perhaps to fulfill some sensory need and being hypersensitive to sensory inputs, such as sounds, touches, colors, smells, and tastes (Dominick, Davis, Lainhart, Tager-Flusberg, & Folstein, 2007). The child may not know how to play with toys correctly, may be disinterested in others, and may be overly resistant, uncooperative, and noncompliant (Matson & LoVullo, 2008). Often, a child with an ASD will throw violent and severe tantrums that may last hours and involve hitting, kicking, biting, and scratching both themselves and others, as well as throwing objects and breaking things (Dominick et al., 2007). These externalizing behaviors, although not a symptom of an ASD, are typically emitted out of frustration due to the inability to communicate or through operant conditioning where the tantrum behavior is maintained through its consequences (i.e., attention or escape from demand; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). Evidence to support this comes from treatment outcome research in which tantrum behaviors are decreased using differential reinforcement, contingent

reinforcement withdrawal, time-out, and communication training, to name a few (Margolies, 1977; Matson & LoVullo, 2008).

All of these behaviors—those that are symptoms of an ASD and those that are associated features of the disorder— make this a very taxing disorder on the family (Matson & LoVullo, 2008) and one that warrants extensive research to better understand its etiology, assessment, diagnosis, and effective treatments. The focus of the current study was on externalizing behaviors among children with an ASD. Although such behaviors are not inherent to the diagnosis of an ASD, they are a common associated feature and such behaviors often further complicate the clinical picture. The current study examined parenting variables, specifically parental expressed emotion, as possible precursors to child externalizing behaviors in a longitudinal design.

CHAPTER II

REVIEW OF RELATED LITERATURE

Autism Spectrum Disorder and the Family

Having a child with an ASD can add a great deal of stress to the family environment. Herring and colleagues (2006) found that the emotional and behavioral problems of a child with an ASD contributed significantly more to maternal stress, parent mental health problems, and perceived family dysfunction than child diagnosis (ASD or non-ASD), cognitive delay, or gender. Also, delays in the ability to socially relate to others exhibited by the child with an ASD were associated with overall parenting stress, parent-child relationship problems, and distress for mothers and fathers (Davis & Carter, 2008). However, cognitive functioning, communication deficits, and atypical behaviors were not uniquely associated with parenting stress (Davis & Carter, 2008).

As it has been well established that parents of a child with an ASD experience heightened levels of parental stress (e.g., Bishop, Richler, Cain, & Lord, 2007; Davis & Carter, 2008; Epstein, Saltzman-Benaiah, O'Hare, Goll, & Tuck, 2008; Tomanik, Harris, & Hawkins, 2004), it has become more salient to look at how this affects the child and his or her development. One study, conducted by Osborne, McHugh, Saunders, and Reed (2008), looked at the effectiveness of an early intervention program for children with an ASD after 9 to 10 months of treatment. They found that there was a relation between how many hours of intervention were received and gains in intellectual, educational, adaptive, behavioral, and social skills. However, the effectiveness (in terms of gains in such skills) of the early intervention program was moderated by parental stress levels, showing a significant decrease in effectiveness for the more time-intensive early intervention

(Osborne et al., 2008). Children of parents with high stress levels made significantly less gains than children of parents with low levels of stress. These findings show that, when setting up an early intervention program, parent training focusing on parental stress and/or counseling should be considered to ensure the effectiveness of the intervention. Osborne and colleagues (2008) theorized that higher levels of parenting stress may affect the parents' behaviors and parenting styles, which may affect the child outcomes. These findings show that in planning to implement a treatment, it is important to evaluate the treatment components and the family environment and parental factors, as they all have a significant effect on the treatment outcomes. This also illustrates the need to control for parental factors in evaluating relations between other variables and child outcomes.

One current area of research that focuses on ways to reduce the negative effects of parental stress both on the parent and the child is mindfulness training. This method provides parents with the education on more appropriate and effective parenting practices than they may be currently utilizing. Singh and colleagues (2007) have found that mindfulness training has provided transformational changes in parents, thus allowing them to produce positive differences in the behavior, learning, and well-being of their children with an ASD, without directly addressing those targets in the children. In the study, Singh and colleagues (2007) looked at occurrence of aggressive behavior in children with an ASD in 4 mother/child dyads that participated in a 12-week parent mindfulness training. Whereas it was found that a small reduction from baseline was evident during mindfulness training phase, more substantial reductions occurred during the mindfulness practice phase and, by the end of the phase, aggressive behavior was occurring minimally. The mindfulness practice phase consisted of the 52 weeks

immediately following the mindfulness training in which the mothers were instructed to continue using the mindfulness exercises and skills they learned in interacting with their children. The mothers did not receive any further training in this practice phase, which is analogous to a weekly follow-up. Again, it is important to note that the children's aggressive behaviors were not directly targeted in the mindfulness training that the mothers were receiving (Singh et al., 2007). Nevertheless, the measure of the child's aggressive behavior (i.e., frequency recordings of aggressive behavior occurrences) was used to assess how the mothers were able to implement, in their daily lives, the overall mindfulness principles and skills they were taught in the training. Thus, whereas the outcome measure was the child's aggressive behaviors, the focus of the mindfulness trainings was on overall mindfulness principles and skills. The findings illustrate that mindfulness training altered the mothers' overall parenting practices which, in turn, improved not only the mothers' stress, but also the behaviors of the children with an ASD. These examples of mindfulness training, and other treatments targeting parental factors serve to illustrate that children's behaviors, specifically externalizing behaviors, can be improved by a treatment package focusing on changing parenting factors such as parental stress or mindfulness.

Such research further underscores the importance of considering how parental factors, most notably parental stress and parenting practices, affect the behaviors of the child with an ASD. Well-established parenting variables need to be assessed and controlled for in order to determine if other variables, such as expressed emotion, accounts for unique variance above and beyond these more established predictors.

Expressed Emotion

The construct of expressed emotion was initially established by Brown and Rutter (1966) to quantify the level of criticism, hostility, and emotional overinvolvement exhibited by one family member regarding another. It was one of the first instances that utilized the approach of rating emotions expressed during an interview by both verbal and vocal aspects of speech; that is, both what was said, as well as the loudness, pitch, and rhythm with which it was said, were considered (Brown & Rutter, 1966). Since its establishment, the construct of expressed emotion has been studied as a psychosocial influence on mental illnesses, specifically schizophrenia (Barrowclough & Hooley, 2003). According to Hooley and Gotlib (2000), expressed emotion is a measure of the extent that a family member talks about that patient in a critical or hostile way or in a way illustrating emotional overconcern or overinvolvement. To further clarify, it is not a characteristic of the patient, but rather a characteristic of the patient's family members.

A semi-structured interview of the family member is typically used to assess the levels of expressed emotion (Barrowclough & Hooley, 2003). High expressed emotion is rated if the family member makes a number of critical comments that are above the established threshold, indicating signs of marked hostility, or indicating marked evidence of emotional overinvolvement (Hooley & Gotlib, 2000). Cut-off scores have been established in order to accurately categorize these levels as low, medium, or high expressed emotion, criticism/hostility, or overinvolvement. (It is important to note that these cut-off scores have been developed based on patients with schizophrenia and, as will be seen further in this literature review, do not necessarily apply to other populations, especially child populations. Examining samples of those other populations, previous

studies have created adjusted cut-off scores or examined the expressed emotion scores as a continuous variable.)

In the semi-structured interview, criticism is assessed by comments about the individual or his behavior that the interviewee finds annoying or resents (i.e., “I get so mad when he makes a mess”). Hostility is rated by whether or not the interviewee makes generalized critical comments or expresses emotions such as rejection of the individual during the interview (i.e., “My son is the worst”). Criticism and hostility are also assessed by the tone and changes in the family member’s voice during the semi-structured interview. An example, provided by Greenberg, Seltzer, Hong, and Orsmond, (2006), of a parent demonstrating high criticism/hostility in talking about her son with an ASD is:

What kind of a person he is? Well he’s a very unique individual. How can I put this? One of the things about Jonnie is that I really like him when he’s in a good mood but when he’s in a bad mood, it’s impossible for us. I still cannot trust him being alone in the house without destroying something. He’s compulsive, and he’s so controlling, especially with me. The tension in the household gets absolutely incredible. He is very, very stubborn. He’ll tend to scream to the point where my eardrums vibrate at that point. I suppose that’s his only way to fight something he’s scared of. He doesn’t have any social skills. One of the biggest problems is what to do to fill his time; he gets bored real easily and has a lot of compulsive behaviors that are difficult to deal with. He hates change and doesn’t want to move but he’s becoming impossible to live with. (p. 234)

Whereas this parent may actually be experiencing this child as a difficult child, a parent with low criticism/hostility would also include more positive descriptions of the child and

make less intense generalized negative statements of the child's overall character and personality.

Emotional overinvolvement is measured by the interviewee's excessive emotional response (i.e., "I can't go shopping; what if he needs me?"). These are behaviors that can be seen as over-intrusive, self-sacrificing, and over-identifying with the individual (Barrowclough & Hooley, 2003). Emotional overinvolvement is also measured by the tone and changes in the family member's voice as well as emotional expressions, such as crying. It is easy to misinterpret the construct of emotional overinvolvement as a positive or healthy construct. It is important to note that it is not indicated by advocacy or protective behaviors exhibited by the family member that are necessary to ensure the safety and overall wellbeing of an individual with a disability (Greenberg et al., 2006). For example, a mother who is very active in advocating for her child, making sure he receives all of the appropriate services, both in and out of school, is not demonstrating emotional overinvolvement. Emotional overinvolvement is a family member's extreme, stifling, over-identification with the child that does not allow the child to function as an independent individual. It is also characterized by an over-protectiveness of the individual that is disproportionate (as per the established cut-off scores) for that individual's developmental, functional, and cognitive capabilities. One final aspect of emotional overinvolvement is that of excessive praise of the individual, beyond what would be expected given that individual's level of functioning (Greenberg et al., 2006). An example provided by Greenberg and colleagues (2006) of a parent demonstrating high emotional overinvolvement in talking about her daughter with an ASD is:

Susie is almost 17 years old. She is very intelligent, creative, and brave. She is a very moral person. At times because of her needs, she is the focus, the central focus, of our family. Our communication is, a lot of times, not verbal. Throughout her life, I have been her interpreter, interpreting her to the world and then interpreting the world to her. I've always been the one who could understand that what she was saying was not meaningless. I oftentimes wonder how much of my identity is wrapped up in her. Where is the line? Where does Susie end and I begin? (p. 235)

The Camberwell Family Interview (CFI), developed by Vaughn and Leff (1976), was the initial measurement of expressed emotion. It is a standardized interview which takes between one to two hours to complete. The interview is recorded and then later coded for the number of critical comments and the degree of emotional overinvolvement. These two components of expressed emotion are rated on a 6-point scale. Since the development of the Camberwell interview, various other measures have been established. These measures are shorter in length such as the Five Minute Speech Sample (FMSS; Magaña et al., 1986), where parents are asked to speak about their child freely for five minutes. Others are written in questionnaire format such as the Family Questionnaire, (FQ; Wiedemann, Rayki, Feinstein, & Hahlweg, 2002), which consists of 20 questions for which the family member rate their own feelings regarding their child. Validity and reliability data have been collected on these other measures, establishing them as suitable alternative measures of expressed emotion to the standard Camberwell Family Interview.

Nature and Development of Expressed Emotion

The development of expressed emotion has been widely studied in family members of individuals with schizophrenia as well as some other disorders (Barrowclough & Hooley, 2003; Barrowclough, Johnston, & Tarrier, 1994; Hooley & Gotlib, 2000). Initially, expressed emotion was described as, and referred to, as a trait. Those individuals characterized with low expressed emotion were seen as tolerant, supportive, and sensitive to the patient's needs, whereas those individuals with high expressed emotion were seen as intolerant, unsupportive, and likely to use inappropriate methods of dealing with the difficulties presented to them (Barrowclough & Hooley, 2003). These descriptions were used to depict how the family member was overall. Whereas this was useful for describing the home environment, it was necessary to establish more explanatory models of how high expressed emotion is developed and maintained in order to improve the treatment outcomes of schizophrenia and other behavioral and medical disorders associated with expressed emotion (Wearden, Tarrier, Barrowclough, Zastowny, & Rahill, 2000).

A more explanatory model considers the family member's attribution style in reference to the individual with the disorder. Attributional style refers not only to how the family member sees the individual with the disorder, but also whether he or she believes the individual is or is not in control of his or her behaviors (Barrowclough & Hooley, 2003). Those family members with high expressed emotion, specifically criticism, tended to explain the behaviors of the individual with the disorder as being internal to that individual. Those family members with high hostility described the individual's behaviors as not only being internal but also controllable by the individual

(Barrowclough, Johnston, & Tarrier, 1994). Throughout the research, including outcome studies, these have become the staple characteristics of high criticism/hostility and have thus become the focus of treatments aimed to lower expressed emotion in the family member (e.g., Butzlaff & Hooley, 1998).

Another way of conceptualizing the development of expressed emotion within the family member is utilizing a diathesis-stress model (Hooley & Gotlib, 2000). In this more relational theory, it is theorized that the development of expressed emotion in the family member is the product of the interaction of both the patient's and the family member's unique characteristics as well as the everyday stressors that are encountered (Hooley & Gotlib, 2000). In this way of conceptualizing the development of high expressed emotion, the focus is on the interaction between the family member's and the patient's characteristics, instead of being solely on the patient. Thus, for example, due to their child's behaviors and symptoms as well as the family members' response style of being easily stressed, these family members develop high expressed emotion. Family members with high expressed emotion do not necessarily blame the patient for developing the disorder, but rather they view the patient's behaviors as still under the patient's control and believe that volitional factors play a significant role in the patient's ability to get better (Hooley & Gotlib, 2000). Family members with low expressed emotion, on the other hand, are more tolerant of the patient's behaviors and personality characteristics as they see these as being beyond the patient's control. Family members with low expressed emotion do not blame the patient for his or her symptoms like is done by those family members with high expressed emotion. This personal characteristic of being more tolerant and this knowledge that the patient's behaviors are beyond his or her control

provide a buffer from the stress of living with that patient, as the family member demonstrates greater levels of acceptance and a lower need for control over the patient and his or her behaviors. Consequently, this allows the family member to continue experiencing lower levels of distress. Thus, such tolerance and knowledge are protective factors against the development of high expressed emotion within the family member, regardless of the patient's initial levels of symptom severity (Hooley & Gotlib).

The diathesis-stress model also applies to the patient (Hooley & Gotlib, 2000). The patient's exposure to stressful environments, caused by high expressed emotion from a family member, decreases the patient's ability to utilize the coping mechanisms learned in treatment, thus decreasing the ability to control symptoms. This theoretical model—that high expressed emotion adds extra stress in the household and the patient cannot adequately cope with this extra stress—allows researchers and clinicians to focus on the interaction between the family member and the patient in order to develop the most effective interventions for that particular situation (Hooley & Gotlib, 2000).

Further support of these theories could be found in the effectiveness of treatments targeting expressed emotion. In exploring the treatments used to address high expressed emotion, one interesting finding is that mindfulness training (Christensen & Jacobson, 2000) actually accomplishes similar goals as treatments targeting expressed emotion. It addresses the parent's view of the situation, child, and world as a whole and helps to train the parent how to react to a behavior in a less emotional and more problem-solving focused manner.

Expressed Emotion and Schizophrenia

Given the plethora of studies examining expressed emotion in families of patients with schizophrenia and the dearth of studies on expressed emotion in families with a child with an ASD, it is important to look at the relation between expressed emotion and symptoms within the well-studied schizophrenia patient population in order to establish a model for the relation between expressed emotion and externalizing behaviors in children with an ASD. When patients with schizophrenia have family members with high levels of expressed emotion, they are at a heightened risk for symptom relapse upon being released from an inpatient facility (Hooley & Gotlib, 2000; Leff & Vaughn, 1985). For example, a meta-analysis of 27 studies conducted by Butzlaff and Hooley (1998) found that, with a mean effect size of $z_r = .31$, 65% of those patients exposed to high parental expressed emotion, but only 35% of those patients exposed to low parental expressed emotion, experienced symptom relapse. Only three of the 27 studies found a negative relation between expressed emotion and patient relapse in patients with schizophrenia, with effect sizes ranging from $z_r = -.05$ to $z_r = -.16$ (Butzlaff & Hooley). Each of the other 24 studies found a positive relation between expressed emotion and patient relapse in patients with schizophrenia, with effect sizes ranging from $z_r = .06$ to $z_r = .72$. Butzlaff and Hooley (1998) then explored the effect size for the relation between expressed emotion and relapse rate with the chronicity category: recent onset, mixed, and chronic. It is important to note that the symptom severity levels of the patients did not differ between the family members that had high or low expressed emotion. It was found that expressed emotion was the strongest predictor of relapse in patients categorized as having chronic symptomology. However, as is apparent from the range of effect sizes, the findings are

mixed. This could be due to the fact that these studies have been conducted in various geographic locations throughout the world with heterogeneous samples. For example, the effect sizes found in Eastern Europe were unusually high, whereas the effect sizes found in Australia were unusually low, in comparison with the other parts of the world (Butzlaff & Hooley). Thus, the mixed findings could be due to the individual diagnostic and treatment practices of each country. For example, due to varying definitions of what is considered normal between countries, the populations diagnosed with schizophrenia could differ greatly based on the symptoms exhibited and the severity of these symptoms.

In trying to understand the relation between a family member's expressed emotion and schizophrenic symptom relapse in the patient, Brown, Birley, and Wing (1972) theorized that those with genetic vulnerabilities for developing schizophrenia become over-stimulated by high levels of expressed emotion, which in turn elevates their bodies' arousal levels and decreases their ability to effectively cope with the stress. This hypothesis, that high levels of expressed emotion raises the individual's physiological arousal thus decreasing his or her ability to cope, has been supported by various studies. For example, Tarrrier and Turpin (1992) found that an individual with schizophrenia's skin conductance, an indication of stress, increased when interacting with family members who demonstrated high expressed emotion. At the time of the experiment, the family members were not demonstrating any form of high expressed emotion, indicating that the reaction was simply due to the exposure to that family member not to a stressful situation, indicating that any interaction, even positive or neutral, with this family member elicited a conditioned stress response. This finding highlights that the measure of

parental expressed emotion might be a proxy for a history of actual negative interactions that occur between the family member and the patient over time.

It has been theorized that mediating and/or moderating variables such as the severity of the symptoms, or simply the stress of living with a disordered family member, could account for the relation between expressed emotion and schizophrenic symptom relapse. However, Nuechterlein, Snyder, and Minz (1992) as well as Hooley, Rosen, and Richters (1995) found that, after controlling for other potential third variables, expressed emotion still independently related to relapse. Thus, whereas there may be a direct link between these mediating variables and schizophrenic symptom relapse, family member expressed emotion appears to have its own unique relation to schizophrenic symptom relapse. Nuechterlein et al. (1992) explored other variables using a path analysis of chain of effect, detailed by Loehlin (1987), which allows possible relations between variables to be explored, while statistically controlling for the effects of the other variables. Using this path analysis, neither age of illness onset, living with relatives before key hospital admission, nor patient illness severity significantly related to relapse one year after release from hospitalization. Expressed emotion level was the only variable examined that significantly related to relapse one year after release from hospitalization (Nuechterlein et al.).

The strongest support of the relation between expressed emotion and relapse rate of schizophrenic symptoms comes from outcome research on interventions designed for schizophrenia. These studies have shown that patient relapse rates were greatly reduced when a component of the overall intervention was added that was designed to educate the family members and help them cope better with the patient's illness (thus lowering the

family members' expressed emotion; Pharoah, Mari, & Streiner, 1999; Pitschel-Walz, Leucht, Bauml, Kissling, & Engel, 2001). Pitschel-Walz et al., in a meta-analysis of the effectiveness of family interventions on the relapse of symptoms in patients with schizophrenia, found that relapse rates following family interventions plus patient interventions were significantly less than the usual care, $r = .17$, after the first year and, $r = .23$, after the second year. One of the main findings of Pitschel-Walz et al. was that patient relapse rates can be reduced by 20% if the family member is included in the treatment package. The most common elements of family interventions that have been found to be effective involve psychosocial support for the family member, educating the family member about the illness, improving communication between the family members, and improving problem-solving skills (Hooley & Gotlib, 2000).

Expressed Emotion and Other Clinical and Community Populations

As previously described, expressed emotion is a well-validated predictor of relapse among patients with schizophrenia. In particular, a patient with schizophrenia is more likely to have a relapse of symptoms if he or she is living with high expressed emotion family members than is a patient living with low expressed emotion family members. This well-established relation between expressed emotion and schizophrenia has led to the further exploration of this construct in other populations, such as depression, mania, bipolar, anxiety disorders, posttraumatic stress disorder, eating disorders, health disorders, asthma, epileptic symptoms, behavior disorders, and alcohol and drug abuse in children, adolescents, and adults (Butzlaff & Hooley, 1998; Chambless & Steketee, 1999; Hooley & Gotlib, 2000; Stubbe, Zahner, Goldstein, & Leckman, 1993; Tarrier, Sommerfield, & Pilgrim, 1999; Wearden et al., 2000). The findings from these

studies have consistently shown that expressed emotion has been linked to poorer outcomes in treatment, increased problem behaviors, and relapse following release from an inpatient facility (Butzlaff & Hooley; Hooley & Gotlib). In examining the components of expressed emotion, high criticism and hostility have been found to be associated with disruptive behaviors, whereas overinvolvement has been found to be associated with anxiety disorders and depression (Stubbe et al.).

Other studies, such as those conducted by McCarty and Weisz (2002) and McCarty, Lau, Valeri, and Weisz (2004), have looked at the validity of broadening the use of expressed emotion measures, such as the five-minute speech sample, with children and adolescents. These studies have found that the criticism/hostility component, not the emotional overinvolvement component, relates to the behavior and psychopathology of children and adolescents. This may be due to the fact that the amount of parental involvement necessary varies greatly not only within children as they develop, but also between children due to their individual differences, whereas with the criticism/hostility component, the valence of parents' emotional responses may serve as a precursor for higher levels of externalizing behaviors regardless of the children's age.

Specifically, McCarty and Weisz (2002) looked at the relation between expressed emotion components measured by the Five-Minute Speech Sample and child externalizing behaviors and psychopathology. Since the criteria established for the Five-Minute Speech Sample were created using a sample of adults with schizophrenia, it is important to note that parental criticism/hostility and emotional overinvolvement should, developmentally, manifest differently in younger populations and should vary with the child's age. For instance, how involved parents are in their child's everyday activities

changes throughout the child's developmental progression, going from complete involvement in infancy to little to no involvement in late adolescence and adulthood. This makes the validity of using the criteria established on an adult population questionable for use on a child population. Indeed, a difference between adult and child samples was found by McCarty and Weisz. The criticism/hostility component of expressed emotion appeared to remain a negative indicator of the parent-child relationship and the child's externalizing behaviors. Based on the inconsistent and non-significant findings for the emotional overinvolvement component, on the other hand, it may need to be revised or reconstructed for use with children and adolescents due to the developmental differences between children/adolescents and adults (McCarty & Weisz). These findings have been consistently supported in that, within various child populations, the main predictor of behavior problems or symptom relapse is parental criticism/hostility, not parental overinvolvement (e.g., Peris & Baker, 2000; Peris & Hinshaw, 2003).

McCarty and colleagues (2004) also provided evidence for the theory that the level of parental expressed emotion affects how a parent interacts with his or her child. In their study, they observed and coded parent-child interactions in clinic-referred children and adolescents, ages 7 to 17 years, as well as measured the parents' expressed emotion. They found support for the validity of the criticism/hostility component, in that parents with high criticism/hostility showed more antagonism, negativity, harshness, and disgust; in other words, these parents showed more emotional valence in their responses to behavior. They also were less responsive to their children as compared to parents with borderline or low criticism/hostility. There were no observed behaviors in the parent-child interaction that correlated with parental emotional overinvolvement (McCarty et

al.). This again provides support for a strong relation between child behaviors and the criticism/hostility component, and not the emotional overinvolvement component, of parental expressed emotion.

Stubbe and colleagues (1993) found a significant relation between expressed emotion in mothers and clinical diagnoses in their children in a community sample. In their study, they found that 56.1% of those children with a mother with high expressed emotion were diagnosed with a disorder as compared to 18.9% of those children with a mother with low expressed emotion. In addition, 72.4% of children with a mother high on the critical comment subscale of expressed emotion were diagnosed with at least one disruptive behavior disorder [Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), or Conduct Disorder; Stubbe et al.], specifically underscoring the possible link between expressed emotion and externalizing behaviors. Due to the fact that this was a cross-sectional study, no temporal sequencing could be determined. However, this study highlighted a significant relation between parental expressed emotion and child externalizing behaviors that needs to be further studied to understand the directionality.

Peris and Hinshaw (2003) examined the relation between parental expressed emotion, ADHD symptoms, and disruptive behavior in preadolescent girls. The sample included 131 girls aged 6 to 12 years: 81 with an ADHD diagnosis and 50 without a diagnosis in the comparison group. It was found that high parental expressed emotion, specifically criticism/hostility but not emotional overinvolvement, significantly related to both ADHD and aggressive behaviors. These relations held even when controlling for parenting stress and maternal depression. Furthermore, the relation between parental

criticism and ADHD held even when controlling for aggression. However, the reverse was not found; the relation between parental criticism and aggression did not hold when controlling for ADHD (Peris & Hinshaw). These results imply that, in this sample, the relation between expressed emotion and both an ADHD diagnosis and aggressive behavior appears to be carried by the relation between expressed emotion and an ADHD diagnosis uniquely, potentially indicating that there is something specific to ADHD symptoms relative to aggressive behaviors (e.g., ADHD tends to be more neurological) that plays a role in the level of parental expressed emotion (Peris & Hinshaw). This relation could be due to the neurological component of ADHD, in that these children interpret and process their parents' expressed emotion differently than children without a neurologically-based disorder.

Peris and Baker (2000) conducted a two-year longitudinal study exploring the relation between maternal expressed emotion and child disruptive behaviors from preschool to first grade in a community sample ($N = 91$) and found a stable level of maternal expressed emotion scores, as well as a significant association between expressed emotion level and externalizing behaviors. Specifically, 72.7% of the children with high externalizing behaviors, 28.6% with borderline externalizing behaviors, and 18.5% with low externalizing behaviors had parents with high expressed emotion (Peris & Baker). Criticism uniquely related to externalizing behaviors. Specifically, of those mothers scoring high on the criticism scale, 64% had children with high externalizing behaviors, 19% had children with borderline externalizing behaviors, and 7% had children with low externalizing behaviors (Peris & Baker). In addition, maternal expressed emotion ratings at Time 1, when the children were in preschool, were significantly related to the severity

of the child's externalizing behavior at Time 2, when the children were in first grade. It was also found that high levels of maternal expressed emotion at Time 1, when the children were preschool age, predicted the children's classification of ADHD at Time 3, when the children were in 3rd grade, this effect being almost completely determined by the criticism dimension of expressed emotion. After controlling for both problem behaviors in preschool and maternal stress, expressed emotion accounted for 7.7% of the variance. When this hierarchical multiple regression was performed again assessing only the criticism component of expressed emotion, the percent of variance accounted for remained at 7.7% (Peris & Baker). When assessing only the emotional overinvolvement component of expressed emotion, it did not account for any of the unique variance in ADHD symptom scores (Peris & Baker). This underscores the importance of the criticism component of expressed emotion, specifically, when considering behavioral symptoms in children.

Baker, Heller, and Henker (2000) conducted a similar study looking at how parental expressed emotion related to 112 preschool-aged children's behaviors in a community sample. Their findings were similar to those of Peris and Baker (2000) in that they found that parents of children with high problem behaviors had the highest proportion of high expressed emotion, specifically high criticism/hostility, 41.2%. The proportion of high expressed emotion for children with borderline levels of behavior problems was 15.8%, whereas it was 8.1% for the comparison group. However, as opposed to previous findings, they did not find parental expressed emotion at preschool age to be predictive of behavior problems at first grade. Also, interestingly, none of the

parental expressed emotion components provided unique variance beyond maternal stress (Baker, Heller, & Henker).

These previous studies provide the basic support for the current study. This initial literature base has begun to broaden the use of the measure of parental expressed emotion to other clinical, nonclinical, and medical populations beyond schizophrenia, the population on which it was originally developed. Such previous work provided the support needed to explore the relation in other populations.

Expressed Emotion and Intellectual Disabilities

Hastings and Lloyd (2007) conducted a review of expressed emotion in families of children and adults with intellectual disabilities. In their review, they looked at any study that examined the levels of expressed emotion in these families. Thus, many of the studies were simply descriptive of the families' level of expressed emotion and did not necessarily examine the relation between parental expressed emotion and the child's behavior. Hastings and Lloyd (2007) found 11 published studies at the time looking at either the base rate of expressed emotion in families of children and adults with intellectual disabilities or the relation between expressed emotion and other variables in these families. These studies included Beck, Daley, Hastings, and Stevenson (2004); Clerici and colleagues (1998); Datta, Russell, and Gopalakrishna (2002); Dossetor, Nicol, Stretch, and Rajkhowa (1994); Greedharry (1987); Greenberg and colleagues (2006); Hastings, Daley, Burns, and Beck (2006); Kumar, Singh, and Sahu (2004); Lam, Giles, and Lavander (2003); Orsmond, Seltzer, Greenberg, and Krauss (2006); and Sabarese and Todman (2004). All of these studies, with the exception of Greenberg and colleagues, are cross-sectional; they only examine a relation between the variables and do not permit any

temporal sequencing inferences. It is important to note that these studies look at individuals with intellectual disabilities, which include—but are not limited to—individuals with an ASD. Those studies that specifically included individuals with an ASD will be reviewed in the next section.

Out of the 11 studies reviewed by Hastings and Lloyd (2007), two studies, Datta and colleagues (2002) and Kumar and colleagues (2004), both conducted in India, did not adequately describe the methods or analyses used; thus, their findings should be interpreted with caution.

According to Hastings and Lloyd, the study conducted by Datta and colleagues was the first published study using the Five-Minute Speech Sample on parents of children with intellectual disabilities. This study looked at 31 parents of children ages 3 to 16 with an intellectual disability. Whereas it is unclear how they coded this speech sample, if, according to Hastings and Lloyd, one interprets the label “negative emotions” as criticism/hostility and “positive emotions” as emotional overinvolvement, then 12 parents (39%) were coded high on criticism and 19 parents (61%) were coded high on emotional overinvolvement (Datta et al.).

Kumar and colleagues (2004) used an attitudes questionnaire that they developed in India. They, however, did not describe or report any psychometric properties of this questionnaire. Keeping that in mind, the study looked at expressed emotion in 23 mothers of children with an intellectual disability and 26 mothers of children without an intellectual disability. The group comparisons did show that mothers of children with an intellectual disability had higher overall expressed emotion, including both components (i.e., criticism/hostility and emotional overinvolvement).

Greedharry (1987) and Dossetor and colleagues (1994) both looked at expressed emotion using the CFI with a sample of individuals with an intellectual disability. Greedharry was the first to explore this relation. After modifying the criteria for this population, it was found that 20-30% of caregivers (i.e., mothers and sisters) of individuals ages 16 to 50 with an intellectual disability were classified as having high expressed emotion, specifically emotional overinvolvement. None were classified as having high criticism/hostility. However, the results varied based on the cut-off score that was used. Furthermore, the conclusions were based on a very low sample size ($N = 10$) and may not be representative of most family members of individuals with an intellectual disability.

Dossetor and colleagues (1994) then modified the cut-off criteria from five or more to three or more critical comments in their sample of 92 adolescents with severe intellectual disabilities. They found that 25 parents (27%) were high on emotional overinvolvement and 30 (33%) were high on criticism/hostility. Those who were high on expressed emotion also reported more psychological distress, less social support, and had adolescents with more behavior problems and more mild disabilities (Dossetor et al.). Orsmond and colleagues (2006) found similar rates when looking specifically at rates of expressed emotion among mothers of an individual with an ASD; that is, just less than 30% of mothers exhibited high expressed emotion in a sample of 202 adolescents and adults with an ASD living at home.

Clerici and colleagues (1998) looked at expressed emotion in 16 mothers, eight fathers, and six other relatives of 14 adult women and six men with severe intellectual disabilities. Using the CFI, twelve of the 30 relatives (40%) were coded as having high

expressed emotion. Of these, 10 (33%) were coded as having high emotional overinvolvement, and nine (30%) were coded as having high criticism/hostility. In comparing expressed emotion in relatives of individuals with an intellectual disability with relatives of individuals with schizophrenia who were matched on demographic variables, there was not a statistically significant difference between the rates of high expressed emotion in the family members (Clerici et al.). Lastly, Clerici and colleagues reported that relatives with high expressed emotion were more likely to be related to an individual who not only had intellectual disabilities, but also significant behavior problems or epilepsy. These previous studies all highlight that parents of children with an intellectual disability experience higher rates of expressed emotion than found in the general population. Together with the knowledge that high expressed emotion is associated with negative outcomes in other populations, these studies provide support for the need to examine these relations in the ASD population.

One final CFI study, conducted by Lam and colleagues (2003) and that was part of the Hastings and Lloyd (2007) review, is particularly pertinent to the current study in that it examined children with intellectual disabilities who had significant behavior problems. Out of the 47 parents of 27 children (both mothers and fathers in most cases) who were interviewed and who completed numerous questionnaires, 14 parents (30%) were coded as having high criticism, with nine of these parents (19%) also being coded with some hostility. Also, 10 parents (21%) were coded as having high emotional overinvolvement. Lam and colleagues also found that mothers were more likely to be coded as having high expressed emotion, with higher scores for the criticism component. Other factors relating to high parental expressed emotion included less social support,

more parental stress, and the child having more severe behavior problems. These factors all contributed to a more stressful environment, providing a possibly beneficial point of intervention.

Other studies reviewed by Hastings and Lloyd (2007) examining expressed emotion with other measures are also relevant for consideration for the current study. For example, Beck and colleagues (2004) examined the reliability of the Five-Minute Speech Sample, administered over the phone; with 33 mothers of children with an intellectual disability (18 of the children had Down's syndrome). They found good inter-rater reliability and test-retest reliability. Also, in assessing whether conducting the Five-Minute Speech Sample over the phone would afford different results than is typically conducted face-to-face, they conducted the assessment instrument using both methods with six pilot participants. In this pilot study, they found 100% correspondence between the results of the two methods, supporting that over the phone was a valid means of conducting the speech sample. In the larger study, Beck and colleagues found that 20 of the mothers (60%) were coded as having high expressed emotion. Beck and colleagues also compared the mother's expressed emotion toward the child with the intellectual disability to a sibling without a disability. They found that the mothers had higher overall expressed emotion, as well as both higher criticism/hostility and emotional overinvolvement, toward the child with the disabilities when compared to their expressed emotion toward a non-disabled sibling.

In another study, Sabarese and Todman (2004) used the patient version of the Level of Expressed Emotion (LEE; Cole & Kazarin, 1988) scale to assess expressed emotion in both family members and the support staff of 28 adults who were living in a

residential setting but who also had home visits. This scale has been validated against the CFI, and whereas its association with the CFI is not exceptionally strong, there has been extensive evidence supporting its predictive validity in increased symptom severity in various psychological disorders (Hooley & Parker, 2006). Sabarese and Todman found that post-home visit psychological well being, depression, adaptive behaviors, and behavior problems were significantly correlated with the total expressed emotion exhibited in the interview by both the residential facilities staff and the individual's family members. This correlation existed even controlling for the individual's pre-home visit scores on those variables, indicating the robustness of the finding.

These set of studies, examining expressed emotion among the families of children with intellectual disabilities, provide even further support for exploring the relation in children with an ASD. Since the relation between parental expressed emotion and child externalizing behaviors was found in more heterogeneous populations, it only follows to explore more homogenous subpopulations—such as children with an ASD—to determine the nature of the relation between parental expressed emotion and child behaviors.

Expressed Emotion and Externalizing Behaviors in Children with an ASD

To date, three known studies have been conducted studying expressed emotion and externalizing behaviors among children with an ASD (Bader, 2009; Greenberg et al., 2006; Hastings et al., 2006). Each of these studies found a significant relation between expressed emotion, specifically criticism, and externalizing behaviors, such as tantrums, hitting, screaming, and breaking items, among children with an ASD.

Hastings and colleagues (2006) conducted a cross-sectional and longitudinal study on the relation between maternal expressed emotion and children ages 3 to 19 years

with intellectual disabilities. Of 76 participants, 24 had a diagnosis of autism and the others were diagnosed with Down Syndrome or mental retardation. It was found that, in the cross-sectional analysis, expressed emotion, specifically criticism, was related to externalizing behaviors. In the longitudinal analysis, levels of expressed emotion were found to be stable over the two-year study but were not related to externalizing behaviors (Hastings et al.). In summary, only the criticism component of expressed emotion, not the emotional overinvolvement component, was cross-sectionally related to externalizing behaviors, and neither component of expressed emotion was longitudinally related to externalizing behaviors (Hastings et al.). It is important to note that, although this study included children with autism, it was actually conducted on a heterogeneous sample of children with intellectual disabilities. It is possible that a directional relation was not found due to this heterogeneity.

Greenberg and colleagues (2006) conducted a longitudinal study on the effects of families' expressed emotion on their adolescent or adult children with autism. Using the Five-Minute Speech Sample (FMSS), mothers were asked to speak about their sons or daughters. This speech sample was then coded, using the manual developed by Magaña et al. (1986), and rated as high, borderline, or low for criticism and overinvolvement. The Problem Behavior subscales of the Scale of Independent Behavior-Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996) were used to measure eight problem behaviors which load onto three subscales: Internalized Maladaptive Behavior (hurtful to self, unusual or repetitive habits, and withdrawn or inattentive behavior), Asocial Maladaptive Behavior (socially offensive and uncooperative behavior), and Externalized Maladaptive Behavior (hurtful to others, destructive to property, and disruptive behavior). The Autism

Diagnostic Interview-Revised (Lord, Rutter, Le Couteur, 1994), the Wide Range Intelligence Test (Glutting, Adams, & Sheslow, 2000), and the Vineland Screener (Sparrow, Carter, & Cicchetti, 1993) were used to measure autism symptoms, intellectual ability, and adaptive behavior, respectively.

Parents were rated as high on expressed emotion if they were rated high on criticism and/or emotional overinvolvement. In operationally defining these variables, Greenberg and colleagues (2006) rated parents high on criticism if, during the FMSS, they either made a negative opening remark, described their relationship with their child in negative terms, or made at least one criticism about their child. Parents were rated as borderline if they did not meet the above requirements, but still made at least one statement of being dissatisfied with their relationship with their child, and a rating of low was given to parents who did not make any critical comments (Greenberg et al.).

Parents were rated as having high emotional overinvolvement if they either expressed excessive self-sacrificing or overprotective feelings toward their child or if they experienced an emotional reaction (e.g., crying) during the FMSS. Also, emotional overinvolvement was rated high if parents exhibited two or more of the following behaviors: described their child's past in excessive detail, made a personal statement about their attitude, excessively praised their child (indicated by at least five positive remarks). Parents were rated as borderline if there was evidence of emotional overinvolvement but they did not meet the above criteria, and a rating of low was given to parents who did not make any of the above indicators of emotional overinvolvement (Greenberg et al., 2006).

Greenberg and colleagues (2006) found that, controlling for initial levels of behavior problems, as measured by the Problem Behavior subscales of the Scale of Independent Behavior-Revised (Bruininks et al., 1996), high levels of maternal expressed emotion were related to an increase in severity and intensity of externalizing, internalizing, and socially maladaptive behaviors over time among the individuals with autism. When looking at the components of expressed emotion, levels of criticism had the strongest relation with these problem behaviors. It was also found that externalizing behaviors, $r = .71$, as well as expressed emotion, $r = .41$ and $r = .46$, for criticism and overinvolvement, respectively, were consistent over the 18-month study (Greenberg et al.).

Interestingly, Greenberg and colleagues (2006) did not find any cross-lagged effects between levels of expressed emotion and problem behaviors. Specifically, high maternal expressed emotion was related to, 18-months later, an increase in externalizing, $r = .28$, internalizing, $r = .27$, and socially maladaptive behaviors, $r = .33$, among the individuals with autism. However, high levels of problem behaviors were not related to an increase in maternal criticism 18-months later. It had previously been theorized that the high levels of externalizing behaviors could cause the parents to develop high levels of expressed emotion, which could then cause the behavior problems to increase (i.e., a bidirectional effect). The study by Greenberg and colleagues suggests that, rather than a bidirectional effect, there may actually be a unidirectional effect of expressed emotion on problem behaviors in adolescents and adult children with autism given that expressed emotion significantly predicted a later increase in externalizing behaviors, whereas high

levels of externalizing behaviors did not significantly predict increases in expressed emotion.

The Greenberg and colleagues (2006) study provided a strong starting point as the first study looking at expressed emotion and externalizing behaviors in adolescents and adults with autism. The findings of their study, showing a unidirectional relation between expressed emotion and problem behaviors in individuals with autism, provides support for the theory that these constructs relate and that it appears that parental expressed emotion temporally precedes child behavior problems. However, further research needs to be conducted in this area to better understand this relation, explore temporal relations, as well as to extend the findings to a younger sample of children with an ASD.

Furthermore, it is critical to control for other parenting variables known to relate to child externalizing behaviors in an effort to determine the unique variance in behavior problems attributable to expressed emotion specifically. Bader (2009) initially attempted to address these gaps in the literature in a cross-sectional study that was used as the Time 1 data for the current study.

Preliminary Findings: Time 1 Results for Current Longitudinal Study

Bader (2009) examined the relation between parental expressed emotion and externalizing behaviors in 111 children with an ASD, ages 6 to 18 years ($M = 11$, $SD = 3.53$). Each child was previously diagnosed with a DSM-IV Pervasive Developmental Disorder (i.e., ASD). The diagnoses were confirmed through a demographic and diagnostic information questionnaire and supported by a parent rating measure of autism symptom severity. Of the 111 children, 86% were male and 14% were female; 91% were White, 4% were Black, 3% were Latino, and 2% were Mixed or Other ethnicity. These

participants were sampled from autism support groups in twenty states, with the largest numbers coming from New York (26%), Mississippi (16%), and Missouri (16%). The parents, 97% mothers and 3% fathers, completed the questionnaires at a secure online survey site. The questionnaires for the Bader (2009) study included a Demographic and Diagnostic Information Questionnaire, the Child Behavior Checklist for Ages 6-18 (CBCL/6-18); the Family Questionnaire (FQ); the Children's Social Behavior Questionnaire (CSBQ); the Alabama Parenting Questionnaire (APQ); and the Parenting Stress Index –Short Form (PSI/SF).

Bader (2009) found that the sample had an average T-score of 57.31 ($SD = 10.628$) on the CBCL Externalizing composite. This was within one standard deviation of the normative mean and, although the score is somewhat elevated, the sample did not exhibit a clinically significant level of externalizing behaviors (on average), and their average level of behavior problems was lower than the mean for a referred sample within the standardization sample, which had average T-scores ranging from 64.6 (girls, ages 12 to 18) to 68.5 (boys, ages 6 to 11; Achenbach & Rescorla, 2001). Nevertheless, with a sample standard deviation of 10.628, and a range from 30 to 81, there was a subset of children in the sample that experienced clinically significant levels of externalizing behaviors. This highlighted the need to determine which variables related to more elevated levels of these behaviors.

Children in the Bader (2009) study demonstrated high levels of autism symptom severity, with an average score of 46.52 ($SD = 16.483$) on the CSBQ Total. In examining the CSBQ validation sample, the average symptom severity scores were: high functioning autism group, 47.22; PDD-NOS group, 37.84; PDD plus mental retardation, 33.64;

mental retardation group, 21.71; internalizing disorders group, 18.54; and control group, 10.28. The average level of symptom severity in the Bader (2009) study, 46.52, fell between the average level of symptom severity for the high functioning autism group, 47.22, and the PDD-NOS group, 37.84 (Bader, 2009). This measure provided a criterion check to the parent report that the child was diagnosed with an ASD.

Parents in the Bader (2009) study demonstrated borderline to high levels of expressed emotion, although it is important to note that the Family Questionnaire (FQ) was established with parents of an individual with schizophrenia, not an ASD (the FQ is a well-validated measure of expressed emotion in questionnaire format). On the FQ Criticism/Hostility scale, the average parent score was 22.41 ($SD = 5.539$), with the cut-off being above 23 for high expressed emotion (Wiedemann et al., 2002). On the FQ Overinvolvement scale, the average parent score was 27.66 ($SD = 5.026$), with the cut-off being above a 27 for high expressed emotion (Wiedemann et al.).

To examine the relation between the components of expressed emotion, symptom severity of ASD, parental distress, parenting practices, and externalizing behaviors, zero-order correlations were performed between FQ Criticism/Hostility, FQ Overinvolvement, CSBQ Total, PSI Parental Distress, APQ Positive Parenting composite, APQ Negative Parenting composite, and the criterion variable, CBCL Externalizing composite T-score (Bader, 2009). As expected, all of the variables—with the exception of the APQ Positive Parenting composite—significantly related to the CBCL Externalizing composite. It is important to note that the main predictor variables of interest, FQ Criticism/Hostility and FQ Overinvolvement, were significantly positively correlated with the CBCL Externalizing composite score, $r = .65, p < .01$ and $r = .32, p < .01$, respectively. Also,

both scales from the FQ, Criticism/Hostility and Overinvolvement, were significantly correlated, $r = .54, p < .01$. Likewise, the APQ Positive and Negative Parenting composites were significantly correlated, $r = -.26, p < .01$. Parental distress significantly related to all other variables except the Positive and Negative Parenting composites (APQ Positive Parenting composite, $r = -.12, p = .202$; APQ Negative Parenting composite $r = .17, p = .083$). Symptom severity of ASD significantly related to both constructs of expressed emotion (FQ Criticism/Hostility, $r = .44, p < .01$; FQ Overinvolvement, $r = .35, p < .01$) as well as parental distress, $r = .24, p < .01$. Symptom severity of ASD did not, however, significantly relate to parenting practices (APQ Positive Parenting composite, $r = .00, p = .969$; APQ Negative Parenting composite $r = .16, p = .090$).

Bader (2009) also performed simple correlations with demographic variables, such as child's age, child's gender, child's race, child's cognitive level, parent's gender, parent's age, parent's marital status, and total household income to see if any significantly related to externalizing behaviors. Categorical variables were dichotomized (e.g., race was coded as White or Non-White) before calculating correlation coefficients. Only child's age, $r = -.21, p < .05$, parent's age, $r = -.26, p < .01$, and total family income, $r = -.28, p < .01$, significantly related to the CBCL Externalizing composite. These correlations showed that younger children, children of younger parents, and children from families with lower household incomes experienced more disordered or non-normative externalizing behaviors. Thus, only these three demographic variables (child's age, parent's age, and total family income) were controlled for in further analyses. In addition, autism symptom severity, parental distress, and parenting practices were used as control variables based on an *a priori* decision.

In order to answer the question of whether the two subscales of expressed emotion (criticism/hostility and overinvolvement) uniquely related to externalizing behaviors in children with an ASD, Bader (2009) conducted a hierarchical multiple regression analysis (Aiken & West, 1991; Baron & Kenny, 1986) controlling for symptom severity of ASD, parental distress, parenting practices, and the significantly related demographic variables, which included child's age, parent's age, and total family income. The criterion variable was the CBCL Externalizing composite scale. In step one, child's age, parent's age, total family income, symptom severity of ASD (CSBQ Total), PSI Parental Distress, and the APQ Positive and Negative Parenting composites were entered. In step two, FQ Criticism/Hostility and FQ Overinvolvement were simultaneously entered. Results revealed that step 2 predicted significant additional variance in the CBCL Externalizing composite, $F(9, 101) = 18.342, p < .01; R^2\Delta = .151$. Indeed, after controlling for the demographics and other parenting variables, parental expressed emotion still accounted for 15.1% of the variance in child externalizing behaviors. An examination of the beta-weights indicated that FQ Criticism/Hostility significantly and uniquely predicted the CBCL Externalizing composite, $\beta = .552, p < .01$, even when controlling for all other variables, whereas FQ Overinvolvement did not, $\beta = -.152, p < .10$ (Bader). Notably, although the zero-order correlation between FQ Overinvolvement and CBCL Externalizing composite was significant and positive, $r = .32, p < .01$, the direction of the relation between these two variables was negative once the other variables were entered into the regression analysis. This finding was not interpreted, however, given that the relation was non-significant.

In order to look at possible moderators in the relation between expressed emotion and externalizing behaviors, moderated multiple regression analyses (Holmbeck, 1997) were performed looking at whether the related demographic variables (child's age, parent's age, and total family income) or the *a priori* control variables (severity of ASD symptoms, parental distress, and parenting practices) moderated the relation between criticism/hostility or overinvolvement and externalizing behaviors in children with an ASD. Specifically, interaction terms (e.g., child's age, parent's age, total family income, severity of ASD symptoms, parental distress, positive parenting practices, and negative parenting practices by both criticism/hostility and overinvolvement) were computed after centering both variables in each interaction term. All interaction terms were entered in the respective step 3 after the appropriate control variables and main effects. The only significant interaction terms were child's age by overinvolvement, $F(10, 100) = 17.718, p < .01; R^2\Delta = .019, \beta = -.145$; and parental distress by overinvolvement, $F(10, 100) = 18.017, p < .01; R^2\Delta = .023, \beta = .155$ (Bader, 2009).

In order to further assess whether child's age or parental distress moderated the relation between overinvolvement and externalizing behaviors, reduced model multiple regression analyses were performed. Results of these regression analyses indicated that neither child's age nor parental distress moderated the relation between overinvolvement and externalizing behaviors when the controls were excluded from the model, thus, neither relation was further explored as per Holmbeck (2002).

Overall, the results from Bader (2009) indicated that parental expressed emotion, particularly the criticism/hostility component, relates to externalizing behaviors among children and adolescents with an ASD. Establishing these relations, even when

controlling for other parenting variables known to relate to child externalizing behaviors, provides a more rigorous test of the question of whether expressed emotion relates to externalizing behaviors among individuals with an ASD and extends the findings to a more homogenous (ASD only) and younger population than much of the preceding research. Furthermore, these findings provide some initial support for the theory that the behavior of children with an ASD may be explained by the valence in their parents' emotional response. Parents who exhibit higher levels of criticism/hostility likely react to their children's externalizing behaviors in a more emotional manner than those with low expressed emotion. This emotional reaction, with its reinforcing property of attention, could then serve to exacerbate both the frequency and intensity of the children's externalizing behaviors. In other words, parents' overly strong emotional reactions to a behavior becomes a precursor for higher levels of externalizing behaviors in the future, thus beginning a negative cycle (i.e., the parents respond with a strong emotional valence, which leads to an increase in the frequency and/or severity of the children's behaviors, which leads the parents to respond even more emotionally, and so forth).

However, the questions of the stability of this relation and the temporal sequencing of this relation remain unanswered by Bader (2009) and are important to determine in an effort to provide further evidence for this theory. Particularly, it is not possible to conclude whether parental expressed emotion precedes child externalizing behaviors or whether child externalizing behaviors precedes parental expressed emotion. It is also not possible to conclude whether one can predict change in the other. Because such knowledge has important implications, the next step in this line of research is to

examine these relations in a longitudinal design, which was the purpose of the current study.

Current Study

Theoretically, the relation between expressed emotion and externalizing behaviors in children with an ASD can be explained by the valence in the parents' emotional response to their children's behaviors, contributing to a negative cycle (e.g., McCarty et al., 2004). Parents with higher criticism/hostility are more likely to react to their children's externalizing behaviors in a more emotional manner than those with low expressed emotion. This emotional reaction then could exacerbate the children's externalizing behaviors as they find the attention reinforcing, thus increasing the frequency and intensity of the externalizing behavior. That is, parental attention, albeit critical and hostile, is contingent on the externalizing behaviors. To clarify, whereas the children's negative behaviors may exist initially, the valence of the parents' emotional responses to these initial behaviors leads to an increase in the intensity and severity of the children's negative behaviors, especially as the reinforcing properties of the parents' responses increases the strength of this relation over time.

Parental overinvolvement, however, is a more constant, stable level of high attention that is based primarily in the parents' perceptions that their children are particularly dependent on them due to the symptoms of their disorder (i.e., not a reaction to day-to-day behaviors). Therefore, if the cycle between parental expressed emotion and child externalizing behaviors is due to the reinforcing nature of the parental reaction, it would be expected that criticism/hostility would be more strongly related to child behaviors. Indeed, preliminary empirical evidence supports the existence of a cycle

between parental criticism/hostility and child externalizing behaviors, whereas the evidence for this cycle is less clear for the overinvolvement component of expressed emotion, particularly in research conducted with children with ASDs and other developmental disorders (e.g., Bader, 2009; Greenberg et al., 2006; Hastings et al., 2006).

The current study will broaden the current literature on the relation between parental expressed emotion and externalizing behaviors in children with an ASD by allowing directional relations to be assessed, due to the longitudinal design, on a younger, more homogeneous ASD sample. This design and establishing directional relations, especially if the findings support a unidirectional relation, allows for a more robust test of the theory of a causal relation in establishing a temporal sequencing, which in turn can have important clinical implications in the treatment of externalizing behaviors in children with an ASD. Also, by assessing both components of parental expressed emotion (i.e., parental criticism/hostility and parental overinvolvement), the current study controlled for parental overinvolvement to perform a more robust test examining the unique role that parental criticism/hostility plays in predicting externalizing behaviors. By controlling other parenting factors, including parental overinvolvement, the current study may provide further support that parental criticism/hostility is a unique and useful predictor.

The current study sought to build on the Bader (2009) study, which established a relation between parental expressed emotion and externalizing behaviors in children with an ASD, by adding a second time point of data collection so that both the stability of the relations and the temporal sequencing of the relations could be examined. Through a longitudinal design, two central hypotheses were tested. Whereas no *a priori* hypotheses

were made regarding parental overinvolvement, it was included in all relevant analyses, serving as a control in assessing the unique properties of parental criticism/hostility in predicting externalizing behaviors.

First, it was hypothesized that high levels of the expressed emotion component, parental criticism/hostility, not parental overinvolvement, at Time 2 would uniquely relate to high levels of externalizing behaviors in children with an ASD at Time 2, even after controlling for severity of ASD symptoms, parental distress, parenting practices, and any additional demographic variables (e.g., child's age) found to relate to externalizing behaviors. Such a finding would establish the stability of the relation found between parental expressed emotion and child externalizing behaviors in Bader (2009) using Time 1 data. If supported, this hypothesis would expand on previous studies that found stability of this relation in adolescent/adult child samples (Greenberg et al., 2006; Hastings et al., 2006). Second, it was hypothesized that parental expressed emotion, specifically criticism/hostility at Time 1, would significantly relate to a change in externalizing behaviors from Time 1 to Time 2, even after controlling for Time 1 severity of ASD symptoms, parental distress, parenting practices, and any demographic variables (e.g., child's age) found to relate to Time 2 externalizing behaviors (i.e., the outcome). Furthermore, to examine change in externalizing behaviors, Time 1 externalizing behaviors were entered as a control. As Greenberg and colleagues found, this relation was not predicted to hold in the opposite direction; externalizing behaviors at Time 1 were not hypothesized to significantly relate to a change in parental expressed emotion (neither criticism/hostility nor overinvolvement) at Time 2. More specifically, it was hypothesized that children with an ASD living in family environments characterized by

higher parental expressed emotion would display increasingly more severe externalizing behaviors over time than children living in lower expressed emotion families, controlling for severity of ASD symptoms, parental distress, parenting practices, and any additional demographic variables (e.g., child's age) found to relate to externalizing behaviors. Such a finding would establish the temporal sequencing of the relation found between parental expressed emotion and child externalizing behaviors in Bader. If the hypothesis is supported, it would demonstrate that parental expressed emotion can predict an increase in child externalizing behaviors.

Finally, the current study also explored the control variables (at Time 1 for the longitudinal analyses and at Time 2 for the cross-sectional analyses), such as severity of ASD symptoms, parental distress, parenting practices, and any demographic variables (e.g., child's age) found to relate to externalizing behaviors as possible moderators in the relation both between components of parental expressed emotion and externalizing behaviors for the cross-sectional analyses and between components of parental expressed emotion and change in externalizing behaviors for the longitudinal analyses. These control variables were also explored to examine whether they moderated the relation between Time 1 externalizing behaviors and change in parental criticism/hostility and overinvolvement from Time 1 to Time 2. The analyses to test for these possible interactions, were conducted both cross-sectionally (at Time 2) and longitudinally (change from Time 1 to Time 2) and are considered to be exploratory research questions; thus, no specific *a priori* hypotheses are made. Both parental criticism/hostility and overinvolvement were explored as predictors in these interactions. Criticism/hostility was the component of expressed emotion of focus for the current study. Overinvolvement

related to child externalizing behaviors at Time 1 (Bader, 2009), but not when other control variables were entered, suggesting that it only relates due to shared variance with the control variables. Thus, it was also explored to see if any of those variables moderated the relation.

CHAPTER III

METHODOLOGY

Participants

Data for the current study were collected from 84 parents of a child with an ASD. These 84 parents were recruited from the sample of 111 parents who participated in the Bader (2009) study, which was used as Time 1 for the current study. Out of the 111 parents that participated in the study at Time 1, seven were not recruited for Time 2 data collection because their child was older than 18 years, which was deemed too old for inclusion because of the norms available for the study measures. All families that participated at Time 1 consented to being contacted again for future studies and provided their contact information, and 100% of the families targeted for recruitment at Time 2 were able to be reached to inform them of the Time 2 data collection. Two years elapsed between when Time 1 and Time 2 data were collected, Winter/Spring 2008 and Winter/Spring 2010, respectively.

Of the 104 parents that were contacted for Time 2 data collection, one parent expressed that she did not wish to participate, 15 parents agreed when contacted but did not begin the questionnaires, and four parents began the study but did not complete the questionnaires. There did not appear to be anything unique about those who did not begin or complete the questionnaires. Specifically, in looking at independent samples *t*-tests there were no significant differences between those who did and did not complete the questionnaires at Time 2 on major demographic variables, including child's age, $t(109) = .551, p = .583$, child's gender, $t(109) = -.801, p = .425$, child's race, $t(109) = 1.269, p = .207$, child's level of cognitive functioning, $t(109) = .930, p = .355$, parental age, $t(109) =$

-.947, $p = .346$, and total family income, $t(109) = -.856$, $p = .394$. There were also no significant differences between those who did and did not complete the questionnaires at Time 2 on any of the variables of interest, including child externalizing behaviors, $t(109) = .961$, $p = .339$, ASD symptom severity, $t(109) = .301$, $p = .764$, parental distress, $t(109) = -.169$, $p = .866$, parental criticism/hostility, $t(109) = .032$, $p = .974$, parental overinvolvement, $t(109) = .520$, $p = .604$, positive parenting practices, $t(109) = .267$, $p = .790$, and negative parenting practices, $t(109) = 1.152$, $p = .252$.

The 84 children with an ASD ranged in age from 8 to 18 years ($M = 13$, $SD = 3.27$). Each child was independently diagnosed with a DSM-IV Pervasive Developmental Disorder (i.e., ASD), as described below. Of the 84 children, 87% were male and 13% were female; 88% were White, 5% were Black, 4% were Latino and 3% were Mixed or Other ethnicity. The participants were originally sampled from autism listservs, websites, and support groups across the country. At the Time 2 data collection, the participants lived in 23 different states, which included New York (23%), Missouri (19%), Mississippi (18%), New Jersey (6%), Ohio (6%), Louisiana (4%), North Dakota (4%), Arkansas (2%), Iowa (2%), Kansas (2%), Michigan (2%), California (1%), Colorado (1%), Connecticut (1%), Florida (1%), Illinois (1%), Indiana (1%), Kentucky (1%), North Carolina (1%), Tennessee (1%), Texas (1%), Utah (1%), and Washington (1%).

Of the 84 parents completing the questionnaires, 96% were mothers of the child and 4% were fathers. At Time 2, parental ages ranged from 32 to 58 years ($M = 45$, $SD = 6.35$); 82% of the current sample was married, 11% divorced, 5% never married and living alone, and 2% separated. It was reported that, at Time 2, 38% made \$100,000 and above annually, 19% made between \$75,000 and \$99,999, 20% made between \$50,000

and \$74,999, 10% made between \$35,000 and \$49,999, 5% made between \$25,000 and \$34,999, 6% made between \$15,000 and \$24,999, 1% made between \$10,000 and \$14,999, and 1% made less than \$14,999. In reference to the highest level of education completed by the parent completing the questionnaire, at Time 2, 24% had a graduate degree, 38% had a bachelor's degree, 34% had some college or specialized training, and 4% had a high school diploma. In reference to the highest level of education completed by their spouses, at Time 2, 20% had a graduate degree, 25% had a bachelors degree, 21% had some college or specialized training, 12% had a high school diploma, 4% had some high school, 1% had some junior high school, and 1% had a 6th grade education or less (16% did not have a spouse living in the household).

To qualify for the study, the child with an ASD had to be currently living in the home with the family (i.e., the child neither lived in a group home nor was institutionalized). A diagnosis of an ASD was confirmed through parental data provided on the Demographic and Diagnostic Information Questionnaire, and at Time 2, 37% were diagnosed with Asperger's, 39% with Autism, and 24% with PDD-NOS. Children were diagnosed between the ages of 1 and 14 years, with a mean age of diagnosis of 5 years old ($SD = 3.21$). Over 60% were diagnosed before the age of five, with 80% being diagnosed by the age of eight. The modal age of diagnosis was from two to four years. Of the ASD diagnoses, 43% were made by a psychologist, 25% by a neurologist, 17% by a psychiatrist, 13% by a pediatrician, and 2% by another professional. In addition to an ASD, according to parent report, at Time 2, 35% of the current sample were also diagnosed with ADHD, 31% with an anxiety disorder, 16% with a learning disability, 13% with ODD, 11% with depression, 7% with Mental Retardation, 4% with Conduct

Disorder, 37% with another diagnosis not listed, and 33% with no diagnoses other than an ASD. When asked to rate their child's overall level of cognitive functioning, 16% said "Well Below Average," 28% said "Below Average," 27% said "Average," 13% said "Above Average," and 16% said "Well above Average." Although this is the parents' rating of their perception of their children's levels of cognitive functioning (and not a direct measure of cognitive functioning), it does indicate that, overall, this sample appears to be relatively high functioning.

In reference to school placement, 33% were placed in a regular class; however, this placement did include special services such as an aide and resource room, 20% were placed in an inclusion classroom, 19% in a self-contained classroom, 18% in an out-of-district placement specializing in children with an ASD, and 10% home schooled. When asked about special services the child had received (either currently or in the past), 37% had received Applied Behavior Analysis (ABA) therapy, 54% early intervention services, 77% occupational therapy, 35% physical therapy, 46% psychological treatment, 83% speech therapy, and 41% other services such as music therapy, hippotherapy, social skills training, art therapy, dance therapy, and specialized diets. In reference to medication, 32% were not on medication at the time of participation, except for allergy medications, whereas the remaining children in the sample (68%) were on various medications such as Risperdal/Risperidone, Prozac, B12 Shots, Elavil, Strattera, Concerta, Abilify, Focalin XR, Intuniv, Zoloft, Trileptal, Melatonin, Trazodone, Clonidine, Clonazepam, Depakote, Seroquel, Vyvanse, and Tenex, among others.

Parents were also asked to list any significant life changes that have occurred in the past two years and to rate each change on a scale of 1 to 5, with 1 being *not at all or*

very little and 5 being *significantly affected*, how much they felt it impacted their child. Fifty-one of the participants described at least one significant life change. Common significant life changes included moving to a new house, changing schools or being pulled out of school, death of a grandparent, parental divorce, and change in parents' employment. Out of the 51 families that experienced a significant life change, the average effect it had on the child with an ASD was 2.85 (17.6% rated "1," 27.5% rated "2," 23.5% rated "3," 11.8% rated "4" and 19.6% rated "5"). In some of the situations, such as going to a new school and moving, the effect was positive. This information is included for descriptive purposes.

Measures

Child Behavior Checklist for Ages 6-18 (CBCL/6-18; Achenbach & Rescorla, 2001)

The Child Behavior Checklist for ages 6 to 18 years is a broadband measure of child psychopathology commonly used in clinical research (Achenbach & Rescorla, 2001). As this measure is copyrighted, a license was purchased in order to use it online for the sample size and duration of the current study. The measure consists of 113 items for children between the ages of 6 and 18 pertaining to behavior and emotional problems. All items are scored on a 3-point Likert scale ranging from 0 to 2 with 0 being *Not True (as far as you know)*, 1 being *Somewhat or Sometimes True*, and 2 being *Very True or Often True*. Examples of questions include, "argues a lot," "disobedient at home," "disobedient at school," "doesn't seem to feel guilty after misbehaving," and "threatens people" (Achenbach & Rescorla). The scores load onto eight syndrome scales; Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive

Behavior (Achenbach & Rescorla). Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints then load onto the Internalizing Problems composite T-score, and Rule-Breaking Behavior and Aggressive Behavior load onto the Externalizing Problems composite T-score. All eight syndrome scales also load onto the Total Problems composite score (Achenbach & Rescorla). In the current study, the Externalizing Problems composite was used in the analyses as the measure of externalizing behaviors in children with an ASD. As recommended by Achenbach and Rescorla for analyzing composites in research, the T-score was used for this variable.

The CBCL/6-18 yields norm-based T-scores, with a mean of 50 and standard deviation of 10. A T-score below 65 is considered in the normal range (93rd percentile and less), from 65 to 70 is considered in the borderline clinical range (from the 93rd to 97th percentile), and 70 or higher is considered in the clinical range (98th percentile and higher; Achenbach & Rescorla, 2001). The average T-scores for referred children on the Externalizing Problems composite score are $M = 68.5$, $SD = 9.7$ and $M = 65.6$, $SD = 9.9$ for boys ages 6 to 11 and 12 to 18, respectively; and $M = 65.7$, $SD = 11.6$ and $M = 64.6$, $SD = 10.3$ for girls ages 6 to 11 and 12 to 18, respectively (Achenbach & Rescorla). These elevated T-scores for referred children demonstrate validity of the Externalizing Problems composite. In order to further assess the validity of the CBCL scales, they were correlated with the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 2004) scales. All composite scores had a strong correlation with the BASC scores; particularly relevant to the current study, the CBCL Externalizing composite score demonstrated a strong correlation with the BASC scales, $r = .89$ for mother respondents and $r = .85$ for father respondents. The Externalizing Problems composite

score has also been shown to have excellent test-retest reliability and internal consistency, $r = .92$ and $\alpha = .94$, respectively (Achenbach & Rescorla). In the current sample, the Externalizing Problems composite score also showed good internal consistency, $\alpha = .90$ (Time 1) and $\alpha = .87$ (Time 2).

The Family Questionnaire (FQ; Wiedemann, Rayki, Feinstein, & Hahlweg, 2002; Appendix A)

The Family Questionnaire is a brief scale assessing expressed emotion. The family member rates how each statement relates to them on a 4-point Likert scale (*Never/very rarely, Rarely, Often, Very often*). The FQ has 20 questions, 10 pertaining to the scale of Criticism/Hostility (e.g., “He/She does some things out of spite” and “I’m often angry with him/her;” Wiedemann et al., 2002). The other 10 pertain to the scale of Emotional Overinvolvement (e.g., “I have given up important things in order to be able to help him/her” and “I regard my own needs as less important;” Wiedemann et al.).

Both scales on the Family Questionnaire have demonstrated good reliability and validity in families of patients diagnosed with schizophrenia. Test-retest reliability was assessed after a two-week interval with a Pearson’s $r = .84$, $p < .01$, for the Criticism/Hostility scale, and a Pearson’s $r = .91$, $p < .01$, for the Emotional Overinvolvement scale. Both scales also showed good internal consistency, though Criticism/Hostility ($\alpha = .92$ for the first sample and $.90$ for the second sample assessed) was more homogeneous than Emotional Overinvolvement ($\alpha = .80$ for the first sample and $.82$ for the second sample assessed; Wiedemann et al., 2002). In the current sample, both scales also showed good internal consistency with $\alpha = .88$ (Time 1) and $\alpha = .87$

(Time 2) for the criticism/hostility scale and $\alpha = .82$ (Time 1) and $\alpha = .80$ (Time 2) for the emotional overinvolvement scale.

The Family Questionnaire was developed as a more time efficient means of assessing expressed emotion as compared to the Camberwell Family Interview (CFI), which has been the standard measure used in the assessment of expressed emotion (Vaughn & Leff, 1976) as well as the Five-Minute Speech Sample. In order to minimize inaccurate responses, the questions in the FQ were worded intentionally so that the negative responses would not be conceptualized as the fault of the relative, but rather being an understandable outcome of excessive stress (Wiedemann et al., 2002).

Wiedemann and colleagues (2002) conducted a validation study of the FQ against the CFI, the standard measure of expressed emotion. In this validation study, there was a high degree of agreement found between the full scale of the FQ and the CFI. When using one informant, 73 of 95, or 76.8% of the participants, were correctly classified. Of these 95 participants, 55 were rated as high-EE by the CFI and 44 by the FQ, whereas 40 were rated low-EE by the CFI and 29 by the FQ (Wiedemann et al.). These findings show that, in comparison with the CFI, the FQ total is 80% accurate in identifying high-EE and 72.5% accurate in identifying low-EE, with a total accuracy of 74.3%; the FQ Criticism/Hostility is 68% accurate in identifying high-Criticism/Hostility and 85% accurate in identifying low-Criticism/Hostility, with a total accuracy of 78%; and the FQ Emotional Overinvolvement is 80% accurate in identifying high-Overinvolvement and 64% accurate in identifying low-Overinvolvement, with a total accuracy of 71% (Wiedemann et al.).

Children's Social Behavior Questionnaire (CSBQ; Hartman, Luteijn, Serra, & Minderaa, 2006; Appendix B)

The Children's Social Behavior Questionnaire is a measure of autistic symptom severity (Luteijn, Luteijn, Jackson, Volkmar, & Minderaa, 2000). The Children's Social Behavior Questionnaire was developed in 1994, and an initial brief report on the properties of the CSBQ published in 1998 (Luteijn, Jackson, Volkmar, & Minderaa, 1998). Hartman and colleagues (2006) further refined the CSBQ to the current version addressing many of the limitations of the previous versions.

Parents rate their children, on each of the 49-items from 0 to 2, with 0 being *it does not describe the child*, 1 being *infrequently describes the child*, and 2 being *clearly applies to the child* (Luteijn et al., 2000). The CSBQ contains six scales as well as an overall severity scale. The "behavior/emotions not optimally tuned to the social situation/aggressive behavior" scale contains items such as "over-reacts to everything and everyone" and "quickly gets angry." The "reduced contact and social interest/withdrawn" scale contains items such as "has little or no need for contact with others" and "lives in a world of his/her own." The "difficulties in understanding social information" scale contains items such as "does not fully understand what is being said to him/her" and "does not understand jokes." The "orientation problems in time, place, or activity" scale contains items such as "has no sense of time" and "does things without realizing the aim." The "stereotyped behavior" scale contains items such as "is fascinated by certain colors, forms, or moving objects" and "is extremely pleased by certain movements and keeps doing them." The "fear of and resistance to changes" scale contains items such as

“panics in new situations or if change occurs” and “opposes change” (Hartman et al., 2006).

Reliability properties of the scales have been established: “Behavior/emotions not optimally tuned to the social situation/aggressive behavior” ($\alpha = .90$, ICC = .89, $r = .89$); “Reduced contact and social interest/withdrawn” ($\alpha = .85$, ICC = .79, $r = .88$); “Difficulties in understanding social information” ($\alpha = .85$, ICC = .87, $r = .80$); “Orientation problems in time, place, or activity” ($\alpha = .84$, ICC = .81, $r = .82$); “Stereotyped behavior” ($\alpha = .76$, ICC = .75, $r = .80$); and “Fear of and resistance to changes” ($\alpha = .85$, ICC = .80, $r = .83$; Hartman et al., 2006). Intercorrelations between these scales range from .32 to .59, with the highest intercorrelation being between Understanding and Orientation (Hartman et al.). For the Total Score, the internal consistency was .94, the inter-rater reliability was .86, and the test-retest reliability was .90 (Hartman et al.). A simultaneous factor analysis conducted between both the CSBQ and the CBCL demonstrated the patterns of convergent and divergent validity that were theoretically expected between the respective scales (Hartman et al.). Thus, the CSBQ appears to be a reliable and valid measure of the severity of the symptoms of autism. Consistent with Time 1 and with the scoring guidelines for the measure, a CSBQ Total Score for Time 2 was created by summing all of the items. In the current sample, the CSBQ Total Score showed good internal consistency, $\alpha = .92$ (both Time 1 and Time 2) providing further support in the reliability of the CSBQ as a measure of symptom severity of autism.

Parenting Stress Index –Short Form (PSI/SF; Abidin, 1995)

The Parenting Stress Index – Short Form is a measure of parental stress (Abidin, 1995). As this measure is copyrighted, a license was purchased in order to use it online for the sample size and duration of the current study. Parents rate their perceptions on each of the 36-items on a 5-point Likert scale, *Strongly Agree, Agree, Not Sure, Disagree, Strongly Disagree*. Parents rate the extent to which they agree or disagree with items such as “My child is not able to do as much as I expected” and “I feel alone and without friends.” Scores on the PSI/SF load onto three scales, which then yield the Total Stress score. The three scales are, Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child. The Total Stress score indicates the overall level of parenting stress the parent is experiencing across all three scales. The Parent-Child Dysfunctional Interaction scale indicates the extent to which the parent-child interaction is not reinforcing to the parent and the extent to which the parent perceives the child as not meeting their expectations. The Difficult Child scale examines the personal and behavioral characteristics of a child that makes them either easy or more difficult to manage. The two previous scales were not used in this current study due to their theoretical overlap with expressed emotion, both the FQ Criticism/Hostility and the FQ Overinvolvement scales, and the CBCL Externalizing Behaviors composite, respectively. The third PSI/SF scale (Parental Distress scale), which indicates the amount of distress the parent is experiencing in his or her role as parent as a function of his or her own personal factors, was used in the analyses of the current study (Abidin).

The Parental Distress scale has shown strong test-retest reliability and internal consistency, $r = .85$ and $\alpha = .87$, respectively (Abidin, 1995). In reference to validity,

whereas there is little research conducted directly on the PSI/SF to support its validity, its strong correlation with the full-length PSI indicates that it shares the same properties as the full-length PSI, for which validity has been well-established (Abidin). These correlations include, $r = .92$, for the correlation between the PSI/SF Parental Distress scale with the PSI Parent Domain scale (Abidin). In the current sample, based on Time 1 and Time 2 data, the Parental Distress scale demonstrated good internal consistency, $\alpha = .88$.

Alabama Parenting Questionnaire (APQ; Frick, 1991; Appendix C)

The Alabama Parenting Questionnaire is a measure of parenting practices (Frick, 1991; Shelton, Frick & Wootton, 1996). Parents rate how well each of the 42 items describes their parenting practices on a 5-point Likert scale from 1 to 5: (1) *Never*, (2) *Almost Never*, (3) *Sometimes*, (4) *Often*, and (5) *Always* (Shelton et al.). Examples of these items include; “You have a friendly talk with your child” and “You feel that getting your child to obey you is more trouble than it’s worth” (Shelton et al.). Items load onto five scales: Parental Involvement, Positive Parenting, Poor Monitoring/Supervision, Inconsistent Discipline, and Corporal Punishment. Some additional disciplinary practices included on the measure did not load on one of the five scales in the original psychometric studies (Shelton et al.). All scales except Corporal Punishment ($\alpha = .46$) showed strong internal consistency: Parental Involvement ($\alpha = .80$), Positive Parenting ($\alpha = .80$), Poor Monitoring/Supervision ($\alpha = .67$), and Inconsistent Discipline ($\alpha = .67$; Shelton et al.). In the current sample, the internal consistencies were as follows with Time 1 and Time 2 alphas being reported, respectively: $\alpha = .84$ and $.72$ for Parental Involvement, $\alpha = .72$ and $.63$ for Positive Parenting, $\alpha = .36$ and $.42$ for Poor

Monitoring/Supervision, $\alpha = .69$ and $.78$ for Inconsistent Discipline, and $\alpha = .67$ and $.67$ for Corporal Punishment. While the internal consistencies for these scales were found to be low to adequate, internal consistency analyses of the five individual scales indicated that the scale alphas would not be improved with the deletion of any one particular item from the given scale.

As was done for Time 1, Positive Parenting and Negative Parenting composite scores were created by summing the z -scores of the respective scales for the Time 2 data. The Parental Involvement and Positive Parenting scales (which correlated, $r = .42, p < .01$ at Time 1 and $r = .40, p < .01$ at Time 2) loaded onto the Positive Parenting composite. Whereas the APQ Positive Parenting composite consistently did not relate to the other constructs of interest, it was maintained in the analyses in order to replicate the analyses conducted at Time 1 and also to attempt to control for both potential risk (negative practices) and protective (positive practices) factors. The Poor Monitoring/Supervision, Inconsistent Discipline, and Corporal Punishment scales loaded onto the Negative Parenting composite. A significant correlation was found between Poor Monitoring/Supervision and Inconsistent Discipline at both Time 1 and Time 2, $r = .24, p < .05$ and $r = .32, p < .05$, respectively. Inconsistent Discipline and Corporal Punishment were significantly correlated at Time 1, $r = .31, p < .01$, but not at Time 2, $r = .13, p = .23$. Also, Poor Monitoring/Supervision and Corporal Punishment were not significantly correlated at Time 1, $r = .04, p = .710$, but were at Time 2, $r = -.23, p < .05$. The non-significant correlations may have been due to the low internal consistency of the Poor Monitoring/Supervision scale. Although the correlations involving Corporal Punishment varied in significance, Corporal Punishment was still included in this Negative Parenting

composite in order to remain consistent with Time 1 analyses as well as with the literature on other populations.

In the current sample, both composite scores showed adequate internal consistency: $\alpha = .85$ (Time 1) and $\alpha = .76$, for the Positive Parenting composite and, $\alpha = .66$ (Time 1) and $\alpha = .68$ (Time 2), for the Negative Parenting composite. Even though the Poor Monitoring/Supervision scale demonstrated low internal consistency, results of internal consistency analyses indicated that the alpha coefficient for the Negative Parenting composite would not have been substantially improved with the deletion of that scale, thus it was retained in the composite. Maintaining all scales for the two parenting composites also kept Time 2 analyses consistent with Time 1 (Bader, 2009).

Demographic and Diagnostic Information Questionnaire (Appendix D)

This extensive questionnaire was used to obtain socioeconomic, socio-cultural, diagnostic, and assessment information about the child and family. Such socioeconomic and socio-cultural information included the child and parent age, gender, race, parent marital status, education level, current employment, total family income, and a list of age, gender, relation to the child, and any diagnoses (when applicable) of everyone living in the household.

The questionnaire included confirmation of a diagnosis of an ASD. Parents reported on diagnostic classification, age of diagnosis, professional and affiliation making diagnosis (i.e., to rule-out parents merely self-reporting that they think the child has the diagnosis), treatment and medication history, current medication type/dosage, family history of ASD diagnoses, parents' rating of the child's overall level of cognitive functioning, and history and details of diagnoses of other psychological/behavioral

disorders for the child (if applicable). Parents also were asked to report if any significant life events had occurred within the last two years and the degree to which they felt it impacted their child. Due to low base rates, an *a priori* decision was made to exclude any children diagnosed with Rett's Disorder or Childhood Disintegrative Disorder; however, no children had either of these diagnoses.

Procedure

The 104 parents that participated in Time 1 whose child with an ASD was still under the age of 18 years old had consented to participate in further studies and to be contacted via email or a phone call. Parents were contacted two years after they had participated at Time 1. The researcher used Internet resources to locate new contact information for parents in the event that they could no longer be reached with the original contact information. Once consent to participate in Time 2 of the data collection had been obtained, the parents were emailed their own unique link to a survey site, where they were able to complete the questionnaires online. The participants were also given an option to have a paper copy of the measures mailed to them if preferred. Only one participant opted for this format, in which case the measures, along with a self-addressed stamped envelope was mailed to the participant. The set of questionnaires took approximately an hour to complete. The questionnaires the participants completed for the current study included the Demographic and Diagnostic Information Questionnaire, the Child Behavior Checklist for Ages 6-18 (CBCL/6-18), the Children's Social Behavior Questionnaire (CSBQ), the Family Questionnaire (FQ), the Parenting Stress Index – Short Form (PSI/SF), and the Alabama Parenting Questionnaire (APQ). Participants were

asked to complete all questionnaires at one time, but were able to return to the questionnaires at a later time if that was not possible.

CHAPTER IV

ANALYSIS OF DATA

Cross-Sectional Descriptives (at Time 2)

Cross-sectional analyses were conducted only on Time 2 data in order to replicate the findings of Bader (2009) on the Time 1 data. Descriptive statistics for each of the variables of interest at Time 2 are displayed in Table 1. A review of the descriptive statistics shows that children with an ASD in the current sample had an average T-score of 54.30 on the Time 2 CBCL Externalizing composite. This is within one standard deviation of the normative mean and, although the score is slightly elevated, the sample for the current study did not exhibit a clinically significant level of externalizing behaviors (on average), and their level of behavior problems was lower than the mean for a referred sample, with average T-scores ranging from 64.6 (girls, ages 12 to 18) to 68.5 (boys, ages 6 to 11; Achenbach & Rescorla, 2001). Nevertheless, with a sample standard deviation of 9.928, and a range from 33 to 76, there was a subset of children in the sample that experienced clinically significant levels of externalizing behaviors, highlighting the need to determine which variables relate to more elevated levels of these behaviors.

Table 1

Descriptive Statistics for Time 2 Variables of Interest

| | Mean (Standard Deviation) | Range | Skew |
|---------------------------|---------------------------|-------|-------|
| T2 CBCL Externalizing | 54.30 (9.928) | 33-76 | -.377 |
| T2 FQ Criticism/Hostility | 20.80 (5.488) | 10-39 | .321 |

Table 1 (continued).

| | Mean (Standard Deviation) | |
|---------------------------|---------------------------|-------|
| | Range | Skew |
| T2 FQ Overinvolvement | 26.20 (4.827) | |
| | 15-40 | .353 |
| T2 CSBQ Total | 38.20 (16.275) | |
| | 8-89 | .297 |
| T2 PSI Parental Distress | 29.07 (9.638) | |
| | 12-56 | .113 |
| T2 APQ Positive Parenting | 0 (.837) | |
| | -2.16-1.81 | -.127 |
| T2 APQ Negative Parenting | 0 (.619) | |
| | -1.14-1.53 | .096 |

Note. T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index. Due to the fact that the Alabama Parenting Questionnaire (APQ) Positive and Negative Parenting composites were created using average *z*-scores, the means remained zero.

A review of the descriptive statistics shows that parents of the current sample had a mean Time 2 PSI Parental Distress score of 29.07 ($SD = 9.638$). Parents with a raw score at or above 33 (which is the 85th percentile) are considered to be experiencing clinically significant levels of parental distress (Abidin, 1995). Therefore, the parents of children with an ASD in the current sample were, on average, experiencing a borderline level of clinically significant parental distress compared to parents in a general population.

Children in the current sample demonstrated high levels of autism symptom severity, with an average score of 38.20 ($SD = 16.275$) on the Time 2 CSBQ Total. In looking at the CSBQ validation sample (Hartman et al., 2006), the average symptom severity scores were: high functioning autism group, 47.22; PDD-NOS group, 37.84;

PDD plus mental retardation, 33.64; mental retardation group, 21.71; internalizing disorders group, 18.54; and control group, 10.28. The average level of symptom severity for children in the current study at Time 2 ($M = 38.20$) fell between the average level of symptom severity for the high functioning autism group, 47.22, and the PDD-NOS group, 37.84. This measure served as a criterion check for the ASD sample in the current study as not only did the sample fall within the expected range of scores, but also the average CSBQ rating of the current sample was over 3.5 times higher than the average score of the control group in the CSBQ psychometric study (Hartman et al.).

Parents in the current sample demonstrated borderline to high levels of expressed emotion, although it is important to note, again, that the Family Questionnaire (FQ) was established with parents of a child with schizophrenia, not an ASD, thus the cut-off scores are not necessarily accurate in this population. On the Time 2 Criticism/Hostility scale, the average parent score was a 20.80 ($SD = 5.488$), with the cut-off score being above 23 for high expressed emotion (Wiedemann et al., 2002). On the Time 2 Overinvolvement scale, the average parent score was 26.20 ($SD = 4.827$), with the cut-off score being above a 27 for high expressed emotion (Wiedemann et al., 2002). Other variables of interest could not be interpreted in terms of normative data or cut-scores as this information was not available.

Cross-Sectional Analyses (at Time 2)

To examine the stability, over time, of the relation between parental expressed emotion and child externalizing behaviors (first hypothesis), the same analyses were conducted on the Time 2 data that were conducted on the Time 1 data in the previous study (Bader, 2009). In looking at the relation between the components of expressed

emotion, symptom severity of ASD, parental distress, parenting practices, and externalizing behaviors, zero-order correlations were performed between FQ Criticism/Hostility, FQ Overinvolvement, CSBQ Total, PSI Parental Distress, APQ Positive Parenting composite, APQ Negative Parenting composite, with the criterion variable, CBCL Externalizing composite score, all at Time 2 (see Table 2). As expected, all of the variables except the APQ Positive Parenting composite significantly related to the CBCL Externalizing composite. It is important to note that the main predictor variables of interest, FQ Criticism/Hostility and FQ Overinvolvement, were significantly positively correlated with the CBCL Externalizing composite score, $r = .71, p < .001$ and $r = .28, p < .01$, respectively. Also, both scales from the FQ, Criticism/Hostility and Overinvolvement, were significantly correlated, $r = .36, p < .01$. The APQ Positive and Negative Parenting composites were significantly negatively correlated, $r = -.35, p < .01$. Parental distress significantly related to all other variables except the APQ Positive Parenting composite, $r = .04, p = .701$. Symptom severity of ASD significantly related to both constructs of expressed emotion (FQ Criticism/Hostility, $r = .46, p < .001$; FQ Overinvolvement, $r = .42, p < .001$) as well as parental distress, $r = .24, p < .05$. Symptom severity of ASD did not, however, significantly relate to parenting practices (APQ Positive Parenting composite, $r = -.02, p = .856$; APQ Negative Parenting composite $r = .16, p = .152$).

Table 2

Correlations among Time 2 Variables of Interest

| | 2 | 3 | 4 | 5 | 6 | 7 |
|------------------------------|--------|-------|--------|--------|------------------|--------|
| 1. T2 CBCL Externalizing | .71*** | .28** | .51*** | .29** | -.17 | .45*** |
| 2. T2 FQ Criticism/Hostility | ----- | .36** | .46*** | .37*** | -.11 | .46*** |
| 3. T2 FQ Overinvolvement | | ----- | .42*** | .51*** | .21 [†] | .06 |
| 4. T2 CSBQ Total | | | ----- | .24* | -.02 | .16 |
| 5. T2 PSI Parental Distress | | | | ----- | .04 | .30** |
| 6. T2 APQ Positive Parenting | | | | | ----- | -.35** |
| 7. T2 APQ Negative Parenting | | | | | | ----- |

[†] Trend, $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note. T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Simple correlations were also performed with demographic variables, such as child's age, child's gender, child's race, child's cognitive level, parent's gender, parent's age, parent's marital status, and total household income to determine if any were significantly related to externalizing behaviors and would, therefore, need to be entered as control variables in subsequent regression analyses. Categorical variables were dichotomized (e.g., race was coded as White or Non-White) before calculating correlation coefficients. None of the demographic variables significantly related to the Time 2 CBCL Externalizing composite (see Table 3). There was, however, a trend in the relation between total family income and the CBCL Externalizing composite; $r = -.21$, $p = .053$. Because none of the demographic variables significantly related to the outcome variable, none were controlled for in further analyses. However, based on *a priori*

decisions, autism symptom severity, parental distress, and parenting practices were used as control variables in the cross-sectional analyses.

Table 3

Correlations among Time 2 Demographic Variables and Time 2 Externalizing Behaviors

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|-------|-------|-------|-------------------|-------|--------------------|------------------|-------|---------------------|
| 1. T2 CBCL Externalizing | -.03 | -.06 | -.10 | .12 | .06 | -.12 | .14 | -.08 | -.21 [†] |
| 2. T2 Child's Age | ----- | .00 | -.02 | -.26 [*] | .01 | .43 ^{***} | .09 | .14 | -.16 |
| 3. T2 Child's Gender | | ----- | -.14 | -.06 | -.12 | -.05 | -.09 | .17 | .14 |
| 4. T2 Child's Race | | | ----- | -.07 | .07 | -.06 | .28 [*] | .17 | -.04 |
| 5. T2 Cognitive Level | | | | ----- | .13 | .07 | .22 [*] | .14 | .11 |
| 6. T2 Parent's Gender | | | | | ----- | -.13 | .08 | -.04 | .13 |
| 7. T2 Parent's Age | | | | | | ----- | .13 | .10 | -.05 |
| 8. T2 Marital Status | | | | | | | ----- | .06 | -.40 ^{***} |
| 9. T2 Parent's Education | | | | | | | | ----- | .38 ^{***} |
| 10. T2 Total Income | | | | | | | | | ----- |

[†] Trend, $p < .10$; ^{*} $p < .05$; ^{**} $p < .01$; ^{***} $p < .001$

Note. T2 = Time 2, CBCL = Child Behavior Checklist.

In order to answer the question of whether the two subscales of expressed emotion (criticism/hostility and overinvolvement) uniquely related to externalizing behaviors in children with an ASD in the Time 2 data, a hierarchical multiple regression

analysis (Aiken & West, 1991; Baron & Kenny, 1986) was conducted controlling for Time 2 symptom severity of ASD, parental distress, and parenting practices. The criterion variable was the CBCL Externalizing composite score. In step one, CSBQ Total (symptom severity of ASD), PSI Parental Distress, and both APQ Positive and Negative Parenting composites were entered. In step two, FQ Criticism/Hostility and FQ Overinvolvement were entered. Results revealed that step 2 predicted a significant amount of additional variance in the CBCL Externalizing composite, $F(6, 77) = 17.442, p < .001; R^2\Delta = .164$. Table 4 displays $R^2\Delta$ for each step and the standardized regression coefficients (β) for each variable. Indeed, after controlling for the other parenting variables, parental expressed emotion still accounted for 16.4% of the variance in child externalizing behaviors. An examination of the beta-weights indicated that FQ Criticism/Hostility significantly predicted the CBCL Externalizing composite, $\beta = .524, p < .001$, even when controlling for all other variables, whereas FQ Overinvolvement did not, $\beta = -.009, p = .928$. Notably, although the zero-order correlation between FQ Overinvolvement and CBCL Externalizing composite was significant and positive, $r = .36, p < .01$, the direction of the relation between these two variables was negative once the other variables were entered into the regression analysis indicating that the variance was actually accounted for by the control variables. This finding is not interpreted, however, given that the relation was non-significant. It is important to note that, whereas it was not hypothesized to relate to child externalizing behaviors, overinvolvement was included in all analyses to further examine the unique role criticism/hostility has in predicting externalizing behaviors (i.e., controlling for parental overinvolvement).

Table 4

Time 2 Expressed Emotion Predicting Time 2 Externalizing Behaviors in Children with an ASD

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .412^{***} |
| T2 CSBQ Total | .437 ^{***} |
| T2 PSI Parental Distress | .089 |
| T2 APQ Positive Parenting | -.042 |
| T2 APQ Negative Parenting | .342 ^{**} |
| Model 2 (Main Effects) R²Δ | .164^{***} |
| T2 FQ Criticism/Hostility | .524 ^{***} |
| T2 FQ Overinvolvement | -.009 |

** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Consistent with the planned exploratory analyses to examine the question of possible moderators in the relation between expressed emotion and externalizing behaviors in the Time 2 data, moderated multiple regression analyses (Holmbeck, 1997) were performed looking at whether severity of ASD symptoms, parental distress, or parenting practices moderated the relation between criticism/hostility and overinvolvement and externalizing behaviors in children with an ASD. Specifically, interaction terms (severity of ASD symptoms, parental distress, positive parenting practices, and negative parenting practices by both criticism/hostility and overinvolvement) were computed after centering both variables in each interaction term

to control for multicollinearity between the predictor and moderator and their interaction as well as to facilitate interpretation of post-hoc tests (Holmbeck, 2002). All interaction terms were entered in the respective step 3 after the appropriate control variables and main effects (see Tables 5 through 10). An inspection of Table 5 through 10 indicates that the only significant interaction term was ASD symptom severity by criticism/hostility, $F(6,77) = 19.286, p < .001; R^2\Delta = .024, \beta = -.168$ (see Table 5).

Table 5

Interaction between Time 2 Criticism/Hostility and Time 2 ASD Symptom Severity in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R^2 | .233^{***} |
| T2 PSI Parental Distress | .179 [†] |
| T2 APQ Positive Parenting | -.040 |
| T2 APQ Negative Parenting | .384 ^{**} |
| Model 2 (Main Effects) $R^2\Delta$ | .343^{***} |
| T2 CSBQ Total | .238 ^{**} |
| T2 FQ Criticism/Hostility | .523 ^{***} |
| Model 3 (Interaction) $R^2\Delta$ | .024[†] |
| T2 CSBQ Total X T2 FQ Criticism/Hostility | -.168 [*] |

[†] Trend, $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 6

Interaction between Time 2 Criticism/hostility and Time 2 Parental Distress in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .405^{***} |
| T2 CSBQ Total | .454 ^{***} |
| T2 APQ Positive Parenting | -.028 |
| T2 APQ Negative Parenting | .371 ^{***} |
| Model 2 (Main Effects) R²Δ | .171^{***} |
| T2 PSI Parental Distress | -.006 |
| T2 FQ Criticism/Hostility | .523 ^{***} |
| Model 3 (Interaction) R²Δ | .004 |
| T2 PSI Parental Distress X T2 FQ Criticism/Hostility | -.065 |

** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 7

Interaction between Time 2 Criticism/Hostility and Time 2 Parenting Practices in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Controls) R² | .294^{***} |
| T2 CSBQ Total | .470 ^{***} |
| T2 PSI Parental Distress | .182 [†] |

Table 7 (continued).

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 2 (Main Effects) $R^2\Delta$ | .282^{***} |
| T2 APQ Positive Parenting | -.049 |
| T2 APQ Negative Parenting | .155 [†] |
| T2 FQ Criticism/Hostility | .523 ^{***} |
| Model 3 (Interactions) $R^2\Delta$ | .010 |
| T2 APQ Positive Parenting X T2 FQ Criticism/Hostility | -.086 |
| T2 APQ Negative Parenting X T2 FQ Criticism/Hostility | -.063 |

[†] Trend, $p < .10$; ** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, neither Time 2 positive parenting practices nor Time 2 negative parenting practices significantly moderated the relation between Time 2 parental criticism/hostility and Time 2 child externalizing behaviors in these separate analyses.

Table 8

Interaction between Time 2 Overinvolvement and Time 2 ASD Symptom Severity in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R^2 | .233^{***} |
| T2 PSI Parental Distress | .179 [†] |
| T2 APQ Positive Parenting | -.040 |
| T2 APQ Negative Parenting | .384 ^{**} |
| Model 2 (Main Effects) $R^2\Delta$ | .182^{***} |
| T2 CSBQ Total | .414 ^{***} |

Table 8 (continued).

| | T2 CBCL Externalizing |
|---|--------------------------|
| T2 FQ Overinvolvement | .070 |
| Model 3 (Interaction) R²Δ | .000 |
| T2 CSBQ Total X T2 FQ Overinvolvement | .021 |

† Trend, $p < .10$; ** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 9

Interaction between Time 2 Overinvolvement and Time 2 Parental Distress in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .405^{***} |
| T2 CSBQ Total | .454 ^{***} |
| T2 APQ Positive Parenting | -.028 |
| T2 APQ Negative Parenting | .371 ^{***} |
| Model 2 (Main Effects) R²Δ | .010 |
| T2 PSI Parental Distress | .058 |
| T2 FQ Overinvolvement | .070 |
| Model 3 (Interaction) R²Δ | .000 |
| T2 PSI Parental Distress X T2 FQ Overinvolvement | -.012 |

** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 10

Interaction between Time 2 Overinvolvement and Time 2 Parenting Practices in Predicting Time 2 Externalizing Behaviors

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Controls) R² | .294^{***} |
| T2 CSBQ Total | .470 ^{***} |
| T2 PSI Parental Distress | .182 [†] |
| Model 2 (Main Effects) R²Δ | .120^{**} |
| T2 APQ Positive Parenting | -.054 |
| T2 APQ Negative Parenting | .346 ^{**} |
| T2 FQ Overinvolvement | .070 |
| Model 3 (Interactions) R²Δ | .006 |
| T2 APQ Positive Parenting X T2 FQ Overinvolvement | -.005 |
| T2 APQ Negative Parenting X T2 FQ Overinvolvement | .076 |

† Trend, $p < .10$; ** $p < .01$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, neither Time 2 positive parenting practices nor Time 2 negative parenting practices significantly moderated the relation between Time 2 parental overinvolvement and Time 2 child externalizing behaviors in these separate analyses.

In order to further assess whether ASD symptom severity moderated the relation between criticism/hostility and externalizing behaviors, a reduced model multiple regression analysis, including only the main effects and interaction, was performed. Results of this regression indicated that ASD symptom severity did moderate the relation between criticism/hostility and externalizing behaviors when the controls were excluded

from the model; $F(3, 80) = 37.507, p < .001; R^2\Delta = .034, \beta = -.190$ (see Table 11). This interaction was plotted according to Holmbeck (2002; see Figure 1). The plot indicates that there was a main effect of both ASD symptom severity and Parental Criticism/Hostility. Both higher levels of ASD symptom severity and higher levels of parental criticism/hostility were associated with higher levels of externalizing behaviors. However, the interaction revealed that the highest levels of externalizing behaviors were among those children exhibiting higher levels of parental criticism/hostility, regardless of autism symptom severity. It also revealed that low parental criticism/hostility served as a protective factor for children, especially for those with high levels of ASD symptom severity.

Table 11

Interaction between Time 2 Criticism/Hostility and Time 2 ASD Symptom Severity in Predicting Time 2 Externalizing Behaviors (Reduced Model)

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Main Effects) R^2 | .551^{***} |
| T2 CSBQ Total | .235 ^{**} |
| T2 FQ Criticism/Hostility | .604 ^{***} |
| Model 2 (Interaction) $R^2\Delta$ | .034[*] |
| T2 CSBQ Total X T2 FQ Criticism/Hostility | -.190 [*] |

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

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire.

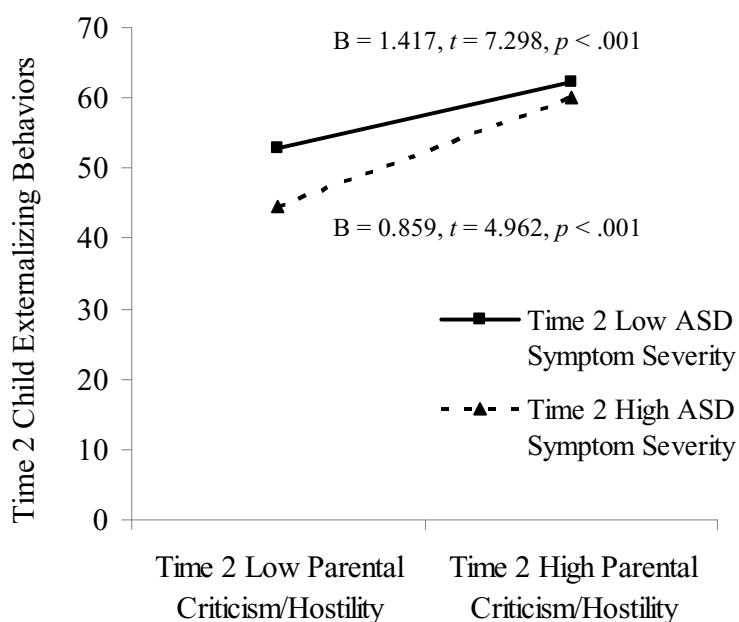


Figure 1. Interaction between Time 2 ASD symptom severity and Time 2 parental criticism/hostility in predicting Time 2 externalizing behaviors in children with an ASD.

Longitudinal Descriptives

Longitudinal analyses were conducted to examine directional relations between variables. First, in order to descriptively examine the change in the variables over two years, from Time 1 to Time 2, change variables were calculated (Time 2 – Time 1). Descriptive statistics for the change in each of the variables of interest are displayed in Table 12. To examine stability in the constructs across time, paired samples *t*-tests were conducted to further examine whether the change from Time 1 to Time 2 of each variable was significant. Results of these paired samples *t*-tests showed that the difference in scores between Time 1 and Time 2 was significant, typically showing improvement across time. Specifically, Time 2 was significantly lower compared to Time 1 for CBCL Externalizing, $t(83) = -2.255, p < .05$, FQ Criticism/Hostility, $t(83) = -3.070, p < .01$, FQ Overinvolvement, $t(83) = -3.211, p < .01$, CSBQ Total, $t(83) = -6.114, p < .001$, and PSI

Parental Distress, $t(83) = -2.744, p < .05$. Only the APQ Positive composite and the APQ Negative composite did not show significant changes across time, $t(83) = .001, p = 1.0$ and $t(83) = .006, p = .995$, respectively.

Table 12

Descriptive Statistics for Change in Variables of Interest (Time 1 to Time 2)

| | Mean (Standard Deviation) | |
|----------------------------------|---------------------------|--------|
| | Range | Skew |
| Change in CBCL Externalizing | -2.13 (8.662) | |
| | -24-26 | .447 |
| Change in FQ Criticism/Hostility | -1.57 (4.691) | |
| | -16-9 | -.563 |
| Change in FQ Overinvolvement | -1.41 (4.009) | |
| | -16-6 | -.761 |
| Change in CSBQ Total | -8.21 (12.313) | |
| | -51-17 | -.574 |
| Change in PSI Parental Distress | -2.45 (8.191) | |
| | -41-12 | -1.538 |
| Change in APQ Positive Parenting | 0 (.643) | |
| | -1.25-2 | .400 |
| Change in APQ Negative Parenting | 0 (.478) | |
| | -1.52-1.09 | -.254 |

Note. CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index. Due to the fact that the Alabama Parenting Questionnaire (APQ) Positive and Negative Parenting composites were created using average z-scores, the mean change scores remained zero; however, this does not reflect a lack of change in these variables. Actually, the APQ Parental Involvement and the APQ Poor Monitoring scales increased (Mean change = .029 and .056, respectively), whereas the APQ Positive Parenting, Inconsistent Discipline, and Corporal Punishment scales decreased (Mean change = -.010, -.022, and -.139 respectively).

A review of the descriptive statistics shows that the average T-score of the CBCL Externalizing composite decreased by 2.131 ($SD = 8.662$) at Time 2. Whereas the

average change in CBCL Externalizing composite decreased, the range of change scores was from -24 to 26, indicating that some children's externalizing behaviors did increase over the two years. The change in the CSBQ total also shows that the children's ASD symptom severity decreased over time ($M = -8.214$, $SD = 12.313$), with a range of change scores from -51 to 17. Decreases in problematic behaviors—as was observed from Time 1 to Time 2 in this sample—have been documented in externalizing behaviors with typical maturation among young children aged 2 to 5 years (Mesman et al., 2009) and among school-aged children (Prinz, Onghena, & Hellinckx, 2006) as well as in symptoms of autism and maladaptive behaviors among adolescents and adults with autism (e.g., Shattuck et al., 2007).

From Time 1 to Time 2, the mean change in FQ Criticism/Hostility was -1.571 ($SD = 4.691$), the mean change in FQ Overinvolvement was -1.405 ($SD = 4.010$), and the mean change in PSI Parental Distress was -2.45 ($SD = 8.191$). Whereas the average of each of these previous variables decreased, it is important to note that there were parents who did experience an increase in parental distress, criticism/hostility, and overinvolvement. Because the parenting composites were based on averages of z-scores and, therefore, the change scores between Time 1 and Time 2 were 0, it was necessary to examine change in the scale raw scores. In looking at the change in the scales of the APQ that were used to create the Positive Parenting composite, the APQ Parental Involvement scale increased ($M = .029$, $SD = .471$) and the APQ Positive Parenting scale decreased ($M = -.010$, $SD = .391$) from Time 1 to Time 2. In looking at the change in the scales of the APQ that were used to create the Negative Parenting composite, the APQ Poor Monitoring scale increased ($M = .056$, $SD = .256$), whereas the Inconsistent Discipline

scale and the Corporal Punishment scale decreased ($M = -.022$, $SD = .511$ and $M = -.139$, $SD = .395$, respectively) from Time 1 to Time 2.

Correlations among the change scores are presented in Table 13. Whereas most variables of interest significantly decreased from Time 1 to Time 2, the relation between the variables remained positive. The change in CBCL Externalizing significantly related to change in FQ Criticism/Hostility, change in CSBQ Total, and change in APQ Negative Parenting ($r = .41$, $p < .001$; $r = .48$, $p < .001$; and $r = .30$, $p < .01$ respectively). Change in FQ Criticism/Hostility also significantly related to change in FQ Overinvolvement, change in CSBQ Total, and change in APQ Negative Parenting ($r = .59$, $p < .001$; $r = .28$, $p < .05$; and $r = .24$, $p < .05$ respectively). Lastly, change in FQ Overinvolvement also significantly related to change in CSBQ Total, $r = .31$, $p < .01$. These positive correlations show that whereas the variables decreased from Time 1 to Time 2, the variables changed in the same direction (i.e., as FQ Criticism/Hostility decreased, so did CBCL Externalizing). This indicates that the relations found in the cross-sectional analyses and previously by Bader (2009) in the Time 1 data held true for the longitudinal data as well.

Table 13

Correlations among Change in Variables of Interest (Time 1 to Time 2)

| | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------------------|--------|--------|--------|-------|-------------------|-------|
| 1. Change in CBCL Externalizing | .41*** | .15 | .48*** | .31** | -.21 [†] | .30** |
| 2. Change in FQ Criticism/Hostility | ----- | .59*** | .28* | .26* | -.13 | .24* |
| 3. Change in FQ Overinvolvement | | ----- | .31** | .14 | -.07 | .09 |

Table 13 (continued).

| | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|-------|-------|-------|-------|
| 4. Change in CSBQ Total | | | ----- | .09 | -.05 | .05 |
| 5. Change in PSI Parental Distress | | | | ----- | -.23* | .20 |
| 6. Change in APQ Positive Parenting | | | | | ----- | -.01 |
| 7. Change in APQ Negative Parenting | | | | | | ----- |

† Trend, $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note. CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Longitudinal Analyses

To examine the temporal sequencing of the relation between parental expressed emotion and child externalizing behaviors, including whether one can predict change in the other (second hypothesis), analyses were conducted using Time 1 and Time 2 data. First, correlations between the variables of interest at Time 1 and Time 2 were conducted to ensure that these variables related to each other. In looking at the relations among Time 1 and Time 2 components of expressed emotion (FQ Criticism/Hostility and FQ Overinvolvement), symptom severity of ASD (CSBQ Total), parental distress (PSI Parental Distress), parenting practices (APQ Positive Parenting composite and APQ Negative Parenting composite), and externalizing behaviors (CBCL Externalizing composite score) zero-order correlations were performed (see Table 14). All of the variables except the Time 1 and Time 2 APQ Positive Parenting composite, and Time 2 FQ Overinvolvement significantly related to the Time 1 CBCL Externalizing composite.

Also all of the variables except Time 1 and Time 2 APQ Positive Parenting composite and Time 1 PSI Parental Distress significantly related to the Time 2 CBCL Externalizing composite. All Time 1 variables significantly related ($p < .001$) to the corresponding Time 2 variables (e.g., Time 1 CSBQ Total significantly related to Time 2 CSBQ Total). Given the longitudinal hypothesis, it is important to note that the main predictor variables of interest, Time 1 FQ Criticism/Hostility and Time 1 FQ Overinvolvement, were significantly positively correlated with the Time 2 CBCL Externalizing composite score, $r = .62, p < .001$ and $r = .33, p < .01$, respectively. Also, the Time 1 CBCL Externalizing composite score significantly related to Time 2 FQ Criticism/Hostility, $r = .48, p < .001$, but not Time 2 FQ Overinvolvement, $r = .16, p = .146$.

Table 14

Correlations among Variables of Interest, Time 1 and Time 2

| | T2 CBCL Externalizing | T2 FQ Criticism/ Hostility | T2 FQ Over- involvement | T2 CSBQ Total | T2 PSI Parental Distress | T2 APQ Positive Parenting | T2 APQ Negative Parenting |
|-------------------------------|-----------------------------|----------------------------------|-------------------------------|---------------------|--------------------------------|---------------------------------|---------------------------------|
| T1 CBCL Externalizing | .67*** | .48*** | .16 | .39*** | .19 [†] | -.10 | .24* |
| T1 FQ Criticism/ Hostility | .62*** | .66*** | .28* | .42*** | .38*** | -.17 | .43*** |
| T1 FQ Overinvolvement | .32** | .28** | .68*** | .27* | .63*** | .13 | .21 [†] |
| T1 CSBQ Total | .46*** | .38*** | .21 [†] | .72*** | .15 | .02 | .11 |
| T1 PSI Parental Distress | .15 | .21 [†] | .26* | .19 | .65*** | -.05 | .33** |
| T1 APQ Positive Parenting | -.02 | -.11 | .12 | -.11 | .04 | .71*** | -.32** |
| T1 APQ Negative Parenting | .39*** | .39*** | .01 | .28* | .21 [†] | -.34** | .73*** |

[†] Trend, $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note. T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

In order to remain consistent with the Time 1 analyses, Time 1 of the control variables were used in the longitudinal analyses. Simple correlations were also performed with Time 1 demographic variables, such as child's age, child's gender, child's race, child's cognitive level, parent's gender, parent's age, parent's marital status, and total family income to see if any significantly related to Time 2 CBCL Externalizing Behaviors, FQ Criticism/Hostility, and FQ Overinvolvement (see Table 15). Categorical variables were dichotomized (e.g., race was coded as White or Non-White) before calculating correlation coefficients. Time 1 total family income was significantly related to the Time 2 CBCL Externalizing composite, $r = -.23, p < .05$, thus it was controlled for in further analyses involving the Time 2 CBCL Externalizing composite as the criterion variable. None of the Time 1 demographic variables were significantly related to the Time 2 FQ Criticism/Hostility nor Time 2 FQ Overinvolvement. There was, however, a trend in the relation between Time 1 child's cognitive level and Time 2 FQ Overinvolvement, $r = -.19, p = .087$. Because none of the demographic variables significantly related to Time 2 FQ Criticism/Hostility nor Time 2 FQ Overinvolvement, none were controlled for in further analyses examining either of the parental expressed emotion variables as the criterion. However, based on *a priori* decisions, Time 1 autism symptom severity, parental distress, and parenting practices were used as control variables in all analyses involving Time 2 CBCL Externalizing composite, Time 2 FQ Criticism/Hostility, and Time 2 FQ Overinvolvement. Also, Time 1 of the criterion variable in each regression was controlled for in order to examine the change from one time point to another, rather than just the Time 2 level, of that criterion variable.

Table 15

Correlations among Time 1 Demographic Variables and Time 2 Outcome Variables

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------------------------------|--------|-------|-------|-------|-------|-------------------|-------|--------|-------|-------|---------|
| 1. T2 CBCL Externalizing | .71*** | .28** | -.05 | -.05 | .03 | -.03 | .09 | -.12 | .12 | -.13 | -.23* |
| 2. T2 FQ Criticism/Hostility | ----- | .36** | -.02 | .05 | .02 | .08 | .08 | -.06 | .14 | .05 | -.07 |
| 3. T2 FQ Overinvolvement | | ----- | .06 | -.02 | .11 | -.19 [†] | .00 | -.04 | -.00 | -.05 | .04 |
| 4. T1 Child's Age | | | ----- | .01 | .06 | -.18 | .08 | .42*** | .16 | .06 | -.08 |
| 5. T1 Child's Gender | | | | ----- | -.07 | -.14 | .07 | -.03 | .02 | .18 | .11 |
| 6. T1 Child's Race | | | | | ----- | -.10 | -.05 | .13 | -.25* | -.23* | -.02 |
| 7. T1 Cognitive Level | | | | | | ----- | .15 | -.08 | .17 | .28* | .08 |
| 8. T1 Parent's Gender | | | | | | | ----- | -.11 | .05 | .29** | .24* |
| 9. T1 Parent's Age | | | | | | | | ----- | .16 | .10 | .09 |
| 10. T1 Marital Status | | | | | | | | | ----- | .00 | -.43*** |
| 11. T1 Parent's Education | | | | | | | | | | ----- | .22* |
| 12. T1 Total Income | | | | | | | | | | | ----- |

[†] Trend, $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note. T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire.

A series of hierarchical multiple regression analyses were conducted as follows. First, child externalizing behaviors at Time 2 were examined as an outcome. Step 1 of this analysis included the following Time 1 variables: total family income, autism symptom severity, parental distress, positive and negative parenting practices, and externalizing behaviors. Step 2 of this analysis included parental criticism/hostility and

overinvolvement at Time 1. Thus, this analysis tested whether parental expressed emotion at Time 1 predicted *change in* child externalizing behaviors at Time 2. Results revealed that step 2 predicted significant additional variance in the Time 2 CBCL Externalizing composite, $F(8, 75) = 11.631, p < .001; R^2\Delta = .058$. Table 16 displays $R^2\Delta$ for each step and the standardized regression coefficients (β) for each variable. After controlling for the other parenting variables, parental expressed emotion still accounted for 5.8% of the variance in the change in child externalizing behaviors from Time 1 to Time 2. An examination of the beta-weights indicated that FQ Criticism/Hostility significantly predicted the CBCL Externalizing composite, $\beta = .322, p < .05$, even when controlling for all other variables (i.e., with higher levels of Time 1 FQ Criticism/Hostility relating to increases in the CBCL Externalizing composite at Time 2), whereas FQ Overinvolvement did not, $\beta = .054, p = .614$.

Table 16

Time 1 Expressed Emotion Predicting Change in Externalizing Behaviors in Children with an ASD from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R^2 | .496^{***} |
| T1 Total Income | -.049 |
| T1 CSBQ Total | .059 |
| T1 PSI Parental Distress | -.082 |
| T1 APQ Positive Parenting | .094 |

Table 16 (continued).

| | T2 CBCL Externalizing |
|--|--------------------------|
| T1 APQ Negative Parenting | .212* |
| T1 CBCL Externalizing | .578*** |
| Model 2 (Main Effects) R²Δ | .058* |
| T1 FQ Criticism/Hostility | .322* |
| T1 FQ Overinvolvement | .054 |

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

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Next, both parental criticism/hostility and overinvolvement at Time 2 were examined as outcomes in separate analyses to test whether child externalizing behaviors at Time 1 predicted *change in* parental expressed emotion at Time 2. Step 1 of each analysis included the following Time 1 variables: autism symptom severity, parental distress, positive and negative parenting practices, and criticism/hostility or overinvolvement (depending on the analysis). Step 2 of each analysis included child externalizing behaviors at Time 1. Results revealed that Time 1 Child Externalizing Behaviors did not predict additional variance in the change in Time 2 Parental Criticism/Hostility nor Time 2 Parental Overinvolvement, $F(6, 77) = 10.497, p < .001$; $R^2\Delta = .001$ and $F(6, 77) = 12.355, p < .001$; $R^2\Delta = .003$, respectively. Tables 17 and 18 display $R^2\Delta$ for each step and the standardized regression coefficients (β) for each variable for these two analyses.

Table 17

Time 1 Externalizing Behaviors in Children with an ASD Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2

| | T2 FQ Criticism/Hostility |
|---|------------------------------|
| Model 1 (Controls) R² | .449^{***} |
| T1 CSBQ Total | .054 |
| T1 PSI Parental Distress | -.074 |
| T1 APQ Positive Parenting | .074 |
| T1 APQ Negative Parenting | .119 |
| T1 FQ Criticism/Hostility | .618 ^{***} |
| Model 2 (Main Effect) R²Δ | .001 |
| T1 CBCL Externalizing | .037 |

^{***}*p* < .001

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 18

Time 1 Externalizing Behaviors in Children with an ASD Predicting Change in Parental Overinvolvement from Time 1 to Time 2

| | T2 FQ Overinvolvement |
|---|---------------------------|
| Model 1 (Controls) R² | .488^{***} |
| T1 CSBQ Total | .078 |
| T1 PSI Parental Distress | -.028 |
| T1 APQ Positive Parenting | .088 |
| T1 APQ Negative Parenting | -.111 |

Table 18 (continued).

| | T2 FQ Overinvolvement |
|---|--------------------------|
| T1 FQ Overinvolvement | .693*** |
| Model 2 (Main Effect) R²Δ | .003 |
| T1 CBCL Externalizing | -.069 |

*** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

In order to look at possible moderators in the longitudinal relation between expressed emotion and externalizing behaviors, moderated multiple regression analyses were performed examining whether the control variables (Time 1 total family income, severity of ASD symptoms, parental distress, or positive and negative parenting practices) moderated the longitudinal relations between Time 1 criticism/hostility and change in externalizing behaviors, Time 1 overinvolvement and change in externalizing behaviors, Time 1 externalizing behaviors and change in criticism/hostility, or Time 1 externalizing behaviors and change in overinvolvement. In other words, it was explored whether these control variables moderated the relation between Time 1 parental expressed emotion and the change in externalizing behaviors in children with an ASD or the relation between Time 1 externalizing behaviors and the change in parental expressed emotion. Time 1 total family income was only examined as a possible moderator in the regression analyses with externalizing behaviors as the criterion variable, as it did not significantly relate to criticism/hostility or overinvolvement. Interaction terms were computed after centering both variables in each interaction term. All interaction terms

were entered in the respective step 3 after the appropriate control variables and main effects, and the $R^2\Delta$ at step 3 was examined for significance (see Tables 19 through 32). The only significant interaction that was found was Time 1 positive parenting practices by Time 1 overinvolvement in predicting change in externalizing behaviors, $F(9,74) = 10.592, p < .001; R^2\Delta = .042, \beta = -.212$ (see Table 26). A trend was also found in the interaction between Time 1 negative parenting practices by Time 1 overinvolvement in predicting change in externalizing behaviors, $F(9,74) = 10.592, p < .001; R^2\Delta = .042, \beta = -.146$ (see Table 26) and also in the interaction between Time 1 ASD symptom severity and Time 1 externalizing behaviors in predicting change in parental criticism/hostility, $F(7,76) = 9.752, p < .001; R^2\Delta = .023, \beta = -.157$ (see Table 27).

Table 19

Interaction between Time 1 Criticism/Hostility and Time 1 Total Family Income in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R^2 | .494^{***} |
| T1 CSBQ Total | .057 |
| T1 PSI Parental Distress | -.073 |
| T1 APQ Positive Parenting | .102 |
| T1 APQ Negative Parenting | .219 [*] |
| T1 CBCL Externalizing | .586 ^{***} |
| Model 2 (Main Effects) $R^2\Delta$ | .058^{**} |
| T1 Total Income | -.074 |
| T1 FQ Criticism/Hostility | .359 ^{**} |
| Model 3 (Interaction) $R^2\Delta$ | .000 |

Table 19 (continued).

| | T2 CBCL Externalizing |
|---|--------------------------|
| T1 Total Income X T1 FQ Criticism/Hostility | -.004 |

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

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 20

Interaction between Time 1 Criticism/Hostility and Time 1 ASD Symptom Severity in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .494^{***} |
| T1 Total Income | -.048 |
| T1 PSI Parental Distress | -.082 |
| T1 APQ Positive Parenting | .092 |
| T1 APQ Negative Parenting | .215* |
| T1 CBCL Externalizing | .614 ^{***} |
| Model 2 (Main Effects) R²Δ | .058* |
| T1 CSBQ Total | .006 |
| T1 FQ Criticism/Hostility | .359 ^{**} |
| Model 3 (Interaction) R²Δ | .012 |
| T1 CSBQ Total X T1 FQ Criticism/Hostility | -.108 |

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

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 21

Interaction between Time 1 Criticism/Hostility and Time 1 Parental Distress in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .490^{***} |
| T1 Total Income | -.037 |
| T1 CSBQ Total | .060 |
| T1 APQ Positive Parenting | .104 |
| T1 APQ Negative Parenting | .194 [*] |
| T1 CBCL Externalizing | .566 ^{***} |
| Model 2 (Main Effects) R²Δ | .062^{**} |
| T1 PSI Parental Distress | -.146 |
| T1 FQ Criticism/Hostility | .359 ^{**} |
| Model 3 (Interaction) R²Δ | .000 |
| T1 PSI Parental Distress X T1 FQ Criticism/Hostility | .002 |

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

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 22

Interaction between Time 1 Criticism/Hostility and Time 1 Parenting Practices in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Controls) R² | .462^{***} |
| T1 Total Income | -.078 |
| T1 CSBQ Total | .066 |

Table 22 (continued).

| | T2 CBCL Externalizing |
|---|--------------------------|
| T1 PSI Parental Distress | -.046 |
| T1 CBCL Externalizing | .625 ^{***} |
| Model 2 (Main Effects) R²Δ | .090^{**} |
| T1 APQ Positive Parenting | .125 |
| T1 APQ Negative Parenting | .135 |
| T1 FQ Criticism/Hostility | .359 ^{**} |
| Model 3 (Interactions) R²Δ | .015 |
| T1 APQ Positive Parenting X T1 FQ Criticism/Hostility | -.050 |
| T1 APQ Negative Parenting X T1 FQ Criticism/Hostility | -.131 |

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

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, neither Time 1 positive parenting practices nor Time 1 negative parenting practices significantly moderated the relation between Time 1 parental criticism/hostility and Time 2 child externalizing behaviors in these separate analyses.

Table 23

Interaction between Time 1 Overinvolvement and Time 1 Total Family Income in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Controls) R² | .494^{***} |
| T1 CSBQ Total | .057 |
| T1 PSI Parental Distress | -.073 |
| T1 APQ Positive Parenting | .102 |
| T1 APQ Negative Parenting | .219 [*] |

Table 23 (continued).

| | T2 CBCL Externalizing |
|--|--------------------------|
| T1 CBCL Externalizing | .586 ^{***} |
| Model 2 (Main Effects) R²Δ | .027 |
| T1 Total Income | -.050 |
| T1 FQ Overinvolvement | .187 |
| Model 3 (Interaction) R²Δ | .001 |
| T1 Total Income X T1 FQ Overinvolvement | .024 |

* $p < .05$; *** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 24

Interaction between Time 1 Overinvolvement and Time 1 ASD Symptom Severity in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Controls) R² | .494^{***} |
| T1 Total Income | -.048 |
| T1 PSI Parental Distress | -.082 |
| T1 APQ Positive Parenting | .092 |
| T1 APQ Negative Parenting | .215 [*] |
| T1 CBCL Externalizing | .614 ^{***} |
| Model 2 (Main Effects) R²Δ | .027 |
| T1 CSBQ Total | .036 |
| T1 FQ Overinvolvement | .187 |
| Model 3 (Interaction) R²Δ | .000 |

Table 24 (continued).

| | T2 CBCL Externalizing |
|---------------------------------------|--------------------------|
| T1 CSBQ Total X T1 FQ Overinvolvement | .021 |

* $p < .05$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 25

Interaction between Time 1 Overinvolvement and Time 1 Parental Distress in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|--|--------------------------|
| Model 1 (Controls) R^2 | .490 *** |
| T1 Total Income | -.037 |
| T1 CSBQ Total | .060 |
| T1 APQ Positive Parenting | .104 |
| T1 APQ Negative Parenting | .194* |
| T1 CBCL Externalizing | .566*** |
| Model 2 (Main Effects) $R^2\Delta$ | .031 † |
| T1 PSI Parental Distress | -.167† |
| T1 FQ Overinvolvement | .187† |
| Model 3 (Interaction) $R^2\Delta$ | .001 |
| T1 PSI Parental Distress X T1 FQ Overinvolvement | -.032 |

† Trend, $p < .10$; * $p < .05$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 26

Interaction between Time 1 Overinvolvement and Time 1 Parenting Practices in Predicting Change in Externalizing Behaviors from Time 1 to Time 2

| | T2 CBCL Externalizing |
|---|---------------------------|
| Model 1 (Controls) R² | .462^{***} |
| T1 Total Income | -.078 |
| T1 CSBQ Total | .066 |
| T1 PSI Parental Distress | -.046 |
| T1 CBCL Externalizing | .625 ^{***} |
| Model 2 (Main Effects) R²Δ | .059[*] |
| T1 APQ Positive Parenting | .074 |
| T1 APQ Negative Parenting | .213 [*] |
| T1 FQ Overinvolvement | .187 |
| Model 3 (Interactions) R²Δ | .042[*] |
| T1 APQ Positive Parenting X T1 FQ Overinvolvement | -.212 [*] |
| T1 APQ Negative Parenting X T1 FQ Overinvolvement | -.146 [†] |

† Trend, $p < .10$; * $p < .05$; *** $p < .001$

Note. Beta-weights reported for each predictor. R² or R²Δ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, these interactions followed the same pattern; Time 1 positive parenting practices significantly moderated the relation between Time 1 parental overinvolvement and T2 child externalizing behaviors, whereas Time 1 negative parenting practices did not significantly moderate this relation.

Table 27

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Autism Symptom Severity in Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2

| | T2 FQ Criticism/Hostility |
|--|------------------------------|
| Model 1 (Controls) R² | .447^{***} |
| T1 PSI Parental Distress | -.077 |
| T1 APQ Positive Parenting | .076 |
| T1 APQ Negative Parenting | .120 |
| T1 FQ Criticism/Hostility | .647 ^{***} |
| Model 2 (Main Effects) R²Δ | .003 |
| T1 CSBQ Total | .039 |
| T1 CBCL Externalizing | .037 |
| Model 3 (Interaction) R²Δ | .023[†] |
| T1 CSBQ Total X T1 CBCL Externalizing | -.157 [†] |

[†] Trend, $p < .10$; ^{***} $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 28

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Parental Distress in Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2

| | T2 FQ Criticism/Hostility |
|---|------------------------------|
| Model 1 (Controls) R² | .445^{***} |
| T1 CSBQ Total | .058 |
| T1 APQ Positive Parenting | .079 |

Table 28 (continued).

| | T2 FQ Criticism/Hostility |
|--|------------------------------|
| T1 APQ Negative Parenting | .105 |
| T1 FQ Criticism/Hostility | .595*** |
| Model 2 (Main Effects) R²Δ | .005 |
| T1 PSI Parental Distress | -.074 |
| T1 CBCL Externalizing | .037 |
| Model 3 (Interaction) R²Δ | .000 |
| T1 PSI Parental Distress X T1 CBCL Externalizing | .001 |

*** $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 29

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Parenting Practices Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2

| | T2 FQ Criticism/Hostility |
|--|------------------------------|
| Model 1 (Controls) R² | .437*** |
| T1 CSBQ Total | .059 |
| T1 PSI Parental Distress | -.061 |
| T1 FQ Criticism/Hostility | .651*** |
| Model 2 (Main Effects) R²Δ | .013 |
| T1 APQ Positive Parenting | .071 |
| T1 APQ Negative Parenting | .116 |
| T1 CBCL Externalizing | .037 |
| Model 3 (Interactions) R²Δ | .023 |

Table 29 (continued).

| | T2 FQ Criticism/Hostility |
|---|------------------------------|
| T1 APQ Positive Parenting X T1 CBCL Externalizing | .057 |
| T1 APQ Negative Parenting X T1 CBCL Externalizing | -.133 |

*** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, neither Time 1 positive parenting practices nor Time 1 negative parenting practices significantly moderated the relation between Time 1 child externalizing behaviors and Time 2 parental criticism/hostility in these separate analyses.

Table 30

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Autism Symptom Severity in Predicting Change in Parental Overinvolvement from Time 1 to Time 2

| | T2 FQ Overinvolvement |
|--|--------------------------|
| Model 1 (Controls) R^2 | .482*** |
| T1 PSI Parental Distress | -.030 |
| T1 APQ Positive Parenting | .085 |
| T1 APQ Negative Parenting | -.094 |
| T1 FQ Overinvolvement | .711*** |
| Model 2 (Main Effects) $R^2\Delta$ | .008 |
| T1 CSBQ Total | .115 |
| T1 CBCL Externalizing | -.069 |
| Model 3 (Interaction) $R^2\Delta$ | .012 |
| T1 CSBQ Total X T1 CBCL Externalizing | -.111 |

*** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 31

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Parental Distress in Predicting Change in Parental Overinvolvement from Time 1 to Time 2

| | T2 FQ Overinvolvement |
|--|---------------------------|
| Model 1 (Controls) R² | .487^{***} |
| T1 CSBQ Total | .078 |
| T1 APQ Positive Parenting | .091 |
| T1 APQ Negative Parenting | -.117 |
| T1 FQ Overinvolvement | .681 ^{***} |
| Model 2 (Main Effects) R²Δ | .003 |
| T1 PSI Parental Distress | -.023 |
| T1 CBCL Externalizing | -.069 |
| Model 3 (Interaction) R²Δ | .000 |
| T1 PSI Parental Distress X T1 CBCL Externalizing | -.014 |

^{***} $p < .001$

Note. Beta-weights reported for each predictor. **R² or R²Δ** for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

Table 32

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Parenting Practices Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2

| | T2 FQ Overinvolvement |
|---|---------------------------|
| Model 1 (Controls) R² | .466^{***} |
| T1 CSBQ Total | .046 |

Table 32 (continued).

| | T2 FQ Overinvolvement |
|---|--------------------------|
| T1 PSI Parental Distress | -.086 |
| T1 FQ Overinvolvement | .707*** |
| Model 2 (Main Effects) R²Δ | .025 |
| T1 APQ Positive Parenting | .090 |
| T1 APQ Negative Parenting | -.098 |
| T1 CBCL Externalizing | -.069 |
| Model 3 (Interactions) R²Δ | .022 |
| T1 APQ Positive Parenting X T1 CBCL Externalizing | .115 |
| T1 APQ Negative Parenting X T1 CBCL Externalizing | -.072 |

*** $p < .001$

Note. Beta-weights reported for each predictor. R² or R²Δ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire. Separate moderated multiple regression analyses were also conducted to examine each two-way interaction separately. Again, neither Time 1 positive parenting practices nor Time 1 negative parenting practices significantly moderated the relation between Time 1 child externalizing behaviors and Time 2 parental overinvolvement in these separate analyses.

In order to further assess these significant interactions, moderated multiple regression analyses were conducted using reduced models, where the Time 1 of the criterion variable was entered on step 1 (to assess change in the criterion variable), two main effects were entered on step 2, and the interaction term was entered on step 3 (see Tables 33 through 35). None of these interactions were found to be significant in the reduced models.

Table 33

Interaction between Time 1 Overinvolvement and Time 1 Negative Parenting Practices in Predicting Change in Externalizing Behaviors from Time 1 to Time 2 (Reduced Model)

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Control) R^2 | .453^{***} |
| T1 CBCL Externalizing | .673 ^{***} |
| Model 2 (Main Effects) $R^2\Delta$ | .039[†] |
| T1 APQ Negative Parenting | .154 [†] |
| T1 FQ Overinvolvement | .127 |
| Model 3 (Interaction) $R^2\Delta$ | .002 |
| T1 APQ Negative Parenting X T1 FQ Overinvolvement | -.045 |

[†] Trend, $p < .10$; * $p < .05$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**.

T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, APQ = Alabama Parenting Questionnaire.

Table 34

Interaction between Time 1 Overinvolvement and Time 1 Positive Parenting Practices in Predicting Change in Externalizing Behaviors from Time 1 to Time 2 (Reduced Model)

| | T2 CBCL Externalizing |
|--|---------------------------|
| Model 1 (Control) R^2 | .453^{***} |
| T1 CBCL Externalizing | .673 ^{***} |
| Model 2 (Main Effects) $R^2\Delta$ | .020 |
| T1 APQ Positive Parenting | .046 |
| T1 FQ Overinvolvement | .141 |
| Model 3 (Interaction) $R^2\Delta$ | .023[†] |
| T1 APQ Positive Parenting X T1 FQ Overinvolvement | -.157 [†] |

[†] Trend, $p < .10$; *** $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**. T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, APQ = Alabama Parenting Questionnaire.

Table 35

Interaction between Time 1 Child Externalizing Behaviors and Time 1 Autism Symptom Severity in Predicting Change in Parental Criticism/Hostility from Time 1 to Time 2 (Reduced Model)

| | T2 FQ Criticism/Hostility |
|--|------------------------------|
| Model 1 (Control) R^2 | .431^{***} |
| T1 FQ Criticism/Hostility | .657 ^{***} |
| Model 2 (Main Effects) $R^2\Delta$ | .004 |
| T1 CSBQ Total | .042 |
| T1 CBCL Externalizing | .052 |
| Model 3 (Interaction) $R^2\Delta$ | .019 |
| T1 CSBQ Total X T1 CBCL Externalizing | -.138 |

^{***} $p < .001$

Note. Beta-weights reported for each predictor. R^2 or $R^2\Delta$ for models are shown in **bold**. T1 = Time 1, T2 = Time 2, CBCL = Child Behavior Checklist, FQ = Family Questionnaire, CSBQ = Children's Social Behavior Questionnaire, PSI = Parenting Stress Index, APQ = Alabama Parenting Questionnaire.

CHAPTER V

DISCUSSION

The current study, building off of previous research (i.e., Bader, 2009; Greenberg et al., 2006; Hastings et al., 2006) provided further insight into how specific parenting factors relate to externalizing behaviors in children with an ASD. Even though the sample, overall, did not exhibit a clinically significant level of externalizing behaviors, there was quite a lot of variability in the construct at both time points—and in the change in the construct over the two years of the study (Time 1 to Time 2)—with some children showing very high levels of behavioral symptoms and a large increase in externalizing behaviors over time. Based on these findings and previous research (e.g., Herring et al., 2006) indicating that externalizing behaviors in children with an ASD are very taxing on a family and often require interventions to decrease these externalizing behaviors, it was important to determine how specific parent variables related to those child behaviors both at a given time point and over time. In looking at the simple correlations among the broad variables of interest, all of the Time 2 variables of interest except Time 2 positive parenting practices were significantly related to Time 2 externalizing behaviors in children with an ASD. These findings followed the same pattern as Bader (2009). Importantly, the two constructs of parental expressed emotion, Time 2 criticism/hostility and Time 2 overinvolvement, were significantly correlated with Time 2 child externalizing behaviors. Therefore, parents higher in Time 2 expressed emotion tended to have children with higher levels of Time 2 behavioral problems. Furthermore, these two constructs of expressed emotion were significantly correlated with one another, showing that the components of expressed emotion are indeed related to one another.

In looking at the change between Time 1 and Time 2 variables, the primary variables of interest, both parental expressed emotion and child externalizing behaviors, significantly decreased from Time 1 to Time 2. Autism symptom severity and parental distress also significantly decreased at Time 2, when compared to Time 1. Even though decreases from Time 1 to Time 2 were observed, the relations among these variables remained positive. This is important because it demonstrates that, despite an overall decrease in externalizing behaviors within the sample, those children that exhibited increases in child externalizing behaviors across time had parents who demonstrated higher levels of expressed emotion.

It is also noteworthy that, when examining intercorrelations among Time 1 and Time 2 variables, child externalizing behaviors were generally significantly positively correlated with autism symptom severity, parental distress, and negative parenting practices. Consideration of these significant correlations not only provides an understanding of how parenting factors relate to externalizing behaviors in children with an ASD, but it also underscores the importance of controlling for other parenting variables when specifically examining the relation of expressed emotion with these externalizing behaviors, as was done for the current study.

Support for the Current Study Hypotheses

The findings of the current study supported the *a priori* hypotheses. In reference to the cross-sectional hypotheses, it was found that high levels of the expressed emotion component, parental criticism/hostility, not parental overinvolvement, at Time 2 uniquely related to high levels of externalizing behaviors in children with an ASD at Time 2, even after controlling for severity of ASD symptoms, parental distress, parenting practices, and

parental overinvolvement. Even though no *a priori* hypotheses were made regarding parental overinvolvement, the finding that Time 2 parental overinvolvement did not uniquely relate to high levels of externalizing behaviors in children with an ASD at Time 2, once accounting for controls, served to support the hypothesis that the relation between expressed emotion and externalizing behaviors is carried by parental criticism/hostility and also supported the findings in Bader (2009) in the Time 1 data.

The longitudinal hypothesis was also supported. It was found that parental expressed emotion, specifically Time 1 criticism/hostility, significantly predicted a change in externalizing behaviors from Time 1 to Time 2, even after controlling for Time 1 severity of ASD symptoms, parental distress, parenting practices, and total family income. Thus, children with an ASD living in family environments characterized by higher parental expressed emotion, specifically parental criticism/hostility, displayed increasingly more severe externalizing behaviors over time than children living in lower expressed emotion families. Consistent with the Greenberg and colleagues (2006) findings, this relation was not found to hold in the opposite direction; externalizing behaviors at Time 1 did not significantly predict a change in parental expressed emotion (neither criticism/hostility nor overinvolvement) at Time 2. In other words, high parental criticism/hostility at Time 1 predicted a significant change (increase) in child externalizing behaviors two years later, but high child externalizing behaviors at Time 1 did not predict a significant change in either parental criticism/hostility or parental overinvolvement two years later. Whereas only 5.8% of the variance in the change in child externalizing behaviors was accounted for by parental criticism/hostility after controlling for the other variables of interest, these findings provide further support the

unidirectional relation between parental expressed emotion and externalizing behaviors in children with an ASD found by Greenberg and colleagues and both extends it to a younger ASD sample and demonstrates that the findings hold even when controlling for other parenting variables that may impact child externalizing behaviors.

Lack of Evidence for Moderating Variables

The exploratory analyses examining possible moderating variables in the relation between parental expressed emotion and child externalizing behaviors both cross-sectionally (at Time 2) and longitudinally yielded non-significant findings on the whole. The only significant interaction that remained in a reduced model was for the Time 2 cross-sectional analyses, ASD symptom severity by parental criticism/hostility predicting child externalizing behaviors (see Figure 1). In inspecting the graph, it is clear that high parental criticism/hostility related to higher externalizing behaviors regardless of ASD symptom severity (i.e., the main effect of criticism/hostility). It also indicates that low parental criticism/hostility may serve as a protective factor, relating to lower externalizing behaviors, even among children with higher levels of ASD symptom severity. In fact, interestingly, the lowest level of externalizing behaviors was found among children with higher levels of ASD symptom severity and lower levels of parental criticism/hostility, demonstrating that low parental criticism/hostility may have particularly been a strong protective factor for those children more vulnerable for externalizing behaviors due to their higher symptom severity.

Given the overall pattern of this interaction, it may actually be most appropriately interpreted as parental criticism/hostility moderating the relation between ASD symptom severity and child externalizing behaviors, rather than ASD symptom severity moderating

the relation between parental criticism/hostility and child externalizing behaviors. Such a finding actually provides further support for the need to target parental criticism/hostility in parents in order to decrease externalizing behaviors. However, it is important to note that this was just one of six interactions examined in the cross-sectional moderated multiple regression analyses, and it could be a spurious finding.

Theoretical Implications of the Findings

The current study adds to the expressed emotion literature. It broadens support for the overall utility of expressed emotion's relation to behavior by showing that this unidirectional relation generalizes to children with an ASD. Specifically, it provides further support for Greenberg and colleagues' (2006) findings in an adolescent and adult autism population and expands these unidirectional findings to a younger child and adolescent population. The current study also provides support for the theory that expressed emotion is a trait in the parent as well as the temporal stability of the relations among these variables, given that it replicates the findings of Bader (2009) in the same sample two years later.

The findings of the current study show that higher parental expressed emotion predicts an increase in externalizing behaviors in children with an ASD two years later, which provides some initial support for the theory that change in behavior of children with an ASD may be explained by the manner in which parents respond. Parents who exhibit higher levels of criticism/hostility likely react to their children's externalizing behaviors with a more emotional valence than those with lower expressed emotion. This emotional reaction, with its reinforcing property of attention, which galvanizes the

negative cycle, could then serve to exacerbate both the frequency and intensity of the children's externalizing behaviors.

The overly strong emotional responding of a parent with high expressed emotion to a child's behavior may provide intermittent reinforcement for negative behaviors and inconsistent reinforcement for positive behaviors. This responding could serve to maintain—or even increase—the negative behaviors, while, at the same time, it would not provide enough support to increase the positive behaviors, thus contributing to the increase in the frequency and intensity of that behavior over time, causing a negative cycle. These possible explanations of the mechanism of this relation require further studies, preferably involving actual behavioral observations, to be fully supported. The current study, however, provides the theoretical basis to begin examining the exact mechanism by which the relation is expressed.

Clinical Implications of the Findings

The current study not only adds to the expressed emotion and autism literature, but also has important clinical implications. Decreasing expressed emotion in family members has been seen to be an integral component of treatments for other disorders, specifically schizophrenia (Pharoah et al., 1999; Pitschel-Walz et al., 2001), but also including depression, anxiety, bipolar, health, and behavior disorders (Butzlaff & Hooley, 1998; Hooley & Gotlib, 2000; Stubbe et al., 1993; Wearden et al., 2000). The unidirectional findings of the current study provide support for adding a component aimed at decreasing parental expressed emotion when treating children with an ASD. Further studies examining the benefits of adding this treatment component to the overall

treatment package for children with an ASD, especially those children demonstrating high levels of associated externalizing behaviors, are warranted.

It is important to look at the current treatment approaches for addressing the externalizing behaviors of children with an ASD to determine how a component targeting parental expressed emotion could supplement standard care. In a review conducted by Estrada and Pinsof (1995) describing the effectiveness of family therapies for behavioral disorders, they found that most parent training interventions were based on Patterson's (1986) treatment model for antisocial behavior. According to Estrada and Pinsof (1995), the basic theory encompassing this model is that the children's behavior problems are actually a by-product of maladaptive parent-child interactions. In this form of therapy, the therapist teaches the parents how to use specific methods that alter the parent-child interaction and, in turn, promotes both positive behaviors and decreases maladaptive ones.

Kazdin (1991) described the common characteristics of the many versions of parent training programs. These common characteristics include that the treatment is conducted mainly with the parent who then directly implements the procedures with the child at home. There may or may not be any direct intervention with the child during the therapy sessions. The parents learn to identify, define, and prioritize problem behaviors as well as learning principles and procedures such as positive and negative reinforcement and punishment, praise, ignoring, time-out, and contingency management. These learning principles and skills are taught through set programs involving a combination of parent/therapist discussion, modeling, role playing, direct practice both in session and at home, and feedback about the parents' skills. The goal is to train the parents to be able to

successfully implement these strategies consistently across settings. As the parents become more skilled with the basic principles, specific strategies are then taught to target the most severe problem behaviors and other problems experienced.

There has been found, however, to be variability in the effectiveness of these interventions with individuals. This has led researchers to explore risk and protective factors in the effectiveness of these interventions. For example Kazdin (1987, 1991) found that marital discord, parental distress, parental psychopathology, low socioeconomic status, and cognitive deficits were all risk factors to either the parents not completing the treatment or not maintaining the same level of gains over time as those without those risk factors. These findings have led researchers to explore ways to address these risk factors in order to increase the likelihood that the treatment will be successful.

As the findings of the current study, as well as those in Bader (2009) and Greenberg et al. (2006) suggest, a possible risk factor for treatments of externalizing behaviors in children with an ASD is parental expressed emotion, specifically criticism/hostility. The current findings, that this relation is unidirectional with high parental expressed emotion predicting an increase in externalizing behaviors over time, provide further support that this parental factor needs to be explored and addressed as a risk factor in treatments for externalizing behaviors in children with an ASD. In fact, adding a treatment component to decrease parental expressed emotion in other populations such as schizophrenia and bipolar has been explored (e.g., Eisner & Johnson, 2008). One possible method of decreasing expressed emotion is incorporating components of mindfulness and acceptance in the overall treatment package. Eisner and Johnson explored this in their bipolar population. Not only did they incorporate

traditional psychoeducation for parents, they also incorporated adapted materials from Christensen and Jacobson's (2000) integrative behavior couples therapy. This therapy was designed to increase emotional acceptance by decreasing negative interactions; thus, the goal is to help individuals accept, while not promoting resignation, the aspects of another individual that were previously found unacceptable. As quoted by Eisner and Jacobson, Christensen and Jacobson actually define acceptance as the ability "to tolerate what you regard as an unpleasant behavior of your [child], probably to understand the deeper meaning of that behavior, certainly to see it in a larger context, and perhaps even to appreciate its value and importance in your relationship" (p.124).

As these previous studies have formed a basis for this integration of treatment components and combined with the findings of the current study, it would follow that it may be beneficial to explore the utility of a treatment component involving mindfulness in the parent training for externalizing behaviors in children with an ASD. Mindfulness training would serve to address high parental criticism/hostility as it focuses on changing the parents' attributions and attitudes toward their children through psychoeducation and specific interventions in the parents' reactions to the children's behaviors. Components of this treatment component could include those found by Dumas (2005) in her mindfulness-based parent training for disruptive children. Dumas describes three direct ways of implementing mindfulness in parent training, which include facilitative listening, distancing, and motivated action plans. Facilitative listening is described as a form of communication that fosters an understanding and nonjudgmental acceptance of thoughts, feelings and actions both in themselves and their children (Dumas). Another goal of facilitative listening is to help parents hold a more accepting view of the challenges that

they have to face as well as a less critical view of both themselves and their children. Distancing is described as placing a psychological barrier between one's thoughts and feelings about a particular situation and the way one feels he or she must act in that situation. This helps to decrease the emotional reactions expressed by parents. An example used by Dumas is a mother saying to herself that she is mad but that she has to remain calm to not make matters worse. This allows the parents to see their negative thoughts and feelings as only part of themselves, not a total account of reality. Finally, motivated action plans refer to specific maps, scripts, or steps of actions to accomplish a desired outcome. These work best when they are specific, realistic, and the behaviors are operationally defined and observable. An example used by Dumas of a good motivated action plan is a mother saying that she will walk away from her son and sit on the couch and ignore him for three minutes the next time he yells. This motivated action plan has a greater chance of success than planning not to lose her temper the next time her son yells (Dumas). These three aspects of a mindfulness treatment component could be added into a typical parent training treatment to help address high parental expressed emotion which, in turn, should decrease a salient risk factor in the treatment addressing high externalizing behaviors in children with an ASD. With this combination of treatment components, the parents can learn how to better manage their children's behaviors (behavioral interventions) and how to view the situation and their children in a way that decreases their emotional reaction to the children's behaviors (mindfulness training). This approach allows the children's behaviors to be targeted from both aspects of the parent-child interaction and helps address potential barriers to the effectiveness of treatment.

Limitations and Directions for Future Research

Several limitations of the current study should be mentioned. First, the current study relied on single informant, parent-report data collected over a secure internet survey site. Use of a monoinformant design could result in a rater response set. However, the nature of the parent constructs lends itself to self-report and, for this population, parent ratings of child behavior are widely used. Furthermore, the results do provide preliminary evidence of a relation among the constructs of interest within a child and adolescent ASD sample. Future studies should attempt to replicate these findings with other methods.

Second, the child's diagnosis was not corroborated with assessment measures or standardized format and assessment protocol (e.g., Autism Diagnostic Interview-Revised; Autism Diagnostic Observation Schedule) beyond the CSBQ. The addition of such data would strengthen the confidence in the accuracy of the child's diagnosis. It would also allow comparisons among the different ASDs (autism, Asperger's, PDD-NOS) to be made. However, notably, the demographic and diagnostic questionnaire at both Time 1 and Time 2 provided extensive information to ascertain that a diagnosis had been made by an independent practitioner. Likewise, the current sample's mean at both Time 1 and Time 2 fell within a clinical range for ASDs on the CSBQ (from 37 to 48). It is also important to note that the parent's rating of his or her child's cognitive functioning was only based on the parent's perception and needs to be considered in that light. The fact that these diagnoses and parent's ratings of the child's cognitive functioning remained stable over the two years between the Time 1 and Time 2 data collection, provides further support for the reliability of these measures. Whereas the parents reported a high level of

comorbid diagnoses, it is important to remember that these diagnoses were not corroborated either and, thus, should be interpreted accordingly.

Third, although support groups, listservs, and websites were used to sample throughout the country (in both rural and urban settings), the majority of the sample was White, middle to upper-class, married parents who are active in autism support groups. Thus, the findings may not generalize to the overall population of children with an ASD. Interestingly, the fact that total family income still related, in some of the analyses, to externalizing behaviors in this relatively homogeneous, middle to upper middle class sample, indicates how strong of a predictor family income may be in a more heterogeneous sample. This is certainly worth further exploring. It is also noteworthy that the sample consisted of 87% male children. Although ASDs are male-dominated disorders, the ratio of males to females in the current sample (6:1) was still somewhat higher than the base rates among the ASD population (approximately four males to every one female). Because of the limited number of females in the current sample, it is unclear how well these findings apply to girls with an ASD.

Finally, the conclusions that can be drawn are further limited by the quasi-experimental design of the current study. Whereas the current study examined the direction of the relation and whether it was uni- or bidirectional, the only assertion that can be made is that the findings *imply* a causal relation in that high parental criticism/hostility predicts increasing levels of externalizing behaviors in children with an ASD over time. The longitudinal design is more robust and provides a great deal more support for this possible causal relation than a cross-sectional design as was conducted by Bader (2009). Furthermore, the longitudinal design addressed an issue raised by Bader in

that a cross-sectional relation does not determine which variable precedes the other (i.e., the temporal sequencing). Bader theorized that parental expressed emotion, specifically criticism/hostility, further exacerbates externalizing behaviors among children with an ASD. However, it is also possible that higher externalizing behaviors in children lead to higher parental expressed emotion, specifically criticism/hostility. The findings of the current study, as well as those found by Greenberg and colleagues (2006) in an adolescent and adult ASD sample, support the former conclusion of a uni-directional relation, with high parental criticism/hostility predicting a significant increase in externalizing behaviors in children with an ASD.

Given the cross-sectional interaction of parental criticism/hostility and ASD symptom severity in predicting child externalizing behaviors, further studies examining the difference between low and high functioning children with an ASD are warranted. Future studies could include corroborating the child's diagnoses of an ASD as well as any other comorbid diagnoses and then exploring the differences among these groups. Also, studies using structural equation modeling (SEM) may be beneficial.

Future treatment outcome studies should be conducted looking at the utility of adding a treatment component addressing parental expressed emotion to the overall treatment package for externalizing behaviors in children with an ASD. It may also be worth examining whether assessing parental expressed emotion at the beginning of a treatment affects the outcome of the treatment (i.e., treatments for children with an ASD in a high expressed emotion household may be less effective than for those in a low expressed emotion household). Studies could also examine expressed emotion among the staff of inpatient, outpatient, and residential facilities to see if this robust relation holds in

those settings as well; again, there would be important treatment implications if a significant relation were found.

Conclusion

In conclusion, the current study adds to both the autism and expressed emotion literature, as it is the first known study looking at both the cross-sectional and longitudinal relation between parental expressed emotion and externalizing behaviors in a homogeneous sample of children, ages 8 to 18, with an ASD, controlling for a variety of other parenting variables in an effort to examine the unique relation of parental expressed emotion. The current study provides a basis to now further explore this relation, possibly examining other moderators or mediators, the exact mechanism of change, and benefits of focusing on reducing parental expressed emotion for children with an ASD. It may also be beneficial for further studies to explore the relation between parental expressed emotion and other child variables such as internalizing symptoms and social skills. Such research can foster a deeper understanding of assessment, diagnostic, and treatment issues for children with an ASD in an effort to minimize the impairments associated with this set of disorders. Ultimately, since a unidirectional relation between parental expressed emotion and externalizing behaviors in children with an ASD has been established, lowering parental expressed emotion could become an important point of intervention as a component of a larger treatment package aimed at decreasing externalizing behaviors in children with an ASD.

APPENDIX A

FAMILY QUESTIONNAIRE (FQ)

This questionnaire lists different ways in which families try to cope with everyday problems. For each item please indicate how often you have reacted to the patient in this way. There are no right or wrong responses. It is best to note the first response that comes to mind. Please respond to each question, and mark only one response per question. PLEASE ANSWER ALL ITEMS.

| | Never/ Very Rarely | Rarely | Often | Very Often |
|--|-----------------------------------|-----------------------|-----------------------|-----------------------|
| 1. I tend to neglect myself because of him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. I have to keep asking him/her to do things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I often think about what is to become of him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. He/she irritates me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. I keep thinking about the reasons for his/her illness | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I have to try not to criticize him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I can't sleep because of him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. It's hard for us to agree on things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. When something about him/her bothers me, I keep it to myself | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. He/she does not appreciate what I do for him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. I regard my own needs as less important | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. He/she sometimes gets on my nerves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I'm very worried about him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. He/she does some things out of spite | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I thought I would become ill myself | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. When he/she constantly wants something from me, it annoys me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. He/she is an important part of my life | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. I have to insist that he/she behaves differently | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19. I have given up important things in order to be able to help him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. I'm often angry with him/her | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

APPENDIX B

CHILDREN'S SOCIAL BEHAVIOR QUESTIONNAIRE (CSBQ)

The following are a number of statements about children's behaviors. Please rate each item as to how child in the preceding two months. The possible answers are Does Not Apply (0), Sometimes or Somewhat Applies (1), and Clearly or Often Applies (2). PLEASE ANSWER ALL ITEMS.

| | Does Not Apply | Sometimes or Somewhat Applies | Clearly or Often Applies |
|--|-------------------------------|--|---|
| 1. Talks confusedly; jumps from one subject to another in speaking | 0 | 1 | 2 |
| 2. Only talks about things that are of concern for himself/herself | 0 | 1 | 2 |
| 3. Does not fully understand what is being said to him/her i.e., tends to miss the point | 0 | 1 | 2 |
| 4. Frequently says things that are not relevant to the conversation | 0 | 1 | 2 |
| 5. Does not understand jokes | 0 | 1 | 2 |
| 6. Takes things literally e.g., does not understand certain expressions | 0 | 1 | 2 |
| 7. Is exceptionally naive; believes anything you say | 0 | 1 | 2 |
| 8. Over-reacts to everything and everyone | 0 | 1 | 2 |
| 9. Draws excessive attention to him/herself | 0 | 1 | 2 |
| 10. Flaps arms/hands when excited | 0 | 1 | 2 |
| 11. Makes odd, fast movements with fingers or hands | 0 | 1 | 2 |
| 12. Sways to and fro | 0 | 1 | 2 |
| 13. Does not look up when spoken to | 0 | 1 | 2 |
| 14. Acts as if others are not there | 0 | 1 | 2 |
| 15. Lives in a world of his/her own | 0 | 1 | 2 |
| 16. Makes little eye contact | 0 | 1 | 2 |
| 17. Dislikes physical contact | 0 | 1 | 2 |
| 18. Does not seek comfort | 0 | 1 | 2 |
| 19. Does not initiate play with other children | 0 | 1 | 2 |
| 20. Has little or no need for contact with others | 0 | 1 | 2 |
| 21. Does not respond to initiatives by others e.g., does not play along when asked | 0 | 1 | 2 |
| 22. Is unusually sensitive to certain sounds (e.g., always hears certain sounds earlier than other people) | 0 | 1 | 2 |
| 23. Is extremely pleased by certain movements and keeps doing them e.g., turning around and around | 0 | 1 | 2 |
| 24. Smells objects | 0 | 1 | 2 |

| | Does Not Apply | Sometimes or Somewhat Applies | Clearly or Often Applies |
|--|-------------------------------|--|---|
| 25. Constantly feels objects | 0 | 1 | 2 |
| 26. Is fascinated by certain colors, forms, or moving objects | 0 | 1 | 2 |
| 27. Has difficulties doing two things simultaneously e.g., he/she cannot dress and listen to parent at the same time | 0 | 1 | 2 |
| 28. Does things without realizing what stage of the activity he/she has reached (beginning, middle, ending) | 0 | 1 | 2 |
| 29. Does things without realizing the aim e.g., constantly has to be reminded to finish things | 0 | 1 | 2 |
| 30. Shows sudden changes of mood | 0 | 1 | 2 |
| 31. Quickly gets angry | 0 | 1 | 2 |
| 32. Stays angry for a long time e.g., when he/she does not get his/her way | 0 | 1 | 2 |
| 33. Cannot be made enthusiastic about anything; does not particularly like anything | 0 | 1 | 2 |
| 34. Does not show his/her feelings in facial expressions and/or bodily posture | 0 | 1 | 2 |
| 35. Does not appreciate danger | 0 | 1 | 2 |
| 36. Barely distinguishes between strangers and familiar people e.g., readily goes with strangers | 0 | 1 | 2 |
| 37. Is disobedient | 0 | 1 | 2 |
| 38. Cannot be corrected in situations in which he/she has done something wrong | 0 | 1 | 2 |
| 39. Takes in information with difficulty | 0 | 1 | 2 |
| 40. Makes inconsiderate remarks e.g., remarks that are painful to others | 0 | 1 | 2 |
| 41. Does not appreciate it when someone else is hurt or sad | 0 | 1 | 2 |
| 42. Makes a fuss over little things; "makes a mountain out of a mole-hill" | 0 | 1 | 2 |
| 43. Does not know when to stop, e.g., goes on and on about things | 0 | 1 | 2 |
| 44. Is extremely stubborn | 0 | 1 | 2 |
| 45. Panics in new situations or if change occurs | 0 | 1 | 2 |
| 46. Remains clammed up in new situations or if change occurs | 0 | 1 | 2 |
| 47. Opposes change | 0 | 1 | 2 |
| 48. Gets lost easily e.g., when out with someone | 0 | 1 | 2 |
| 49. Has no sense of time | 0 | 1 | 2 |

APPENDIX C

ALABAMA PARENTING QUESTIONNAIRE (APQ)

The following are a number of statements about your family. Please rate each item as to how often it TYPICALLY occurs in your home. The possible answers are Never (1), Almost Never (2), Sometimes (3), Often (4), Always (5). PLEASE ANSWER ALL ITEMS.

| | Never | Almost Never | Some- times | Often | Always |
|--|-------|-----------------|----------------|-------|--------|
| 1. You have a friendly talk with your child | 1 | 2 | 3 | 4 | 5 |
| 2. You let your child know when he/she is doing a good job with something | 1 | 2 | 3 | 4 | 5 |
| 3. You threaten to punish your child and then do not actually punish him/her | 1 | 2 | 3 | 4 | 5 |
| 4. You volunteer to help with special activities that your child is involved in (such as sports, boy/girl scouts, church youth groups) | 1 | 2 | 3 | 4 | 5 |
| 5. You reward or give something extra to your child for obeying you or behaving well | 1 | 2 | 3 | 4 | 5 |
| 6. Your child fails to leave a note or to let you know where he/she is going | 1 | 2 | 3 | 4 | 5 |
| 7. You play games or do other fun things with your child | 1 | 2 | 3 | 4 | 5 |
| 8. Your child talks you out of being punished after he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 9. You ask your child about his/her day in school | 1 | 2 | 3 | 4 | 5 |
| 10. Your child stays out in the evening past the time he/she is supposed to be home | 1 | 2 | 3 | 4 | 5 |
| 11. You help your child with his/her homework | 1 | 2 | 3 | 4 | 5 |
| 12. You feel that getting your child to obey you is more trouble than it's worth | 1 | 2 | 3 | 4 | 5 |
| 13. You compliment your child when he/she does something well | 1 | 2 | 3 | 4 | 5 |
| 14. You ask your child what his/her plans are for the coming day | 1 | 2 | 3 | 4 | 5 |
| 15. You drive your child to a special activity | 1 | 2 | 3 | 4 | 5 |
| 16. You praise your child if he/she behaves well | 1 | 2 | 3 | 4 | 5 |
| 17. Your child is out with friends you don't know | 1 | 2 | 3 | 4 | 5 |
| 18. You hug or kiss your child when he/she has done something well | 1 | 2 | 3 | 4 | 5 |
| 19. Your child goes out without a set time to be home | 1 | 2 | 3 | 4 | 5 |
| 20. You talk to your child about his/her friends | 1 | 2 | 3 | 4 | 5 |
| 21. Your child is out after dark without an adult with him/her | 1 | 2 | 3 | 4 | 5 |

| | Never | Almost Never | Some- times | Often | Always |
|---|-------|-----------------|----------------|-------|--------|
| 22. You let your child out of a punishment early (like lift restrictions earlier than you originally said). | 1 | 2 | 3 | 4 | 5 |
| 23. Your child helps plan family activities | 1 | 2 | 3 | 4 | 5 |
| 24. You get so busy that you forget where your child is and what he/she is doing | 1 | 2 | 3 | 4 | 5 |
| 25. Your child is not punished when he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 26. You attend PTA meetings, parent/teacher conferences, or other meetings at your child's school | 1 | 2 | 3 | 4 | 5 |
| 27. You tell your child that you like it when he/she helps out around the house | 1 | 2 | 3 | 4 | 5 |
| 28. You don't check that your child comes home at the time she/he was supposed to | 1 | 2 | 3 | 4 | 5 |
| 29. You don't tell your child where you are going | 1 | 2 | 3 | 4 | 5 |
| 30. Your child comes home from school more than an hour past the time you expect him/her | 1 | 2 | 3 | 4 | 5 |
| 31. The punishment you give your child depends on your mood | 1 | 2 | 3 | 4 | 5 |
| 32. Your child is at home without adult supervision | 1 | 2 | 3 | 4 | 5 |
| 33. You spank your child with your hand when he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 34. You ignore your child when he/she misbehaving | 1 | 2 | 3 | 4 | 5 |
| 35. You slap your child when he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 36. You take away privileges or money from your child as a punishment | 1 | 2 | 3 | 4 | 5 |
| 37. You send your child to his/her room as a punishment | 1 | 2 | 3 | 4 | 5 |
| 38. You hit your child with a belt, switch, or other object when he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 39. You yell or scream at your child when he/she has done something wrong | 1 | 2 | 3 | 4 | 5 |
| 40. You calmly explain to your child why his/her behavior was wrong when he/she misbehaves | 1 | 2 | 3 | 4 | 5 |
| 41. You use time out (make him/her sit or stand in a corner) as a punishment | 1 | 2 | 3 | 4 | 5 |
| 42. You give your child extra chores as a punishment | 1 | 2 | 3 | 4 | 5 |

APPENDIX D

DEMOGRAPHIC AND DIAGNOSTIC INFORMATION QUESTIONNAIRE

Please fill out the following information **about your child**.

Child's Age: _____ **Child's Date of Birth:** (Month/Day/Year) ____/____/____

Child's Gender: Female ___ Male ___ **Child's First and Last Initials:** _____

Child's Race: White ___ Black ___ Hispanic ___ Asian ___ Other _____

Your child's birth order rank: First (Oldest)____ Second____ Third____ Fourth____
Other (Please Specify)_____

What diagnosis was given to your child? Asperger's____ Autism____
PDD-NOS____ Other (Please specify)_____

What age was your child when you first noticed symptoms? _____

How old was your child when he/she was diagnosed? _____

Who diagnosed your child? Psychologist ___ Pediatrician____ Neurologist____
Psychiatrist____ Other (Please specify)_____

Has your child received any other diagnoses? (Please select all diagnoses received)
___ADHD ___Anxiety Disorder ___Conduct Disorder ___Depression ___Learning Disability
___Mental Retardation ___Oppositional Defiant Disorder ___Other (Please specify)_____

Please rate your child's overall cognitive functioning level:
___Well Below Average ___Below Average ___Average ___Above Average ___Well Above Average

What is your child's current school placement? (Please specify at least the type of classroom, type of school and if your child has an individual aide.) _____

What services has your child received? (Please check all that apply)
___Applied Behavioral Analysis (ABA) ___Early Intervention Services ___Physical Therapy
___Occupational Therapy ___Psychological Treatment ___Speech Therapy
___Other (Please Specify)_____

Is your child currently on any medications? (If so, please list each medication and dosage received)

Have there been any significant changes in your child's life, major life events, in the past two years?
(Examples include a birth/death in the family, moving, parental loss of job, parental separation, medical illness in the family, etc.) Please list any/all major life events that have occurred in the past two years.

On a scale of 1 to 5 please rate how much your child appeared to be affected by these major life events, with 1 being not at all or very little and 5 being significantly affected. _____

Please fill out the following information **about you and your family.**

Your Gender: Female ___ Male ___ **Your Age:** _____ years

Location: (City, State) _____, _____

Your Race: White ___ Black ___ Hispanic ___ Asian ___ Other _____

Marital Status: Married ___ Separated ___ Divorced ___ Widowed ___
 Never Married/Living Alone ___ Never Married/Living with Someone ___

Education: What is the highest level of education completed by:

| Yourself | Your Spouse/Significant Other (Only if he/she lives in the household) |
|--|--|
| _____ 6 th grade or less | _____ 6 th grade or less |
| _____ Junior high school (7 th , 8 th , 9 th grade) | _____ Junior high school (7 th , 8 th , 9 th grade) |
| _____ Some high school (10 th , 11 th grade) | _____ Some high school (10 th , 11 th grade) |
| _____ High school graduate | _____ High school graduate |
| _____ Some college (at least 1 year) or specialized training | _____ Some college (at least 1 year) or specialized training |
| _____ College/university graduate (4-year degree) | _____ College/university graduate (4-year degree) |
| _____ Graduate professional degree (Master's, Doctorate) | _____ Graduate professional degree (Master's, Doctorate) |

Occupation: Please provide your job title or position, NOT the just name of your employer. For example, if you are a teacher at Lee High School, please state "high school teacher". If you are **retired**, please state your prior occupation. If you **do not work** outside the home, state "unemployed."

What is your occupation? (Please be specific) _____

What is your spouse's occupation? (Please be specific) _____

Income: What is the total annual income of your household? (Combine the income of **all** people living in your house.)

_____ \$ 0 -- \$ 4,999 _____ \$15,000 -- \$24,999 _____ \$50,000 -- \$74,999
 _____ \$ 5,000 -- \$ 9,999 _____ \$25,000 -- \$34,999 _____ \$75,000 -- \$99,999
 _____ \$10,000 -- \$14,999 _____ \$35,000 -- \$49,999 _____ \$100,000 and above

Please list who lives in the household:

Age Gender Relation to Child** Any Diagnoses (If so, please specify)

| Age | Gender | Relation to Child** | Any Diagnoses (If so, please specify) |
|-----|--------|---------------------|---------------------------------------|
| | | | |
| | | | |
| | | | |
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| | | | |

** Please be specific in describing the relation to child; self, brother, mother, father, step-father, step-brother, half-brother, adopted sister, grandmother, aunt, cousin, etc.

APPENDIX E

INSTITUTIONAL REVIEW BOARD APPROVAL FORM



 THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
 Hattiesburg, MS 39406-0001
 Tel: 601.266.6820
 Fax: 601.266.5509
 www.usm.edu/irb

**HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
 NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **R27111205**

PROJECT TITLE: **Family and Sibling Characteristics in the Household of a Child With an Autism Spectrum Disorder**

PROPOSED PROJECT DATES: **09/01/09 to 01/01/11**

PROJECT TYPE: **Previously Approved Project**

PRINCIPAL INVESTIGATORS: **Stephanie Bader**

COLLEGE/DIVISION: **College of Education & Psychology**

DEPARTMENT: **Psychology**

FUNDING AGENCY: **N/A**

HSPRC COMMITTEE ACTION: **Expedited Review Approval**

PERIOD OF APPROVAL: **11/12/09 to 11/11/10**

Lawrence A. Hosman
 Lawrence A. Hosman, Ph.D.
 HSPRC Chair

11-18-09
 Date

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