

Mindfulness: A Factor in Consideration of Parent Stress and Theory of Mind Among  
Children With and Without Autism Spectrum Disorder

By

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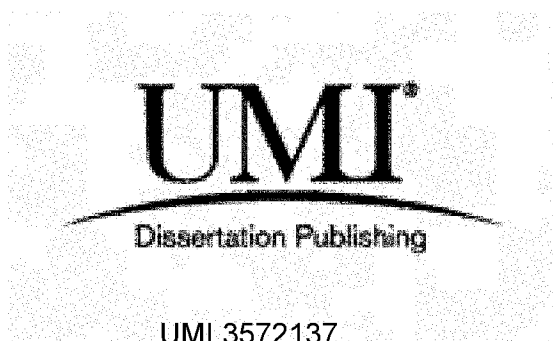
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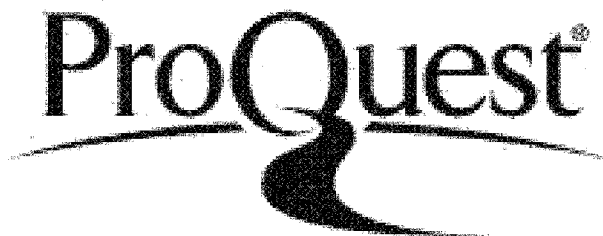


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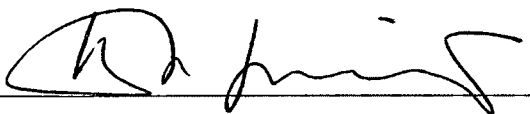
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## ABSTRACT

Parents of children with special needs, including those with problems of relating and communicating such as in autism spectrum disorder, are at risk for significantly higher levels of stress than parents of neurotypical children. This study investigated the relationship between a particular way of attending to experience, known as mindfulness, and dimensions of parent stress and children's theory of mind. Parents completed self-report measures of parenting stress and mindfulness, and a widely accepted screening tool for autism spectrum disorder (ASD) regarding their child. Children completed a performance-based battery of theory of mind tasks. Using published, psychometrically-defined cut scores, group differences analyses were conducted, with particular attention given to likelihood (*p* value) and magnitude (Cohen's *d*) of differences between parents endorsing or not endorsing clinically elevated levels of stress, and having children rated as having or not having a high probability of ASD diagnosis, among different facets of mindfulness. Additionally, single-predictor linear regression models were examined to explore relationships between parenting stress, degree of the child's impairment in functioning, and the parent's level of mindfulness. Within regression models, analysis of individual participant influence yielded information on the coherence of each model, providing idiographic information as to what demographic effects may affect covariation between constructs. Certain factors related to mindful living correspond with greater stress tolerance or resilience in parents of children with autism, including having a non-reactive and non-judgmental response style. Further, theory of mind development in children was positively related to all mindfulness factors. These data suggest that a larger



investigation of mindfulness and their relation to parenting stress is indicated. If a more robust investigation yields results consistent with this pilot study, and mindfulness practices or behaviors are demonstrated to be beneficial for parents with children on the autism spectrum, then a suitable evidence base exists for development of a supportive parenting intervention for parents of ASD children.

*Keywords:* mindfulness, autism, stress, intervention, parenting

## CHAPTER I

### INTRODUCTION

Stress affects all systems of the human body in pernicious and long-lasting ways. This is not a new medical insight, but rather an age-old understanding that has been written about, lamented, and sought to be “cured” through all manner of interventions. Plants exhibit phototropic behavior to move from a situation of stress, that of excess light exposure, to a situation of ease (Whippo & Hangarter, 2006). Animals have adapted means for coping with the vicissitudes of nature, that supreme source of stress, in the evolutionarily helpful mechanisms such as hibernation, seasonal mating, and territorial battles. But stress can also lead to the shutting down of that which makes an organism truly alive: the dog who, by the mechanism of “learned helplessness,” succumbs to the stressful shocks in its cage and simply sits in the corner, howling; the soldier who cannot do more than to drink away the flashbacks and anxieties associated with post-traumatic stress disorder (Seligman & Maier, 1967; Bremner, Southwick, Darnell, & Charney, 1996). Stress *kills*.

Many traditions of cultural, religious, and spiritual thought have struggled to understand stress, its causes, and its remediation. One of the oldest living and thriving traditions to work towards a less-stressed existence for humans is Buddhism, the spiritual tradition that dates back to the life and teachings of an Indian prince, Siddhartha Gotama, born in the 5th century BCE. Founded on the belief that all life is suffering, Buddhist thinkers have developed a highly systematized constellation of practices, precepts, and beliefs that aim to relieve people from the unavoidable suffering of living (Epstein,

2007). For many, the Buddhist system remains as applicable and effective in the 21st century as it was 2,500 years ago.

When considering chronically stressed groups of people, one need not look further than parents. As such, clinicians and researchers are beginning to apply mindfulness-based techniques to parents (Sawyer Cohen & Semple, 2010). Parents report more significant and chronic stress than non-parents, and parents of children with special needs, such as children with autism spectrum disorder (ASD) or learning disability (LD), consistently evidence higher stress levels among parents (Schieve, 2007; Johnson, Frenn, Feetham, & Simpson, 2011). Given the many constraints and difficulties of being a parent, including scheduling activities for children, maintaining a career, and making adequate time for self-care, parents of special needs children are important candidates for stress-management and reduction strategies.

The past thirty years have seen a growing trend within psychology to apply Buddhist thinking to clinical practice (Segal, Williams, & Teasdale, 2001; Baer, 2006; Germer, Siegel, & Fulton, 2005; Kabat-Zinn, 2005; Lee, Semple, Rosa, & Miller, 2008; Linehan et al., 1999). The mindfulness-based interventions literature continues to grow and develop, and has been applied to numerous clinical populations, including people suffering from depression (Teasdale et al., 2000), borderline personality disorder (Linehan et al., 1999), attention (Napoli, Krech, & Holley, 2005), and anxiety (Semple, Reid, & Miller, 2005). However, the literature and evidence base for data on and interventions for mindfulness and parents, especially of ASD children, is sparse. This

study aims to lessen this deficit, in the hopes of supporting the development of supportive mindfulness-based interventions for parents.

This paper presents data from a correlation and group comparison design investigating the mindfulness and stress characteristics of parents of ASD children, and the theory of mind abilities of their children. By investigating the predictive and moderating power of mindfulness on parenting stress and theory of mind, future studies will be able to build on the data towards an experimental, empirically-valid intervention for parents of ASD children. Such an intervention would support less parenting stress and more harmonious families which, ultimately, will benefit all members of the family.

## CHAPTER II

### LITERATURE REVIEW

#### **Mindfulness**

Mindfulness refers to a core component of Buddhist spiritual practice that focuses on how and to what a person attends in their experience. To better understand the concept of mindfulness, however, requires contextualization regarding the origination of Buddhism and the first teacher within the spiritual system, the Buddha. Exact records of the person of the Buddha and the early teachings of Buddhism are not available; however, oral traditions, recorded in writing centuries after the Buddha's death, present a comprehensive account of the early states and teachings of Buddhism.

Siddhattha Gotama, a prince of the Sakya clan in present day Nepal, was born in approximately the 6<sup>th</sup> century BCE. He spent the first thirty-six years of his life in the comforts of nobility, but became dissatisfied with answers to major philosophical questions about life, suffering, and redemption. Texts indicate that at age 36, he became “enlightened” while meditating under a tree in India, after which he was free of suffering and endowed with clarity on the truth of existence. From this experience, Gotama described the Four Noble Truths of existence: 1) All life is stress/suffering<sup>1</sup>; 2) Stress/suffering comes from craving; 3) Stress/suffering can be overcome; 4) The “Noble Eightfold Path” is the way of practice to overcoming stress/suffering (Bullitt, 2012a; Bullitt, 2012b).

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<sup>1</sup> In the original written teachings in Buddhism, the original word in the native language, Pali, used to describe the object of the Four Noble Truths is *dukkha*. Various translators of Buddhist writings into English have rendered the word as either “stress” or “suffering.”

Within the “Noble Eightfold Path,” the Buddha included “Right Mindfulness” as one of the eight key components. As described by one of the foremost spiritual scholars and practitioners, mindfulness is “a faculty of active memory, adept at calling to mind and keeping in mind instructions and intentions that will be useful” on the path to freedom from stress/suffering (Thanissaro, 2012, p. 7). This capacity works to maintain an ardent awareness of the arising and passing away of mental phenomena, including feelings, sense impressions, and memories, without dwelling on them or attaching labels such as “I like this” or “This is horrible” to the experience. A foundational Buddhist text on mindfulness, the Satipatthana Sutta, describes in great detail the nature of mindfulness and how to cultivate this capacity; further discussion of the intricacies of mindfulness from the Buddhist perspective is beyond the scope of this work (*Majjhima Nikaya* 10). However, it is important to note that the technique known as meditation, described as a mindful observing of the arising and passing away of sense experiences, for instance the breath, is key to the development of the mindfulness faculty and eventual release from stress/suffering.

From a Buddhist perspective, what might be considered psychopathology develops as an externalization of a mind clouded by hindrances that interrupt attention to the present moment. Therapeutically, one sees children and parents who cannot sustain attention to their internal affective state and/or environmental affects for many reasons, including many analytically derived defenses. A mindfulness-based therapeutic strategy enables children and parents to attend to their affects, strengths, and weaknesses in such a manner that they neither attach to the feelings nor spurn them in pursuit of an oasis of

comfort, of non-suffering (Baer, 2006; Bögels, Hoogstad, van Dun, de Schutter, & Restifo, 2008).

Jon Kabat-Zinn, one of the first clinicians to integrate mindfulness in patient care, started the Stress Reduction Program at the University of Massachusetts Medical Center in 1979, which centered on the application of “mindfulness” practices and yoga in the alleviation of clinically significant stress in patients. Dr. Kabat-Zinn sought to employ the Buddhist concept of mindfulness, which he describes as “The awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience,” to stress reduction but without its Buddhist roots (Kabat-Zinn, 2003, p. 145). His program has been empirically validated for its effectiveness, and continues to grow and develop.

Although mindfulness in the context of Buddhist spiritual practice has been interpreted for over 2,500 years, no clear operational definition existed in the Western psychological literature until recently. Scott Bishop and a number of authors within the mindfulness literature proposed the following two-part definition of mindfulness for the purpose of furthering research, exploration, and implementation of mindfulness practices:

“The first component involves the self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment. The second component involves adopting a particular orientation toward one’s experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance.” (Bishop et al., 2004, p. 232)

From this definition stems specific diagnostic questions that lead to both an understanding of a patient's psychopathology (or lack thereof), as well as distinct paths for therapeutic work should impairment exist. Further, mindfulness scales were developed, validated, and published for use in clinical and research settings, including the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ is a 33 item self-report measure that was developed from a factor analysis of multiple mindfulness questionnaires, and represents the gold standard research tool for measuring mindfulness in adults. It is interesting to note that although mindfulness-based practices developed from the Buddhist spiritual tradition, neither the operational definition above nor the recently developed mindfulness scales explicitly reflect spiritual or religious affiliations, opening the fruits of mindfulness practice to patients without necessitating the acceptance of the comprehensive system of Buddhist beliefs.

Various clinical scientists have used “mindfulness” interchangeably or within the definition of other concepts, most notably mentalization (Karlsson & Kermott, 2006; Bouchard et al., 2008). Mentalization (Fonagy, Gergely, Jurist, & Target, 2002) refers to the capacity to consider one's own and another person's mental state. Reflective function is the authors' “operationalization of the mental capacities that generate mentalization (ibid., p. 3; Karlsson & Kermott, 2006). Taken together, mentalization and reflective functioning combine the moment-to-moment awareness of one's own mental state with the capacity to imagine what another person is thinking and feeling. The “curiosity, openness, and acceptance” from Bishop and colleagues' definition is not a component of



mentalization or the underlying reflective function (Bishop et al., 2004). Further, as mindfulness is centered only upon how one relates to one's own moment-to-moment mental activity, mentalization and reflective functioning expand and extend beyond the core spiritually derived construct of mindfulness. Conceptually, accurate and consistent attention to one's own mental state, as characterized by mindfulness and one component of mentalization, would appear to underlie the interpersonal aspects of mentalization. Increased evidence of mentalization in parents has correlated with greater rate of secure attachment; the relationship between mindfulness and attachment remains unexplored (Fonagy, Steele, Steele, Moran, & Higgitt, 1991).

Mindfulness-based clinical practices emphasize a present-centered awareness of experiences according to their true nature, that is to say free of attachment, preconception, judgment, or false belief. At its core, mindfulness practice within a psychological, meditative, or spiritual sense involves the ability to select and sustain attention to oneself and one's environment (Shapiro & Carlson, 2009; Bishop et al., 2004; Carmody, 2009).

Mindfulness therapy systems address a core deficit in a person's ability to be aware of and relate to both internal and external affects and behaviors. Mindfulness-based therapy speaks to the patient's present circumstance in order to develop more skillful means to interact with internal and external affects (Germer, Siegel, & Fulton, 2005). Mindfulness-based techniques and practices are particularly suited for parents. Mindfulness, as a construct, supports active and compassionate self-care as well as relationships with other people. In specifically targeting reactive, judgmental, and non-

accepting thoughts, mindfulness speaks to the core areas of conflict between parents and their children, with or without ASD. Previous work speaks to the effectiveness of mindfulness-based interventions for adults and parents of neurotypical children, but little work has investigated the relationship between mindfulness and reductions in parenting stress. Further, the literature supports the importance of acceptance, compassion, and openness as significant parenting traits associated with secure attachment and the development of pro-social behaviors and capacities in children, including theory of mind (Baron-Cohen, 1989). Children with ASD exhibit theory of mind deficits, and so the development of this capacity may be supported by the same parenting behaviors that mindfulness-based parenting entails. Thus having parents who engage their relationships mindfully, allowing for a “meeting of minds,” may predict greater theory of mind and reduced development of psychopathology in the child (Sharp & Fonagy, 2008, p. 750).

Further, the Buddhist concept of impermanence is introduced and reinforced to counter parent and child fears and apprehensions of change. Such concepts are introduced both through direct experience via meditative exercises as well as a logical system of false-belief disputation and Socratic teaching. Consistent with the cognitive therapeutic tradition, mindfulness-oriented therapy sees such skill development in attentive, non-judgmental awareness as necessary not just for psychopathological intervention but also life-long growth and development (Shapiro & Carlson, 2009).

The cognitive-behavioral literature contains a number of novel and effective mindfulness-based treatments for adults and children, including Dialectical Behavior Therapy (Linehan et al., 1999) and Mindfulness Based Cognitive Therapy for Children

(Woodberry, Roy, & Indik, 2008; Lee, Semple, Rosa, & Miller, 2008). However, the idea of a short-term rigidly-defined system for teaching mindfulness techniques in a therapeutic context is intrinsically problematic, as mindfulness as a capacity develops over a long period of time and requires commitment and perseverance for longer than eight to twelve weeks. Further, the development of affective attention characterized by mindfulness does not follow a common trajectory between persons. Thus mindfulness-based therapy cannot simply be a short-term cognitive exercise, but requires significant development and reflection to maximize the long-lasting therapeutic gains necessary to move children and adults onto a normative level of affective functioning.

### **Parenting & Stress in Families with ASD Children**

Hans Selye, a Viennese physician and scientist, was one of the first Western clinicians to develop a general theory of stress, appreciate the multifactorial nature of what causes stress, and describe its relationship to discomfort and disease (Selye, 1956). Selye studied how stress affects the physiology and neuroendocrinology of the human body, and results from a breakdown of the body's ability to maintain homeostasis during times of difficulty. His findings have been confirmed repeatedly, and as is pertinent to this investigation, provide necessary context for understanding the difficulties and stress for parents of children with autism.

Persons experiencing significant stress, whether due to a trauma (Ehlers & Clark, 2000), chronic stressors (Sandi, 2004), or working under pressure (Young, Goodie, Hall, & Wu, 2012) exhibit sub-optimal decision making and cognitive performance. In fact,

chronic stress changes neural structure and functioning (Sandi, 2004). When strategies are taught and implemented, such persons regain some if not all of their baseline ability. Parents of children with autism spectrum disorder report higher levels of stress as compared to parents of neurotypical children (Baker-Ericzen et al., 2005) or other developmental disabilities (Hastings et al., 2005). The ASD child's social communication impairments alone create numerous difficulties for clear communication and problem solving in the home. Children's behavior problems, which manifest in a multitude of ways but generally include behaviors that are repetitive, rigid, or restricted to certain objects, make the goal of homeostasis within the home and family dynamics that much more difficult (Hastings, 2003). This lack of homeostasis is but one component underlying the stress in the parents (e.g., Boyd, 2002).

In addition, parents of ASD children often experience a number of stress-inducing reactions to having a child with a developmental disorder. A sense of guilt, shame, and embarrassment on having a child who is not perfect, not like their same-aged peers, is often endorsed by parents of ASD children. The anxiety inherent in trying to maintain employment, a hobby, or a romantic relationship is significant and often crippling for the parent (Whelan & Hudson, 1987).

Based on the literature regarding the pernicious effects of stress on functioning (e.g., Sandi, 2004), as well as regarding the powerful effects of mindfulness practices to decrease stress and encourage resilience (e.g., Williams, Ciarrochi, Patrick Deane, 2010; Bernstein, Tanay, & Vujanovic, 2011), one would expect that parents of children with

ASD would benefit significantly from great mindfulness, as would be seen in lower ratings of stress and cognitive & emotional burn-out.

### **ASD & Intergenerational Transmission Of Stress**

Frances Tustin provided a model for autism that drew heavily on clinical work with child patients and psychoanalytic formulations of the etiology of autism. She described a hypothesis for the etiology of autism as a two-part reaction: the child first has an abnormally close relationship with the mother, and then that abnormal relationship is severed. The resulting stress from that traumatic severance promotes the self-protective shutting out of others (the “social communication deficit” in modern parlance) and the development of an “auto-sensuous insulation” (Tustin, 1994, p. 14).

While recent models of the etiology of autism involve a dense interplay between genetics and environment, Tustin’s model continues to resonate with some clinicians. This concept that ASD arises from broken relationships and stress reactions is understandable. Further, the stress on parents of ASD children may be circular. Sossin & Birklein (2006) observed the non-verbal transmission of stress in parent-child dyads along two dimensions: in dyads where the parent endorsed high stress, the dyad showed more dis-harmony of non-verbal states, and the reacting to the other through development of polar opposite non-verbal states. While this work studied dyads with neurotypical children, it stands to reason that the findings would be more pronounced where the child component of the dyad would be less attuned, and the parent more stressed. Thus a less mindful parent would exhibit more stress, which then would cascade and appear in the

child through less developed stress resilience and functional ability, such as theory of mind capacity. Inversely, a more mindful parent would report less stress, and thus a more communicative or interactive child.

### **Theory Of Mind Development, Particularly In ASD**

One of the core deficits in Autism Spectrum Disorder presentations lies within the realm of “theory of mind” (Humphrey, 1976; Premack & Woodruff, 1978). The development of this capacity, which conceptualizes a person’s ability to consider the thoughts, feelings, and intentions of other people, is not clearly understood (Oberman & Ramachandran, 2007). However, both of the two competing theories for the development of theory of mind, theory–theory (Gopnik & Meltzoff, 1997) and simulation theory (Goldman, 2000), involve the intersubjective Other, generally a parent figure, to provide the stimuli, reciprocity, and mirroring necessary for growth. At present, multiple lines of intervention aim to develop the theory of mind of people with ASD (e.g., Cohen, 2011), mindfulness concepts may play a key part in such development but at this time no published work examines this relationship.

As previously described, the high levels of stress evident in parents of children with ASD may impede a parent’s ability to be present, attentive, attuned, and responsive. Efforts to reduce stress, develop self- and other-awareness, and promote rich interactions between parents and ASD children are thus indicated for the development of theory of mind. Stanley Greenspan and Serena Wieder, who developed the DIR Model for assessment of and intervention with children with ASD, recognized that following the

play of a child and co-creating meaning out of activities as essential to the development of theory of mind (Wieder & Greenspan, 2003). The Floortime method of intervention, based upon the DIR model, is in some ways founded upon a practitioner's mindful approach to their experience and the experience of a child with ASD: alert, ardent observation, without judgment, with the goal of reducing stress, finding meaning, and understanding the relationship between cause and effect. It would not be surprising if a more mindful approach to experience on the part of a parent would raise the emotional, communicative, and theory of mind capacities of their children with ASD, given that mindfulness-oriented Floortime exhibits just such an effect (e.g., Hess, 2013; Pajareya & Nopmaneejumrulers, 2012).

### **Summary and Statement of Purpose**

This project investigates the predictive and moderating power of mindfulness practices and behaviors on parent stress and the theory of mind of children with ASD. Understanding how the powerful approach to experience known as mindfulness affects a person's ability to cope with stress has rewards on the individual, family, and community levels. Further, too little research on how parents of children with ASD, both their experience and how to support them, is currently present in the literature (Sawyer Cohen & Semple, 2010). If the hypotheses are supported, the findings will contribute not only to a better understanding of the protective factors of mindful parenting but also to future studies, including the development of an experimental, empirically valid intervention for

parents. Such an intervention would support less parenting stress and more harmonious families that, ultimately, will benefit all members of the family.

To determine whether mindful ways of approaching one's experience predict lower parenting stress in parents and more developed theory of mind in children, this investigator conducted regression analyses to determine the relationship between parental mindfulness and parent stress, as well as parental mindfulness and children's theory of mind development. In addition to covariation between overall mindfulness and parenting stress, empirically defined component analyses of each construct were pursued with the five facets from the FFMQ. Lastly, a moderating analysis yielded information on the moderating effect of parent stress on the mindfulness-theory of mind relationship, as parent mindfulness may support a child's theory of mind development through a causal route that includes lowered parenting stress.

### **Hypotheses**

Hypothesis 1: Parents with ASD will endorse significantly greater levels of total parental stress than parents of neurotypical children.

Hypotheses 2: Parents of ASD will endorse significantly decreased levels of mindfulness as compared to parents of neurotypical children.

Hypothesis 3: Parental mindfulness and total parenting stress will be significantly inverse-correlated for all parent populations.

Hypothesis 4: Parental mindfulness will be significantly (positively) correlated with child's theory of mind for all parent/child populations.



Hypothesis 5: Parenting stress moderates the relationship between parental mindfulness and child's theory of mind development.

## **CHAPTER III**

### **METHOD**

#### **Overview**

This study examines how parental mindfulness relates to parent self-reported stress and children's theory of mind development. Data from this project will add to the growing body of research related to mindfulness and mindfulness-related psychotherapeutic interventions, while providing novel data on how parent mindfulness relates to theory of mind development in children on the autism spectrum. This chapter describes the participants involved in the study, the measures used, as well as the research procedure.

#### **Participants**

The initial design sought to recruit 40 parent-child dyads with children between the age of 8 and 12 years old from specialized education centers in the greater New York City metropolitan area, namely the Rebecca School and the Aaron Academy. Recruiting flyers and phone calls were made through school psychologists, to minimal results. The study team widened the age range (4 through 12 years of age) and recruitment area (schools and parent support groups in the New York/New Jersey area) to increase responses. These sites included AHRC's Brooklyn Blue Feather School, Aaron School, Alpine Learning Group, The Queens Special Education Parent Center (QSEPC), The Asperger Syndrome and High Functioning Autism Association (AHA), and the Nassau Suffolk Chapter of the Autism Society of America (NSASA). Of the hundreds of recruitment packets and communications disseminated, thirty-five (35) parents agreed to participate. Twenty-one (21) parent-child dyads participated in the research project, a 60.0% response rate. Seventeen (81%) of the parents that participated were mothers and four

(19%) were fathers. All 21 parents indicated that English was their primary language. This was considered an adequate sample given the very specific population of interest, the sensitivity, depth, and comprehensive nature of data collection. See Table 1 for parent demographics information and Table 2 for child demographics information.

Table 1  
*Parent Participant Demographics*

Demographic	<i>n</i>	Percentage of Sample
Overall participation rate (N =21)	21	60.0%
Parent Gender		
Male	4	19.0%
Female	17	81.0%
Marital Status		
Parents together in home	19	90.5%
Parents separated/divorced	1	4.8%
Other	1	4.8%
Ethnicity		
Caucasian	15	71.4%
African American	3	14.3%
Hispanic/Latino	1	4.8%
Pacific Islander	1	4.8%
Other	1	4.8%
Primary language		
English	21	100.0%
Highest Level of Education		
High School Diploma	2	9.5%
Some College	1	4.8%
BS/BA	4	19.0%
Some Graduate School	1	4.8%
MS/MA	11	52.4%
Other	2	9.5%
Parent Employment Status		
Employed Full-time	11	52.4%
Employed Part-time	7	33.3%
Unemployed	3	14.3%
Parents' Annual Household Income		
Less than 15,000	1	4.8%
15,000 to 29,999	1	4.8%
50,000 to 74,999	5	23.8%
75,000 to 99,999	2	9.5%
100,000 to 199,999	6	28.6%
200,000 or more	4	19.0%
Prefer not to answer	2	9.5%

Table 2

*Child Participant Demographics*

Demographic	<i>n</i>	Percentage of Sample
Gender		
Male	17	81.0%
Female	4	19.0%
Age		
4–6	6	28.6%
7–9	9	42.9%
10–12	6	28.6%
Number of siblings		
0	9	42.9%
1	6	28.6%
2	2	9.5%
3	3	14.3%
4+	1	4.8%
Primary Diagnosis		
Autistic Disorder	9	42.9%
PDD-NOS	9	42.9%
Asperger's Disorder	3	14.3%

Demographic	<i>n</i>	Percentage of Sample
Comorbid Psychiatric Diagnosis (N =19)		
ADHD	3	14.3%
Anxiety Disorder	1	4.8%
Obsessive Compulsive Disorder	1	4.8%
Sensory Integration Disorder	10	47.6%
Attachment Disorder	1	4.8%
Regulatory Disorder	1	4.8%
Other	2	9.5%
Comorbid Learning Disability (N = 9)		
Learning Disorder NOS	3	14.3%
Auditory Processing Disorder	3	14.3%
Other	3	14.3%
Medical Conditions (N = 19)		
Head Injury	1	8.3%
Seizures/Epilepsy	4	19.0%
Ear Infections	7	33.3%
Vision Problems	2	9.5%
High Fevers	2	9.5%
Other	3	14.3%

## Materials

### *Five Facet Mindfulness Questionnaire*

The Five Facet Mindfulness Questionnaire is a 33 item self-report measure that reflects the user's degree of mindfulness on multiple dimensions (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Participants rate each statement on a 5-point scale as to how much the statement best describes them. This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Studies of the FFMQ have revealed construct validity in meditating and non-meditating samples of adults (Baer et al., 2008), as well as strong correlations to other mindfulness measures not involved in the factor analysis ( $r \geq .07$ ).

### *Parenting Stress Index*

The PSI is a 101-item parent self-report measure of parenting stress (PSI; Abidin, 1983). Parents use a 5-point scale to indicate the degree to which they agree with each statement. Widely used in the literature, it yields robust, reliable indices of parenting stress as an overall total as well as within the following composites: Depression, Isolation, Attachment, Health, Role Restriction, Competence, & Spouse.

### *Social Communication Questionnaire*

The Social Communication Questionnaire (SCQ) is a 40-item parent report measure developed to assess the core behavioral domains of pervasive developmental disorders

(Berument, Rutter, Lord, Pickles, & Bailey, 1999; Rutter, Bailey, & Lord, 2003). Each item is answered yes or no to indicate whether a child shows a particular behavior. Items are summed to produce a total score, ranging from 0 to 39 for verbal children and from 0 to 33 for non-verbal children, which is then compared to the cutoff scores of 15. Items selected for the SCQ were those with the best discriminative power on the ADI-R (Lord, 1997). A recent validation study confirmed appropriate psychometric qualities for the SCQ, with a sensitivity 0.88, and a specificity 0.72 (Chandler, Charman, Baird, Simonoff, Loucas, Meldrum, Scott, & Pickles, 2007). Table 3 provides a 2x2 matrix of whether a clinical referral is indicated from PSI data by the child's ASD status from a SCQ data.

Table 3

*Clinical Classification x PSI Status*

	PSI Warrants Clinical Referral <sup>b</sup>	
	Not Indicated	Indicated
SCQ Classification <sup>a</sup>		
Non-Clinical	4 <sup>c</sup>	6
Clinical	3 <sup>d</sup>	8

*Note.* SCQ = Social Communication Questionnaire; PSI = Parenting Stress Index.

<sup>a</sup>SCQ Classification based on Lifetime score  $\geq 15$ . <sup>b</sup>PSI Clinical Referral Indication based on Total Stress score  $\geq 260$ . <sup>c</sup>Participant 1024 triggered the Defensive Response Style validity indicator of the PSI and was removed from analyses involving the PSI. <sup>d</sup>Participant 1015 triggered the Defensive Response Style validity indicator of the PSI and was removed from analyses involving the PSI.

*Theory of Mind*

Following Joseph & Tager-Flusberg (2004), three standard theory of mind measures were modified for this study to make stimuli age-appropriate regarding subject matter and current language. For each task, participants were told a simple story and asked questions about their understanding of the story. Correct responses allowed for progress to more complex tasks, with cut scores determining success on each task. A perception knowledge task (Pillow, 1989; Pratt and Bryant, 1990) tested the ability to infer knowledge from perceptual access. On two trials, children were shown that an object was concealed in a small box. Next, they observed one female doll who looked in the box and another male doll who simply touched the box, and they were asked a knowledge question "Does he/she know what's in the box?" If successful, children would next complete a location-change false belief task, assessing understanding of false beliefs within a story (Wimmer and Perner, 1983). For each story, participants were asked a knowledge question (Does X know where Y is?), a false belief question (Where will X look first for Y?), and a false belief justification question (Why?). The final task, an unexpected-contents false belief task, was essentially a more complex version of the location change false belief task, and was included to preclude ceiling effects (Perner, Leekam, and Wimmer, 1987; Gopnik and Astington, 1988). Participants were shown two different familiar containers that held unexpected contents. Each of two trials included a self false belief question (When you first saw this box, what did you think was inside?), a knowledge question (If I show this box to X, will X know what is inside?), and an other person's false belief question (What will X think is inside?).



**Procedure**

In March 2011, this researcher and two Pace University colleagues received Institutional Review Board (IRB) approval from Pace University for this study. Letters of interest were distributed to interested parents by the school psychology staff at collaborating institutions, as well as through direct-mail responses from interested families. Interested parents were contacted to explain the study. Parents were scheduled for a 1.5 hour interview, during which they signed consent forms and completed a packet of questionnaires. Included in the packet were a demographics form (inquiring about age, gender, socio-economic status, meditation history, child's developmental and psychological history), mindfulness questionnaire, and parenting stress questionnaire. Parents who wished to complete their questionnaires on-line were provided with access to electronic copies through Qualtrics, a secure, on-line, cloud-based survey and data storage platform. Afterward, parents completed a semi-structured interview as part of a co-occurring study. For the children's theory of mind data, school psychologists scheduled eligible students for 30 minute interviews with a researcher during the school day; for participants not able to schedule such an at-school interview, home visits were scheduled. Researchers solicited the assent of the participant, and then conducted a brief theory of mind battery.

## CHAPTER IV

### RESULTS

#### Data Analysis

Due to sampling difficulties stemming from families' hesitance to agree to intensive multi-hour assessment sessions without remuneration, twenty-one (21) of the expected forty (40) parent-child dyads participated in the study. The small sample size necessitated that data analysis proceed along two tracks. Group difference analyses, the first track of analysis, were conducted with *t*-tests between groups defined by SCQ clinical cutoff scores ( $SCQ \geq 15$ ; Rutter, Bailey, & Lord, 2003), PSI referral cutoff scores (PSI Total Stress  $\geq 260$ ; Abidin, 1983). The *t*-tests alone generally yield likelihood estimates that would be suspect with this study's small sample size. To aid in analysis of group differences, effect size comparisons were completed using magnitude estimates from Cohen's *d*.

The second track of analysis involved measures of individual participants (or dyads) influence on single predictor linear regressions. Participant-level effects were analyzed through examination of Cook's Distance (Cook's *D*) and Standardized DFBETA values from regression analyses. Cook's *D* measures the "distance" between the residuals and leverage of a regression equation with and without a specific case, regardless of the scale of the independent variables. Similarly, Standardized DFBETA indicates the standardized change in the standardized regression coefficient with and without a specific case in the regression equation. Indications of participant-level effects were if Cook's *D* values were greater than  $4/n$ , or if the absolute value of Standardized DFBETA values were greater than  $2/\sqrt{n}$  (Fox, 1991). For each regression in the following chapter, results are displayed

in both table and scatterplot form. While traditionally these presentations would be redundant, the scatterplot yields a much more clear indication of the influence of a particular case relative to both sample-size-adjusted cut points, as defined in the psychometric literature, and other participants within the data set.

*Hypothesis 1. Parents with ASD children will endorse significantly greater levels of total parental stress than parents of neurotypical children.*

All parents involved with this study had children identified as having an autism spectrum diagnosis. However, to investigate this hypothesis, children's SCQ scores were used to identify children with deficits in social communication indicative of an ASD presentation ( $n = 10$ ) and those without such a deficit ( $n = 9$ ). Group difference analysis reveals a significant difference at the .05 level between stress levels of parents with more impaired children than less impaired children,  $t(17) = -3.70, p = 0.002, d = -1.80, 95\% \text{ CI } [-73.57, -20.12]$ . Comparisons between clinically impaired children (as determined by a high SCQ score) and their less-impaired peers within parents who have exceptionally high stress levels indicates a large effect size within the difference on the mindfulness factor Non-reactivity to Inner Experience,  $t(11) = -1.34, p = 0.21, d = 0.93$ . See Table 1 for similar data.

Table 4

*Group Comparisons by SCQ Indication, PSI Indication, and Mindfulness Factor*

FFMQ Dimension	PSI Warrants Clinical Referral?	SCQ Clinical Classification				<i>t</i>	<i>p</i>	95% CI		Cohen's <i>d</i>
		Non-Clinical		Clinical				<i>LL</i>	<i>UL</i>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Observing										
	Not Indicated	25.33 <sup>a</sup>	3.06	29.50 <sup>b</sup>	2.12	2.10 <sup>e</sup>	0.10	-1.53	11.03	-1.94
	Indicated	26.00 <sup>c</sup>	7.92	22.37 <sup>d</sup>	5.15	-1.11 <sup>f</sup>	0.29	-12.59	4.14	0.61
Describing										
	Not Indicated	36.00 <sup>a</sup>	3.46	30.50 <sup>b</sup>	6.36	-1.41 <sup>e</sup>	0.23	-14.88	4.88	1.53
	Indicated	30.33 <sup>c</sup>	4.97	31.63 <sup>d</sup>	3.81	0.82 <sup>f</sup>	0.43	-3.45	7.50	-0.32
Acting With Awareness										
	Not Indicated	30.00 <sup>a</sup>	6.00	29.50 <sup>b</sup>	3.54	-0.25 <sup>e</sup>	0.82	-12.25	10.25	0.12
	Indicated	29.33 <sup>c</sup>	5.50	27.13 <sup>d</sup>	7.22	-0.43 <sup>f</sup>	0.67	-10.20	6.85	0.36
Non-judging of Inner Experience										
	Not Indicated	30.00 <sup>a</sup>	2.00	32.00 <sup>b</sup>	0.00	1.04 <sup>e</sup>	0.36	-2.49	5.49	-1.58
	Indicated	30.67 <sup>c</sup>	7.37	31.00 <sup>d</sup>	4.38	0.17 <sup>f</sup>	0.87	-7.00	8.20	-0.06
Non-reactivity to Inner Experience										
	Not Indicated	24.00 <sup>a</sup>	1.00	25.00 <sup>b</sup>	2.83	0.53 <sup>e</sup>	0.63	-3.19	4.69	-0.71
	Indicated	23.50 <sup>c</sup>	3.78	20.13 <sup>d</sup>	3.98	-1.34 <sup>f</sup>	0.21	-8.15	2.00	0.93

*Note.* FFMQ = Five-Factor Mindfulness Questionnaire; SCQ = Social Communication Questionnaire; PSI = Parenting Stress Index.

<sup>a</sup>*n* = 3. <sup>b</sup>*n* = 2. <sup>c</sup>*n* = 6. <sup>d</sup>*n* = 8. <sup>e</sup>*df* = 3. <sup>f</sup>*df* = 12.

To investigate participant level effects, linear regression of parents' total stress on SCQ was conducted. Social communication impairment statistically predicted a parent's total stress,  $r^2 = 0.23$ ,  $b = 2.31$ ,  $t = 2.26$ ,  $p = .037$ , 95% CI for  $b$  [0.15, 4.47]. Case-wise deletion results indicate that two participants exert large influence over this model: Participant 1021, Cook's D = 0.24, Standardized DFBETA -0.63; Participant 1035, Cook's D = 0.31, Standardized DFBETA -0.70. See Table 5 for full influence analysis. In addition, Figure 1 presents the per-participant standardized DFBETA data from Table 5 as a scatterplot, so as to better capture the presence and degree of participant level effects.

Table 5

*Influence Analysis for Linear Regression of Parent's Total Stress (PSI) on  
Child's Social Communication Impairment (SCQ)*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.02	-0.02	2.30
1002	0.13	0.42	0.43	2.74
1003	0.07	0.14	0.14	2.45
1004	0.04	-0.07	-0.07	2.24
1007	0.02	-0.10	-0.10	2.21
1008	0.00	0.05	0.05	2.36
1009	0.02	0.17	0.18	2.49
1012	0.00	0.02	0.02	2.33
1013	0.00	0.02	0.02	2.33
1015				
1017	0.02	0.00	0.00	2.32
1020	0.01	0.13	0.14	2.45
1021	0.24*	-0.63**	-0.64	1.67
1022	0.01	0.03	0.04	2.35
1023	0.00	-0.04	-0.04	2.27
1024				
1029	0.10	0.34	0.34	2.65
1030	0.11	-0.06	-0.06	2.25
1031	0.00	0.00	0.00	2.31
1032	0.07	0.11	0.11	2.42
1035	0.31*	-0.70**	-0.67	1.64

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; PSI = Parenting Stress Index; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff (4/*n*) = .21 <sup>b</sup>Cutoff (2/ $\sqrt{n}$ ) = .46

Figure 1. Influence Analysis for Linear Regression of Parent's Total Stress on Child's Social Communication Impairment

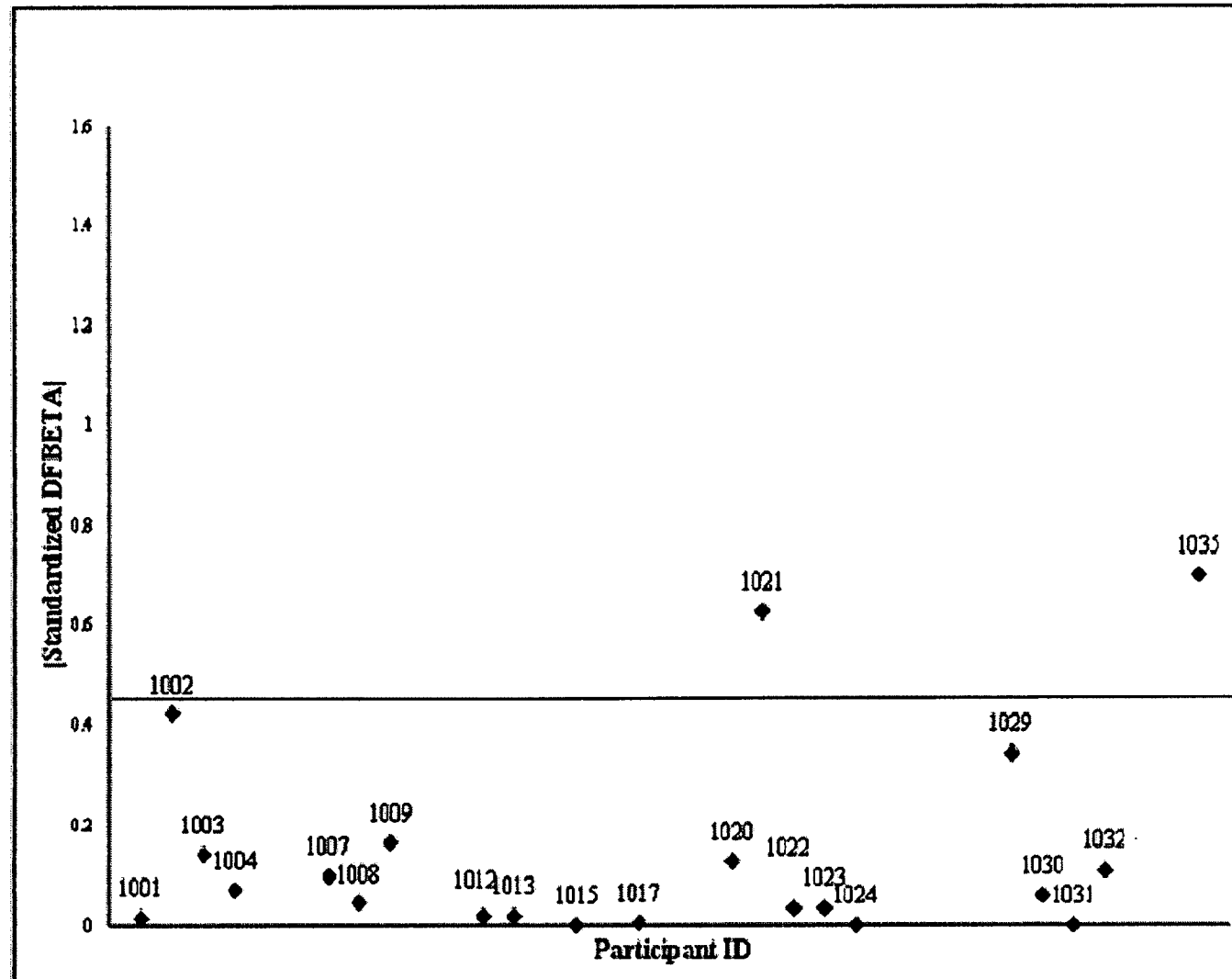


Figure 1. Case-wise measures of influence in linear regression of parents' Total Stress (PSI) on child's Social Communication Deficit (SCQ). Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; SCQ = Social Communication Questionnaire.

*Hypotheses 2. Parents of ASD children will endorse significantly decreased levels of mindfulness as compared to parents of neurotypical children.*

As described in Table 6, group differences analyses revealed no significant differences at the .05 level between parents with clinically impaired and non-impaired children on mindfulness characteristics. However, following Cohen's (1988) guidelines for interpretation of effect sizes, the medium effect size ( $d = 0.60$ ) of the difference between parents of clinically impaired and non-impaired children on Non-reactivity to Inner Experiences suggests that this factor may be particularly compromised in parents of more symptomatic children,  $t(19) = -1.37, p = 0.19$ , Cohen's  $d = 0.63$ , 95% CI [-5.38, 1.13]. Table 7 presents data on the five models associated with predicting social communication deficits by individual mindfulness factors.



Table 6  
*Mean Difference Analyses Between ASD Indications on Mindfulness Factors*

FFMQ Dimension	SCQ Clinical Classification						95% CI		Cohen's <i>d</i>
	Non-Clinical (n=10)		Clinical (n=11)		<i>t</i> (19)	<i>p</i>			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Observing	25.50	6.15	24.09	5.30	-0.56	0.58	-6.64	3.82	0.26
Describing	31.90	4.95	31.27	3.82	-0.33	0.75	-4.65	3.39	0.15
Acting With Awareness	29.30	5.06	28.45	6.83	-0.32	0.75	-6.38	4.69	0.15
Non-judging of Inner Experience	30.00	5.75	30.82	3.89	0.38	0.70	-3.63	5.27	-0.18
Non-reactivity to Inner Experience	23.40	2.99	21.27	4.00	-1.37	0.19	-5.38	1.13	0.63

*Note.* ASD = Autism Spectrum Disorder; SCQ = Social Communication Questionnaire; FFMQ = Five-Factor Mindfulness Questionnaire; CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 7  
*Overview of Models Predicting SCQ from Mindfulness Factors*

Mindfulness Factor	$r^2$	<i>b</i>	<i>SE<sub>b</sub></i>	<i>B</i>	<i>t</i>	<i>p</i>	95% CI for <i>b</i>	
							<i>LL</i>	<i>UL</i>
Observing	0.00	-0.06	0.29	-0.05	-0.20	0.85	-0.67	0.55
Describing	0.08	-0.46	0.37	-0.28	-1.25	0.23	-1.22	0.31
Acting With Awareness	0.00	0.00	0.28	0.00	0.01	1.00	-0.58	0.58
Non-judging of Inner Experience	0.00	-0.08	0.34	-0.05	-0.22	0.83	-0.79	0.64
Non-reactivity to Inner Experience	0.01	-0.15	0.45	-0.08	-0.34	0.74	-1.09	0.79

*Note.* SCQ = Social Communication Questionnaire; FFMQ = Five Factor Mindfulness Questionnaire; CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 8 and Figure 2 present data on participant level effects for the linear regression of the child's degree of social communication impairment (SCQ) on the mindfulness factor Observing from the FFMQ. As detailed in Table 6, no statistically significant difference exists between the Observing capacity of parents of non-clinical children as compared to parents of clinical children,  $t(19) = -0.56$ ,  $p = 0.58$ , Cohen's  $d = 0.26$ , 95% CI [-6.64, 3.82]. The Observing factor accounts of a negligible amount of the variance in the child's social communication impairment,  $r^2 = 0.00$ ,  $b = -0.06$ , 95% CI for  $b$  [-0.67, 0.55]. No participant-level effects were observed in the analysis by either metric of influence.

Table 8

*Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Mindful Observing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.01	0.11	0.03	-0.03
1002	0.06	-0.08	-0.02	-0.02
1003	0.00	-0.05	-0.01	-0.01
1004	0.00	0.01	0.00	0.00
1007	0.09	-0.37	-0.11	-0.11
1008	0.02	0.06	0.02	0.02
1009	0.10	0.19	0.05	0.16
1012	0.00	0.01	0.00	-0.08
1013	0.01	0.05	0.01	-0.03
1015	0.00	0.02	0.01	0.01
1017	0.00	0.01	0.00	-0.37
1020	0.07	-0.12	-0.03	0.03
1021	0.14	-0.19	-0.05	0.14
1022	0.00	-0.05	-0.02	0.00
1023	0.06	0.30	0.09	0.13
1024	0.00	0.03	0.01	0.03
1029	0.04	0.13	0.04	0.05
1030	0.00	0.01	0.00	-0.12
1031	0.05	-0.26	-0.08	-0.26
1032	0.01	-0.13	-0.04	-0.09
1035	0.09	0.23	0.06	0.36

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff = .19 <sup>b</sup>Cutoff = .44

Figure 2. Influence Analysis of Regression of Child's Social Communication Impairment on Parent's Mindful Observing

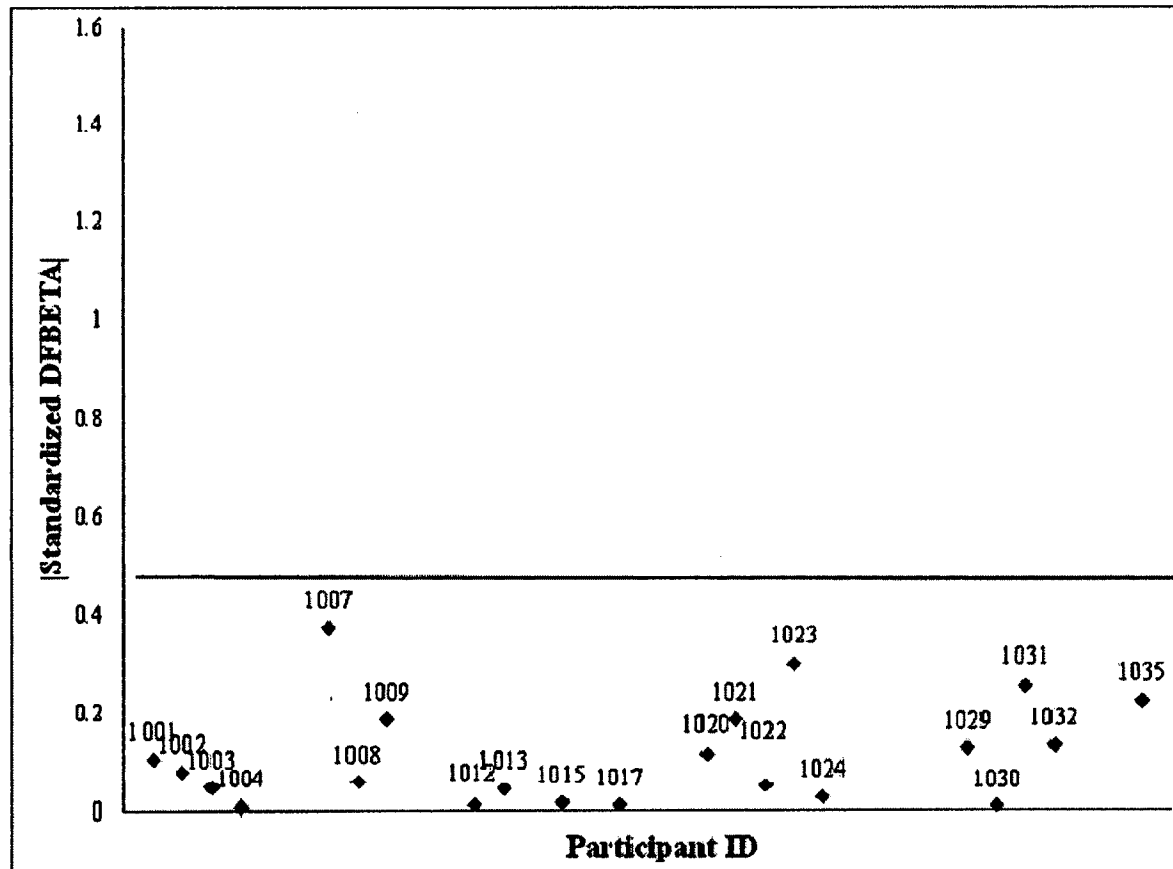


Figure 2. Case-wise measures of influence in linear regression of children's social communication deficit (SCQ) on parent's FFMQ facet of Observing. Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. SCQ = Social Communication Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire.

Table 9 and Figure 3 present data on participant level effects for the linear regression of the child's degree of social communication impairment (SCQ) on the mindfulness factor Describing from the FFMQ. As detailed in Table 6, no statistically significant difference exists between the Describing capacity of parents of non-clinical children as compared to parents of clinical children,  $t(19) = -0.33$ ,  $p = 0.75$ , Cohen's  $d = 0.15$ , 95% CI [-4.65, 3.39]. The Describing factor accounts of approximately 8% of the variance in the child's social communication impairment,  $r^2 = 0.08$ ,  $b = -0.46$ , 95% CI for  $b$  [-1.22, 0.31]. Three participant dyads showed evidence of having notable influence of the regression: participant dyad 1002, Cook's  $D = 0.20$ , Standardized DFBETA = -0.57,  $b$  with case removed = -0.67; participant dyad 1012, Cook's  $D = 0.31$ , Standardized DFBETA = 0.73,  $b$  with case removed = -0.19; participant dyad 1020, Cook's  $D = 0.46$ , Standardized DFBETA = 0.91,  $b$  with case removed = -0.16,

Table 9

*Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Mindful Describing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.01	0.06	0.02	-0.44
1002	0.20*	-0.57**	-0.21	-0.67
1003	0.00	-0.03	-0.01	-0.47
1004	0.00	0.01	0.00	-0.45
1007	0.01	-0.01	-0.01	-0.46
1008	0.02	-0.09	-0.03	-0.49
1009	0.13	-0.35	-0.12	-0.58
1012	0.31*	0.73**	0.26	-0.19
1013	0.00	-0.03	-0.01	-0.47
1015	0.00	-0.01	0.00	-0.46
1017	0.00	0.02	0.01	-0.45
1020	0.46*	0.91**	0.29	-0.16
1021	0.15	-0.22	-0.07	-0.53
1022	0.00	-0.01	0.00	-0.46
1023	0.04	0.18	0.07	-0.39
1024	0.01	0.08	0.03	-0.43
1029	0.03	-0.13	-0.05	-0.50
1030	0.00	0.01	0.00	-0.46
1031	0.02	0.07	0.02	-0.43
1032	0.00	-0.02	-0.01	-0.47
1035	0.13	-0.42	-0.15	-0.61

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff = .19 <sup>b</sup>Cutoff = .44

Figure 3. Influence Analysis of Regression of Child's Social Communication Impairment on Parent's Mindful Describing

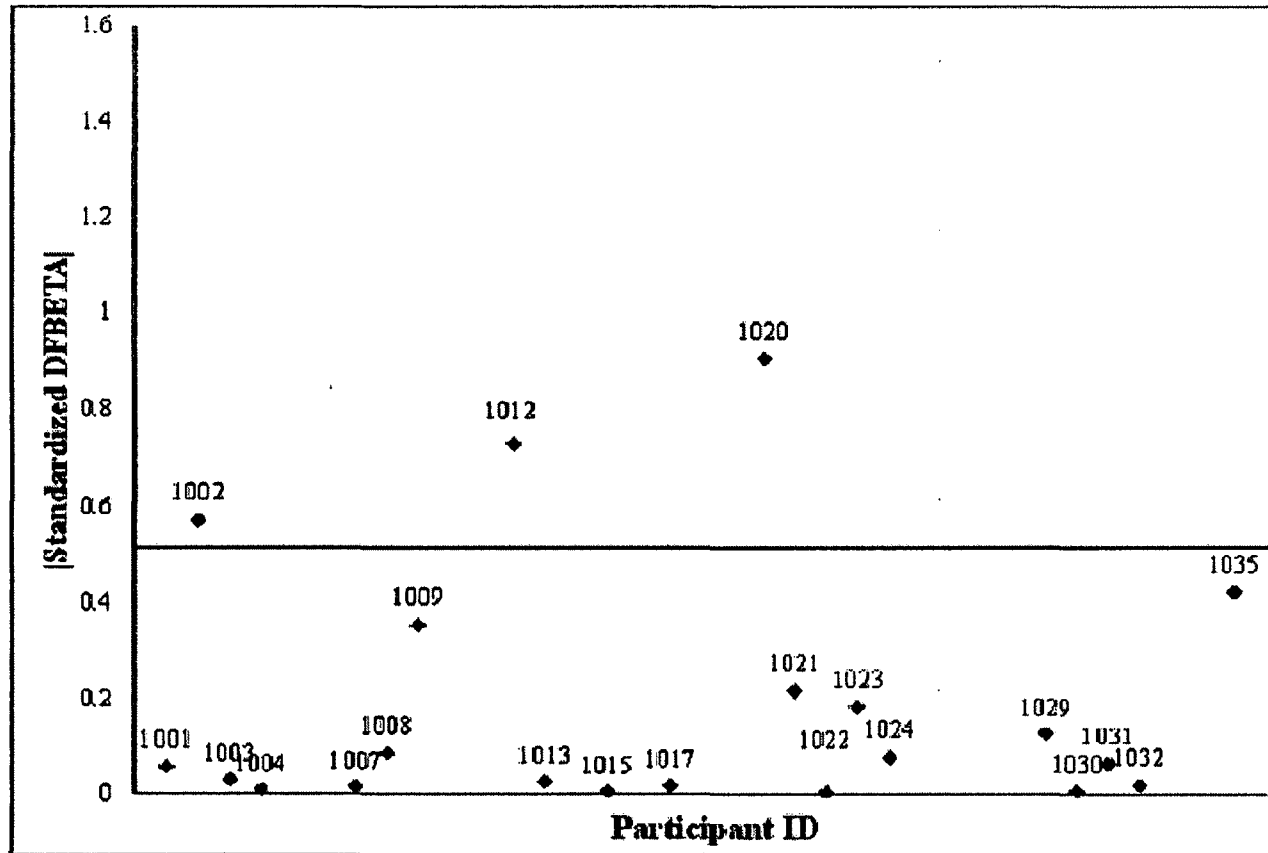


Figure 3. Case-wise measures of influence in linear regression of child's social communication deficit (SCQ) on parent's FFMQ facet of Describing. Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. SCQ = Social Communication Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire.

Table 10 and Figure 4 present data on participant level effects for the linear regression of the child's degree of social communication impairment (SCQ) on the mindfulness factor Acting with Awareness from the FFMQ. As detailed in Table 6, no statistically significant difference exists between the Acting with Awareness capacity of parents of non-clinical children as compared to parents of clinical children,  $t(19) = -0.32$ ,  $p = 0.75$ , Cohen's  $d = 0.15$ , 95% CI [-6.38, 4.69]. The Acting with Awareness factor accounts of a negligible amount of the variance in the child's social communication impairment,  $r^2 = 0.00$ ,  $b = 0.00$ , 95% CI for  $b$  [-0.58, 0.58]. Two participant dyads showed evidence of having notable influence of the regression: participant dyad 1002, Cook's  $D = 0.17$ , Standardized DFBETA = -0.47,  $b$  with case removed = -0.12; participant dyad 1020, Cook's  $D = 0.28$ , Standardized DFBETA = 0.67,  $b$  with case removed = 0.18,



Table 10

*Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Acting with Awareness*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.04	-0.01	-0.01
1002	0.17	-0.47**	-0.12	-0.12
1003	0.00	-0.02	0.00	0.00
1004	0.00	0.01	0.00	0.00
1007	0.01	-0.03	-0.01	-0.01
1008	0.02	-0.10	-0.03	-0.03
1009	0.16	-0.39	-0.10	-0.10
1012	0.01	0.11	0.03	0.03
1013	0.01	-0.13	-0.04	-0.04
1015	0.00	0.06	0.02	0.02
1017	0.00	-0.01	0.00	0.00
1020	0.28*	0.67**	0.18	0.18
1021	0.15	0.22	0.05	0.05
1022	0.00	-0.03	-0.01	-0.01
1023	0.02	0.13	0.04	0.04
1024	0.00	0.03	0.01	0.01
1029	0.05	0.21	0.06	0.06
1030	0.00	0.09	0.02	0.03
1031	0.01	-0.05	-0.02	-0.01
1032	0.00	-0.05	-0.01	-0.01
1035	0.07	-0.12	-0.03	-0.03

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff = .19 <sup>b</sup>Cutoff = .44

Figure 4. Influence Analysis of Regression of Child's Social Communication Impairment on Parent's Acting with Awareness

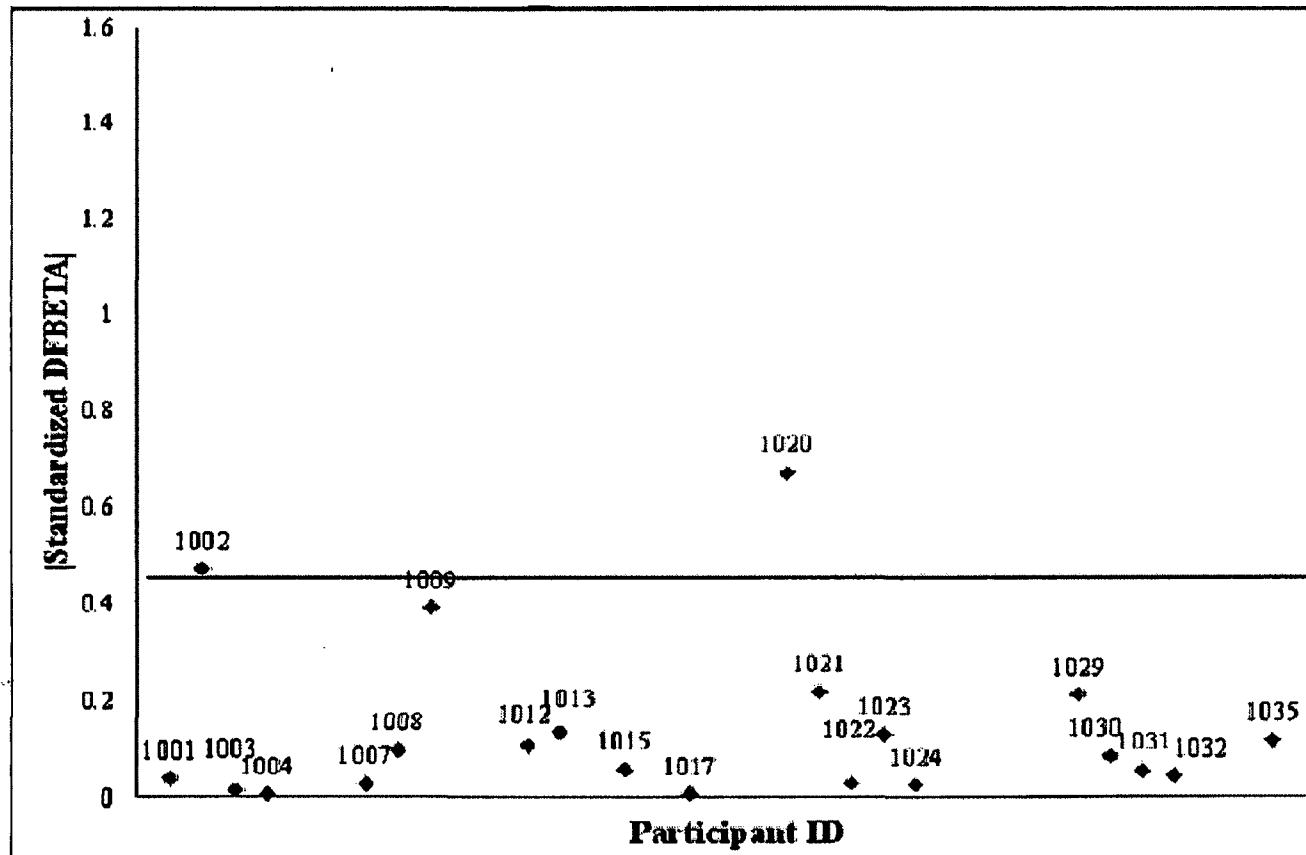


Figure 4. Case-wise measures of influence in linear regression of children's social communication deficit (SCQ) on parent's FFMQ facet of Acting With Awareness. Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. SCQ = Social Communication Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire

Table 11 and Figure 5 present data on participant level effects for the linear regression of the child's degree of social communication impairment (SCQ) on the mindfulness factor Non-judging of Inner Experience from the FFMQ. As detailed in Table 6, no statistically significant difference exists between the Non-judging of Inner Experience capacity of parents of non-clinical children as compared to parents of clinical children,  $t(19) 0.38, p = 0.70$ , Cohen's  $d = -0.18$ , 95% CI [-3.63, 5.27]. The Non-judging of Inner Experience factor accounts of a negligible amount of the variance in the child's social communication impairment,  $r^2 = 0.00$ ,  $b = -0.08$ , 95% CI for  $b$  [-0.79, 0.64]. Three participant dyads showed evidence of having notable influence of the regression: participant dyad 1012, Cook's  $D = 0.19$ , Standardized DFBETA = 0.58,  $b$  with case removed = 0.13; participant dyad 1020, Cook's  $D = 0.19$ , Standardized DFBETA = 0.50,  $b$  with case removed = 0.09; participant dyad 1009, Cook's  $D = 0.22$ , Standardized DFBETA = -0.54,  $b$  with case removed = -0.25,

Table 11

*Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Non-judging of Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.01	0.00	-0.07
1002	0.06	0.03	0.01	-0.06
1003	0.01	0.05	0.02	-0.06
1004	0.00	-0.06	-0.02	-0.10
1007	0.04	-0.24	-0.08	-0.16
1008	0.02	-0.06	-0.02	-0.10
1009	0.22*	-0.54**	-0.17	-0.25
1012	0.19	0.58**	0.20	0.13
1013	0.00	0.01	0.00	-0.07
1015	0.00	-0.02	-0.01	-0.08
1017	0.00	0.00	0.00	-0.07
1020	0.19	0.50**	0.16	0.09
1021	0.13	-0.05	-0.02	-0.09
1022	0.00	-0.02	-0.01	-0.08
1023	0.01	-0.02	-0.01	-0.08
1024	0.01	0.09	0.03	-0.04
1029	0.03	-0.08	-0.03	-0.10
1030	0.00	0.00	0.00	-0.07
1031	0.03	-0.17	-0.06	-0.14
1032	0.01	0.06	0.02	-0.05
1035	0.07	0.13	0.04	-0.03

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff = .19 <sup>b</sup>Cutoff = .44

Figure 5. Influence Analysis of Regression of Child's Social Communication Impairment on Parent's Non-judging of Inner Experience

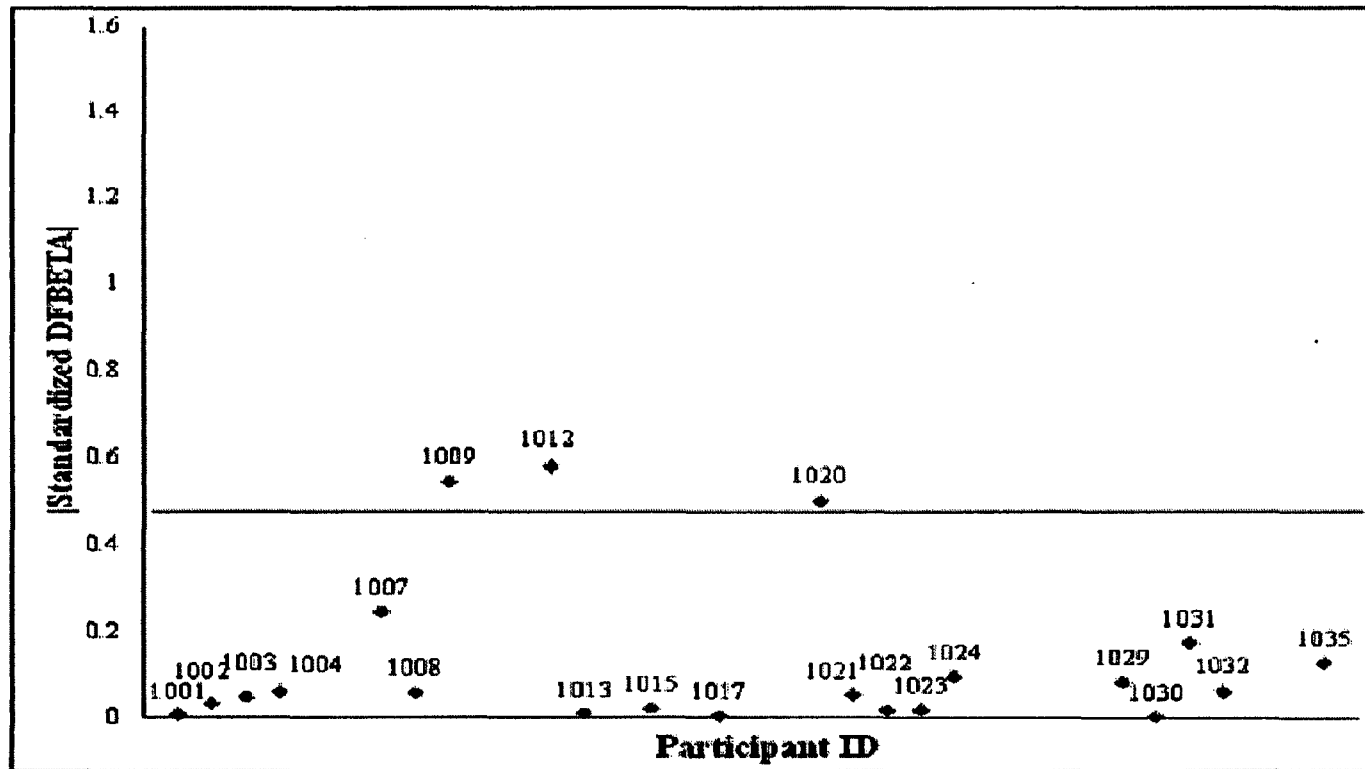


Figure 5. Case-wise measures of influence in linear regression of children's social communication deficit (SCQ) on parent's FFMQ facet of Non-judging of Inner Experience. Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. SCQ = Social Communication Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire

Table 12 and Figure 6 present data on participant level effects for the linear regression of the child's degree of social communication impairment (SCQ) on the mindfulness factor Non-reactivity to Inner Experience from the FFMQ. As detailed in Table 6, no statistically significant difference exists between the Non-reactivity to Inner Experience capacity of parents of non-clinical children as compared to parents of clinical children,  $t(19) -1.37, p = 0.19$ , Cohen's  $d = 0.63$ , 95% CI [-5.38, 1.13]. The Non-reactivity to Inner Experience factor accounts of a negligible amount of the variance in the child's social communication impairment,  $r^2 = 0.01$ ,  $b = -0.15$ , 95% CI for  $b$  [-1.09, 0.79]. Two participant dyads showed evidence of having notable influence of the regression: participant dyad 1021, Cook's  $D = 0.23$ , Standardized DFBETA = 0.48,  $b$  with case removed = 0.03; participant dyad 1035, Cook's  $D = 0.24$ , Standardized DFBETA = 0.58,  $b$  with case removed = 0.09.

Table 12

*Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Non-reactivity to Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.01	0.00	-0.16
1002	0.07	-0.17	-0.07	-0.23
1003	0.00	-0.02	-0.01	-0.16
1004	0.00	0.02	0.01	-0.14
1007	0.02	-0.14	-0.07	-0.22
1008	0.02	-0.13	-0.06	-0.21
1009	0.16	-0.42	-0.17	-0.33
1012	0.00	-0.04	-0.02	-0.17
1013	0.01	-0.07	-0.03	-0.19
1015	0.00	0.01	0.00	-0.15
1017	0.00	0.00	0.00	-0.15
1020	0.07	-0.13	-0.06	-0.21
1021	0.23*	0.48**	0.19	0.03
1022	0.00	-0.01	0.00	-0.16
1023	0.09	0.38	0.17	0.02
1024	0.00	0.03	0.02	-0.14
1029	0.04	-0.18	-0.08	-0.24
1030	0.01	0.11	0.05	-0.10
1031	0.01	-0.07	-0.03	-0.19
1032	0.01	-0.10	-0.05	-0.20
1035	0.24*	0.58**	0.25	0.09

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA; SCQ = Social Communication Questionnaire.

<sup>a</sup>Cutoff = .19 <sup>b</sup>Cutoff = .44

Figure 6. Influence Analysis of Regression of Child's Social Communication Impairment (SCQ) on Parent's Non-reactivity to Inner Experience

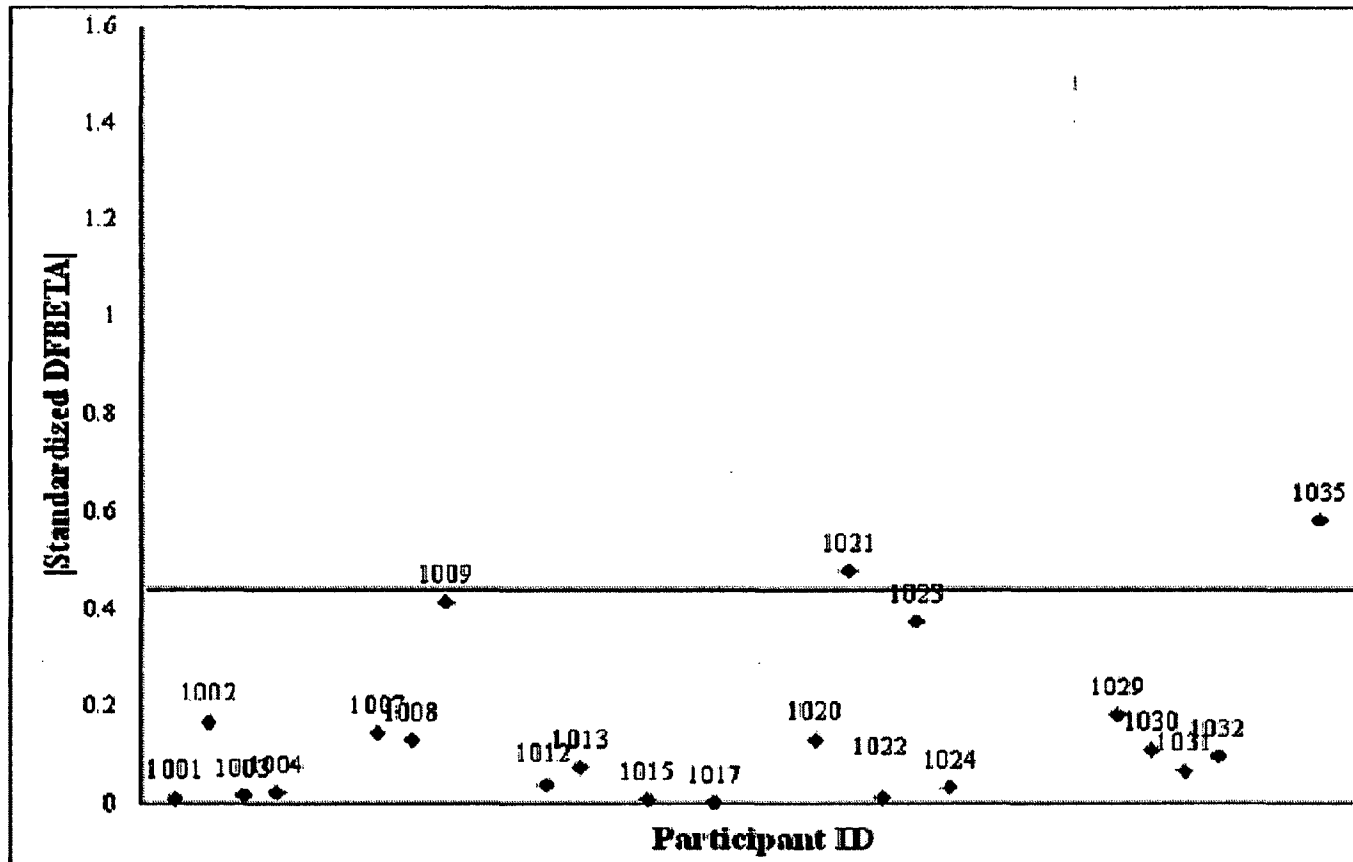


Figure 6. Case-wise measures of influence in linear regression of children's social communication deficit (SCQ) on parent's FFMQ facet of Non-reactivity to Inner Experience. Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. SCQ = Social Communication Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire



*Hypothesis 3. Parental mindfulness and total parent stress will be significantly inverse-correlated for all parent populations.*

Two parents provided PSI records that triggered the built-in validity indicator of the instrument: participant 1015; participant 1024. Due to this response style, data from these two participants were removed from analyses for this hypothesis. As all parents in this sample had children with a previously identified autism spectrum disorder, all remaining parents were included in these analyses. Regression coefficients for all mindfulness factors were negative except Non-judging of Inner Experience,  $b = 0.875$ , 95% CI for  $b$  [-2.92, 4.67]. Table 13 describes mean difference analyses by mindfulness factor between parents for whom support was clinically indicated due to high stress levels and those whose stress levels did not warrant such a referral. Table 14 provides an overview of the five single-predictor linear regressions of Total Parent Stress from the PSI on the facets of mindfulness from the FFMQ. Two mindfulness factors were notably different between the parent groups with large effect sizes: Describing,  $t(17) = -1.19$ ,  $p = 0.25$ ,  $d = 0.65$ ; and Non-reactivity to Inner Experience,  $t(17) = -1.47$ ,  $p = 0.16$ ,  $d = 0.81$ .

Table 13

*Mean Difference Analyses Between Stress Indications on Mindfulness Factors*

FFMQ Dimension	PSI Warrants Clinical Referral?						95% CI		Cohen's <i>d</i>
	Not Indicated (n=5)		Indicated (n=14)		<i>t</i> (17)	<i>p</i>			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Observing	27.00	3.32	23.93	6.47	-1.00	0.33	-9.54	3.40	0.55
Describing	33.80	5.02	31.07	4.21	-1.19	0.25	-7.58	2.13	0.65
Acting With Awareness	29.80	4.60	28.07	6.40	-0.55	0.59	-8.35	4.90	0.30
Non-judging of Inner Experience	30.80	1.79	30.86	5.59	0.02	0.98	-5.40	5.51	-0.01
Non-reactivity to Inner Experience	24.40	1.67	21.57	4.13	-1.47	0.16	-6.89	1.24	0.81

*Note.* PSI = Parenting Stress Index (Total Stress); FFMQ = Five Factor Mindfulness Questionnaire; CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Table 14

*Overview of Models Predicting Total Parent Stress (PSI) from Mindfulness Factors (FFMQ)*

Mindfulness Factor	$r^2$	<i>b</i>	<i>SE<sub>b</sub></i>	<i>B</i>	<i>t</i>	<i>p</i>	95% CI for <i>b</i>	
							<i>LL</i>	<i>UL</i>
Observing	0.05	-1.34	1.45	-0.22	-0.92	0.37	-4.39	1.72
Describing	0.03	-1.40	1.93	-0.17	-0.73	0.48	-5.46	2.66
Acting With Awareness	0.14	-2.28	1.37	-0.37	-1.67	0.11	-5.17	0.61
Non-judging of Inner Experience	0.01	0.88	1.80	0.12	0.49	0.63	-2.92	4.67
Non-reactivity to Inner Experience	0.40	-5.97	1.77	-0.63	-3.37	0.00	-9.71	-2.23

*Note.* PSI = Parenting Stress Index; FFMQ = Five Factor Mindfulness Questionnaire; CI = confidence interval; *LL* = lower limit; *UL* = upper limit

Table 15 and Figure 7 present data on participant level effects for the linear regression of the parent's degree of Total Parenting Stress (PSI) on the mindfulness factor Observing from the FFMQ. As detailed in Table 13, no statistically significant difference exists between the Observing capacity of parents in need of a referral for supportive services due to reporting significant amounts of stress as compared to parents who do not endorse such serious amounts of stress,  $t(17) = -1.00, p = 0.33$ , Cohen's  $d = 0.55$ , 95% CI [-9.54, 3.40]. The Observing factor accounts for 5% of the variance in the parent's Total Stress experience,  $r^2 = 0.05$ ,  $b = -1.34$ , 95% CI for  $b$  [-4.39, 1.72]. Two participants showed evidence of having notable influence on this regression: participant dyad 1007, Cook's  $D = 0.14$ , Standardized DFBETA = 0.48,  $b$  with case removed = -0.63; participant dyad 1032, Cook's  $D = 0.27$ , Standardized DFBETA = -0.68,  $b$  with case removed = -2.30.

Table 15

*Influence Analysis of Regression of Parent's Total Stress on Mindful Observing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.06	0.09	-1.24
1002	0.08	-0.09	-0.12	-1.46
1003	0.07	-0.20	-0.27	-1.61
1004	0.02	-0.03	-0.04	-1.38
1007	0.14	0.48**	0.70	-0.63
1008	0.01	0.05	0.07	-1.27
1009	0.05	0.12	0.17	-1.17
1012	0.00	0.01	0.02	-1.32
1013	0.01	0.05	0.08	-1.26
1015				
1017	0.05	0.18	0.26	-1.07
1020	0.03	-0.07	-0.10	-1.43
1021	0.00	-0.02	-0.02	-1.36
1022	0.01	-0.11	-0.17	-1.50
1023	0.02	0.18	0.27	-1.07
1024				
1029	0.10	0.21	0.29	-1.05
1030	0.09	-0.13	-0.18	-1.51
1031	0.00	0.02	0.02	-1.31
1032	0.27*	-0.68**	-0.96	-2.30
1035	0.01	-0.08	-0.11	-1.45

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = .21 <sup>b</sup>Cutoff = .46

Figure 7. Influence Analysis of Regression of Parent's Total Stress on Mindful Observing

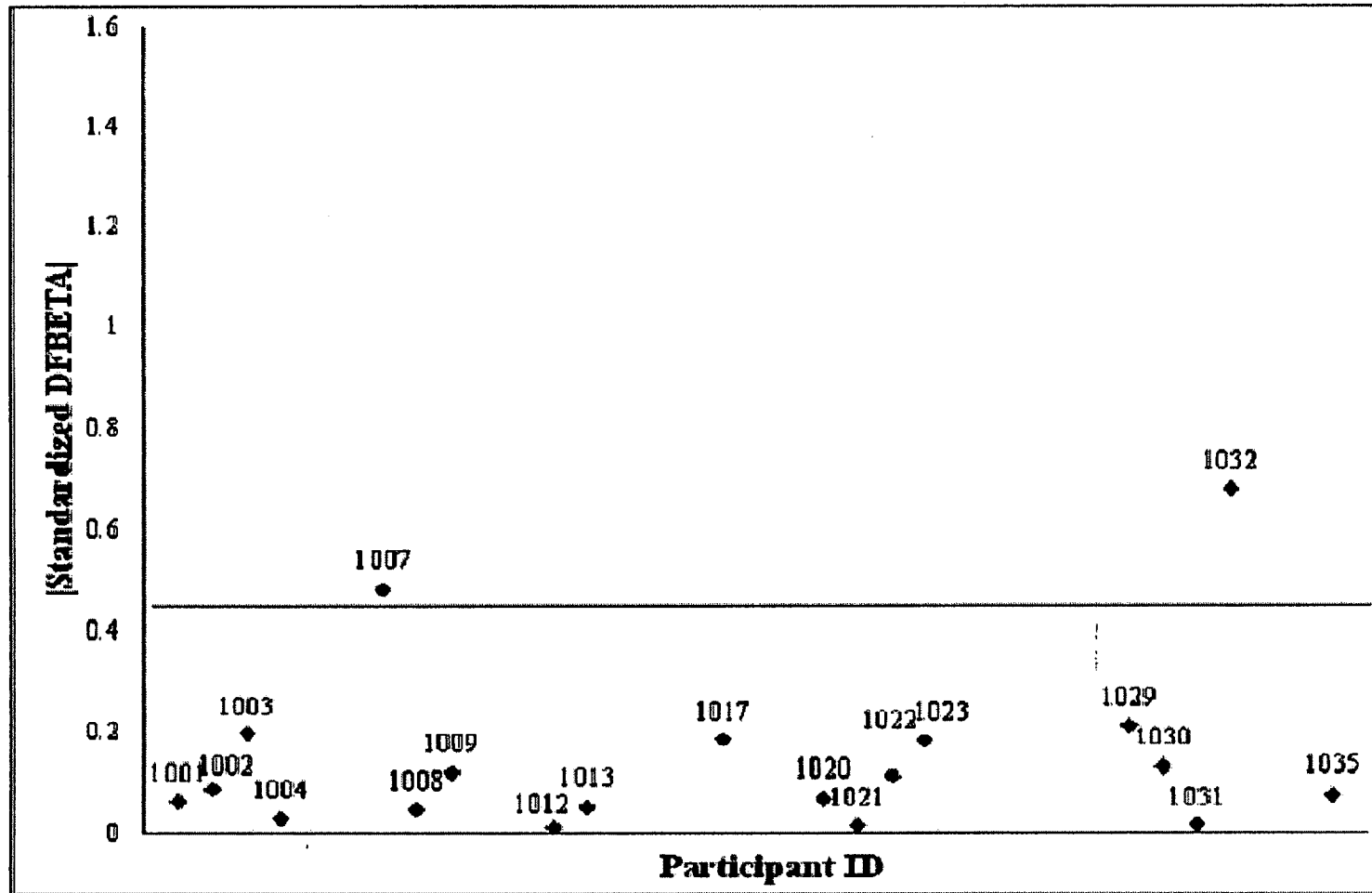


Figure 7. Case-wise measures of influence in linear regression of parent's total stress (PSI) on parent's mindfulness factor of Observing (FFMQ). Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; FFMQ = Five Facet Mindfulness Questionnaire

Table 16 and Figure 8 present data on participant level effects for the linear regression of the parent's degree of Total Parenting Stress (PSI) on the mindfulness factor Describing from the FFMQ. As detailed in Table 13, no statistically significant difference exists between the Describing capacity of parents in need of a referral for supportive services due to reporting significant amounts of stress as compared to parents who do not endorse such serious amounts of stress,  $t(17) = -1.19$ ,  $p = 0.25$ , Cohen's  $d = 0.65$ , 95% CI [-7.58, 2.13]. The Describing factor accounts for 3% of the variance in the parent's Total Stress experience,  $r^2 = 0.03$ ,  $b = -1.40$ , 95% CI for  $b$  [-5.46, 2.66]. Three participants showed evidence of having notable influence on this regression: participant 1002, Cook's  $D = 0.34$ , Standardized DFBETA = -0.76,  $b$  with case removed = -2.80; participant 1012, Cook's  $D = 0.19$ , Standardized DFBETA = 0.55,  $b$  with case removed = -0.33; participant 1020, Cook's  $D = 0.17$ , Standardized DFBETA = 0.49,  $b$  with case removed = -0.48.

Table 16

*Influence Analysis of Regression of Parent's Total Stress on Mindful Describing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.00	0.00	-1.40
1002	0.34*	-0.76**	-1.40	-2.80
1003	0.07	-0.18	-0.33	-1.73
1004	0.08	0.27	0.52	-0.88
1007	0.00	0.00	0.01	-1.40
1008	0.01	-0.06	-0.12	-1.52
1009	0.05	-0.22	-0.41	-1.82
1012	0.19	0.55**	1.07	-0.33
1013	0.00	-0.05	-0.09	-1.50
1015				
1017	0.02	-0.11	-0.22	-1.62
1020	0.17	0.49**	0.92	-0.48
1021	0.00	-0.02	-0.04	-1.44
1022	0.01	-0.09	-0.18	-1.58
1023	0.00	0.06	0.11	-1.29
1024				
1029	0.08	-0.19	-0.36	-1.76
1030	0.12	0.24	0.43	-0.97
1031	0.00	0.04	0.07	-1.33
1032	0.08	-0.22	-0.41	-1.81
1035	0.08	0.32	0.61	-0.79

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = .21 <sup>b</sup>Cutoff = .46

Figure 8. Influence Analysis of Regression of Parent's Total Stress on Mindful Describing

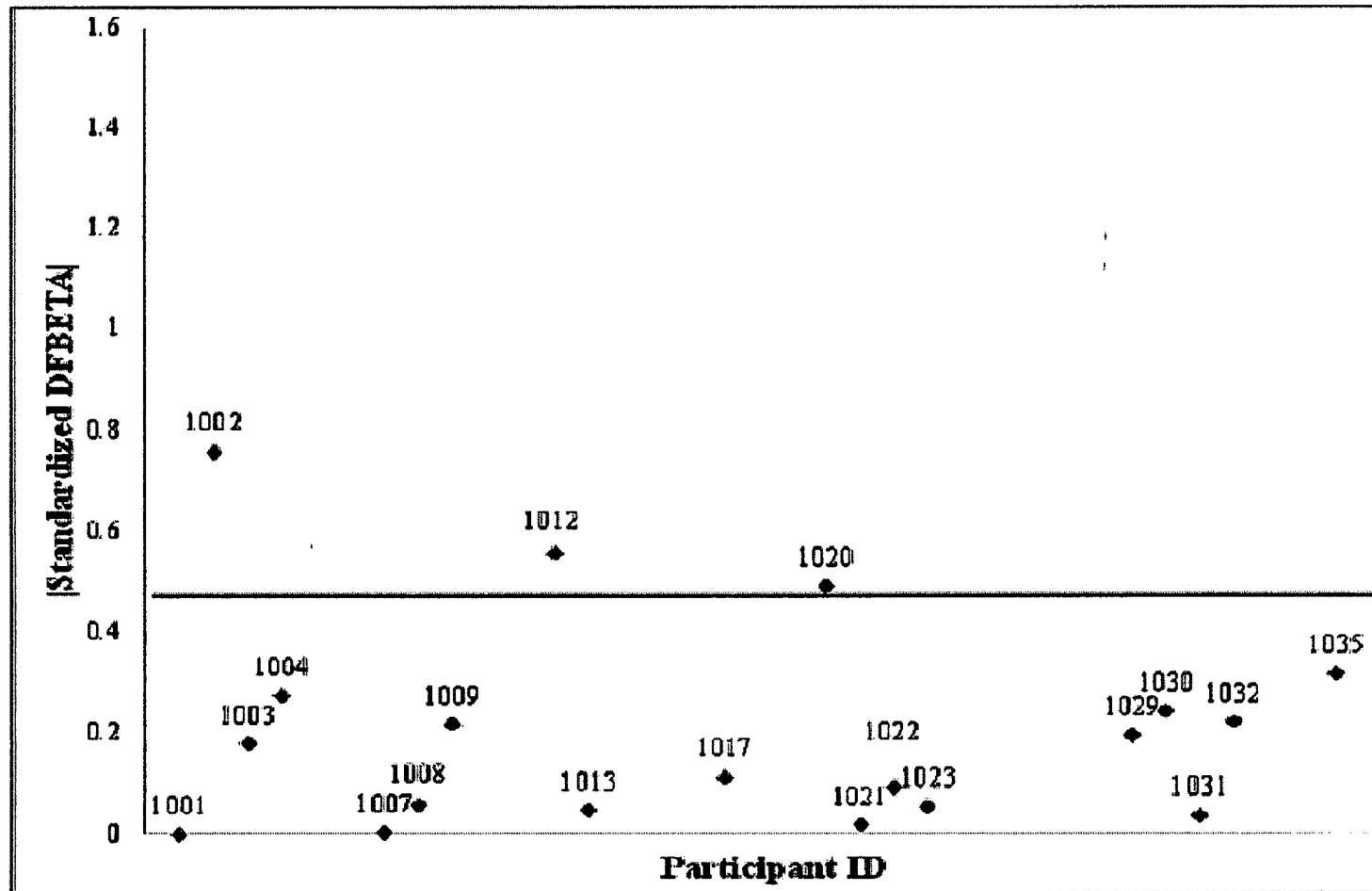


Figure 8. Case-wise measures of influence in linear regression of parent's total stress (PSI) on parent's mindfulness factor of Describing (FFMQ). Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; FFMQ = Five Facet Mindfulness Questionnaire



Table 17 and Figure 9 present data on participant level effects for the linear regression of the parent's degree of Total Parenting Stress (PSI) on the mindfulness factor Acting with Awareness from the FFMQ. As detailed in Table 13, no statistically significant difference exists between the Acting with Awareness capacity of parents in need of a referral for supportive services due to reporting significant amounts of stress as compared to parents who do not endorse such serious amounts of stress,  $t(17) = -0.55$ ,  $p = 0.59$ , Cohen's  $d = 0.30$ , 95% CI [-8.35, 4.90]. The Acting with Awareness factor accounts for 14% of the variance in the parent's Total Stress experience,  $r^2 = 0.14$ ,  $b = -2.28$ , 95% CI for  $b$  [-5.17, 0.61]. Two participants showed evidence of having notable influence on this regression: participant 1020, Cook's  $D = 0.42$ , Standardized DFBETA = 0.86,  $b$  with case removed = -1.20; participant 1030, Cook's  $D = 0.36$ , Standardized DFBETA = -0.80,  $b$  with case removed = -3.37.

Table 17

*Influence Analysis of Regression of Parent's Total Stress on Acting with Awareness*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.01	0.08	0.11	-2.17
1002	0.14	-0.42	-0.57	-2.85
1003	0.07	-0.09	-0.12	-2.40
1004	0.03	-0.02	-0.03	-2.31
1007	0.00	0.02	0.03	-2.25
1008	0.01	-0.06	-0.08	-2.36
1009	0.04	-0.17	-0.24	-2.52
1012	0.05	0.24	0.33	-1.95
1013	0.00	0.07	0.10	-2.18
1015				
1017	0.02	-0.11	-0.15	-2.44
1020	0.42*	0.86**	1.08	-1.20
1021	0.01	0.05	0.07	-2.22
1022	0.01	-0.06	-0.09	-2.37
1023	0.01	0.08	0.11	-2.17
1024				
1029	0.20	0.43	0.53	-1.75
1030	0.36*	-0.80**	-1.09	-3.37
1031	0.00	-0.02	-0.02	-2.30
1032	0.07	-0.20	-0.27	-2.55
1035	0.02	0.05	0.07	-2.21

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = .21 <sup>b</sup>Cutoff = .46

Figure 9. Influence Analysis of Regression of Parent's Total Stress on Acting with Awareness

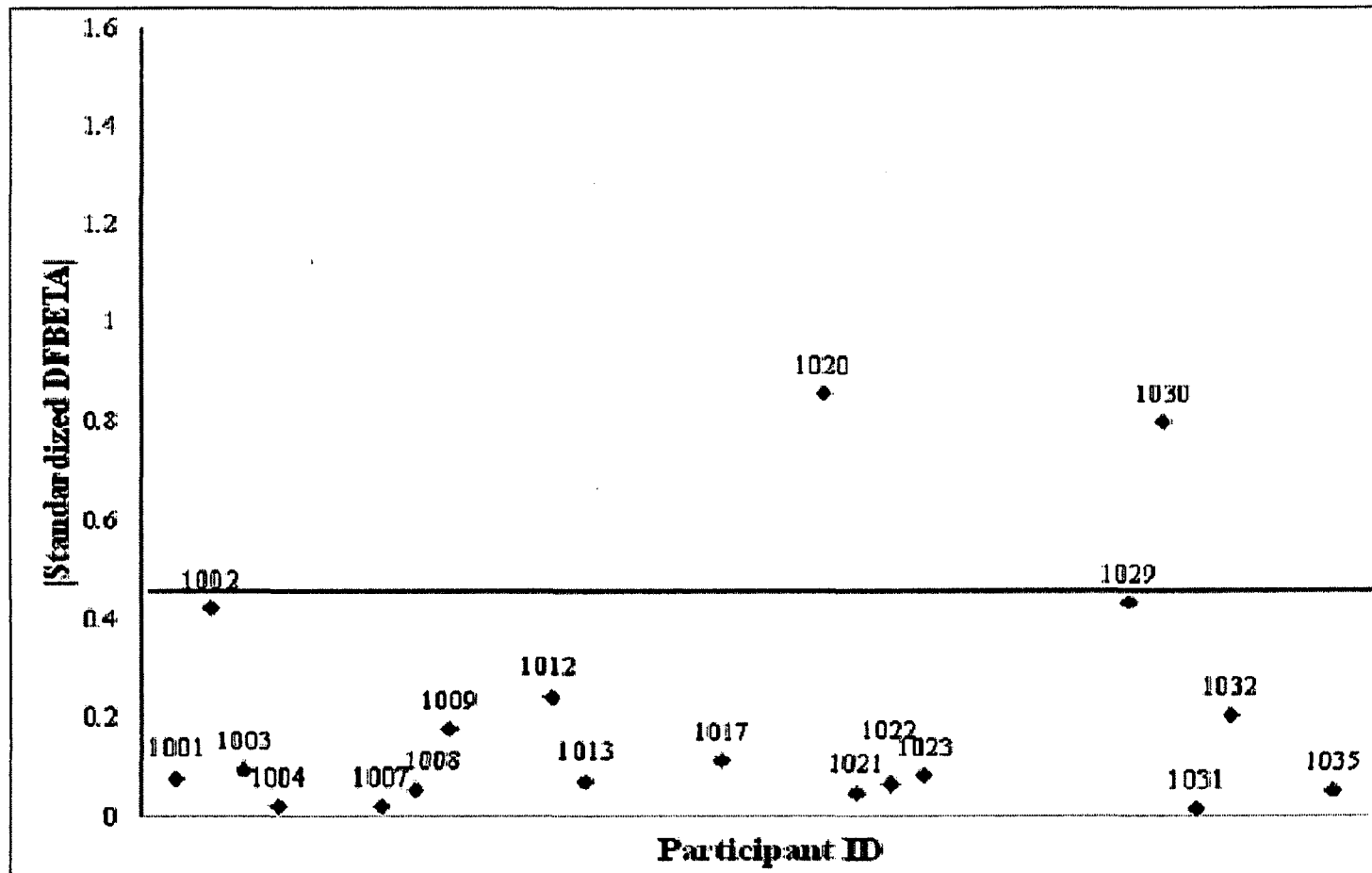


Figure 9. Case-wise measures of influence in linear regression of parent's total stress (PSI) on parent's mindfulness factor of Acting With Awareness (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; FFMQ = Five Facet Mindfulness Questionnaire

Table 18 and Figure 10 present data on participant level effects for the linear regression of the parent's degree of Total Parenting Stress (PSI) on the mindfulness factor Non-judging of Inner Experience from the FFMQ. As detailed in Table 13, no statistically significant difference exists between the Non-judging of Inner Experience capacity of parents in need of a referral for supportive services due to reporting significant amounts of stress as compared to parents who do not endorse such serious amounts of stress,  $t(17) = 0.02$ ,  $p = 0.98$ , Cohen's  $d = -0.01$ , 95% CI [-5.40, 5.51]. The Non-judging of Inner Experience factor accounts for 1% of the variance in the parent's Total Stress experience,  $r^2 = 0.01$ ,  $b = 0.88$ , 95% CI for  $b$  [-2.92, 4.67]. No participant showed evidence of having notable influence on this regression.

Table 18

*Influence Analysis of Regression of Parent's Total Stress on Non-judging of Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.01	-0.01	0.87
1002	0.07	0.07	0.12	1.00
1003	0.08	0.21	0.37	1.25
1004	0.06	0.27	0.49	1.36
1007	0.00	0.03	0.05	0.93
1008	0.01	-0.04	-0.06	0.81
1009	0.14	-0.42	-0.74	0.13
1012	0.00	0.04	0.07	0.94
1013	0.00	0.01	0.03	0.90
1015				
1017	0.06	-0.25	-0.44	0.43
1020	0.05	0.24	0.44	1.31
1021	0.00	-0.01	-0.02	0.85
1022	0.01	-0.04	-0.07	0.80
1023	0.00	0.00	0.00	0.87
1024				
1029	0.08	-0.10	-0.17	0.70
1030	0.09	-0.08	-0.13	0.74
1031	0.01	-0.12	-0.22	0.66
1032	0.08	0.24	0.41	1.28
1035	0.01	-0.04	-0.07	0.80

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = .21 <sup>b</sup>Cutoff = .46

Figure 10. Influence Analysis of Regression of Parent's Total Stress on Non-judging of Inner Experience

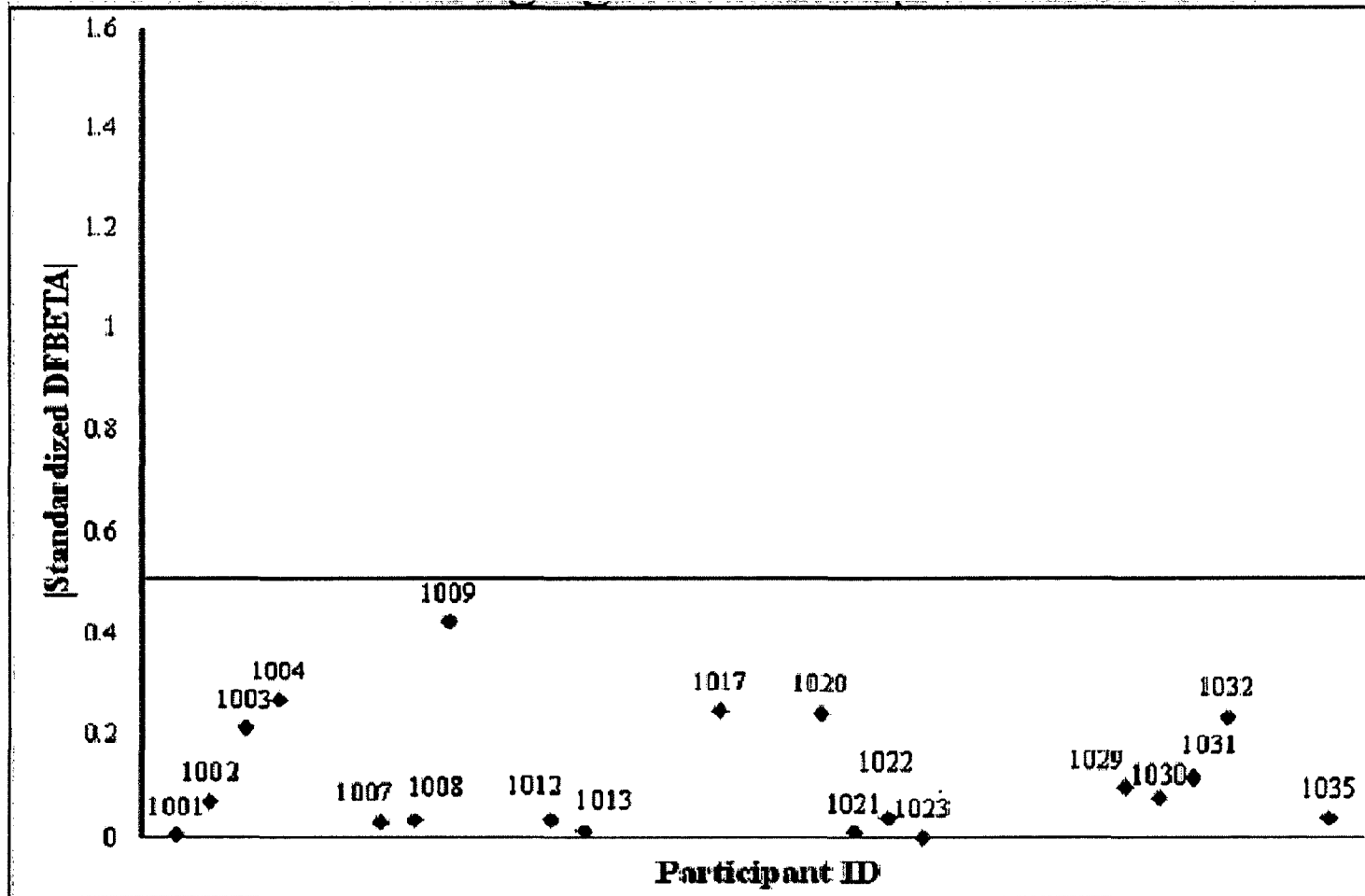


Figure 10. Case-wise measures of influence in linear regression of parent's total stress (PSI) on parent's mindfulness factor of Non-judging of Inner Experience (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; FFMQ = Five Facet Mindfulness Questionnaire

Table 19 and Figure 11 present data on participant level effects for the linear regression of the parent's degree of Total Parenting Stress (PSI) on the mindfulness factor Non-reactivity to Inner Experience from the FFMQ. As detailed in Table 13, no statistically significant difference exists between the Non-reactivity to Inner Experience capacity of parents in need of a referral for supportive services due to reporting significant amounts of stress as compared to parents who do not endorse such serious amounts of stress,  $t(17) = -1.47$ ,  $p = 0.16$ , Cohen's  $d = 0.81$ , 95% CI [-6.89, 1.24]. The Non-reactivity to Inner Experience factor accounts for 40% of the variance in the parent's Total Stress experience,  $r^2 = 0.40$ ,  $b = -5.97$ , 95% CI for  $b$  [-9.71, -2.23]. One participant showed evidence of having notable influence on this regression: participant 1023, Cook's  $D = 0.34$ , Standardized DFBETA = 0.76,  $b$  with case removed = -4.70.

Table 19

*Influence Analysis of Regression of Parent's Total Stress on Non-reactivity to Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.01	0.02	-5.95
1002	0.10	-0.20	-0.33	-6.30
1003	0.09	-0.08	-0.14	-6.10
1004	0.03	-0.08	-0.14	-6.11
1007	0.08	0.28	0.48	-5.48
1008	0.00	-0.03	-0.06	-6.03
1009	0.03	-0.16	-0.29	-6.26
1012	0.00	-0.01	-0.02	-5.99
1013	0.01	0.08	0.14	-5.83
1015				
1017	0.04	0.05	0.09	-5.88
1020	0.03	-0.08	-0.15	-6.12
1021	0.04	0.16	0.29	-5.68
1022	0.01	-0.03	-0.05	-6.02
1023	0.34*	0.76**	1.27	-4.70
1024				
1029	0.10	-0.27	-0.46	-6.43
1030	0.12	-0.41	-0.73	-6.70
1031	0.00	0.00	-0.01	-5.98
1032	0.00	0.09	0.16	-5.81
1035	0.00	0.04	0.08	-5.89

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = .21 <sup>b</sup>Cutoff = .46



Figure 11. Influence Analysis of Regression of Parent's Total Stress on Non-reactivity to Inner Experience

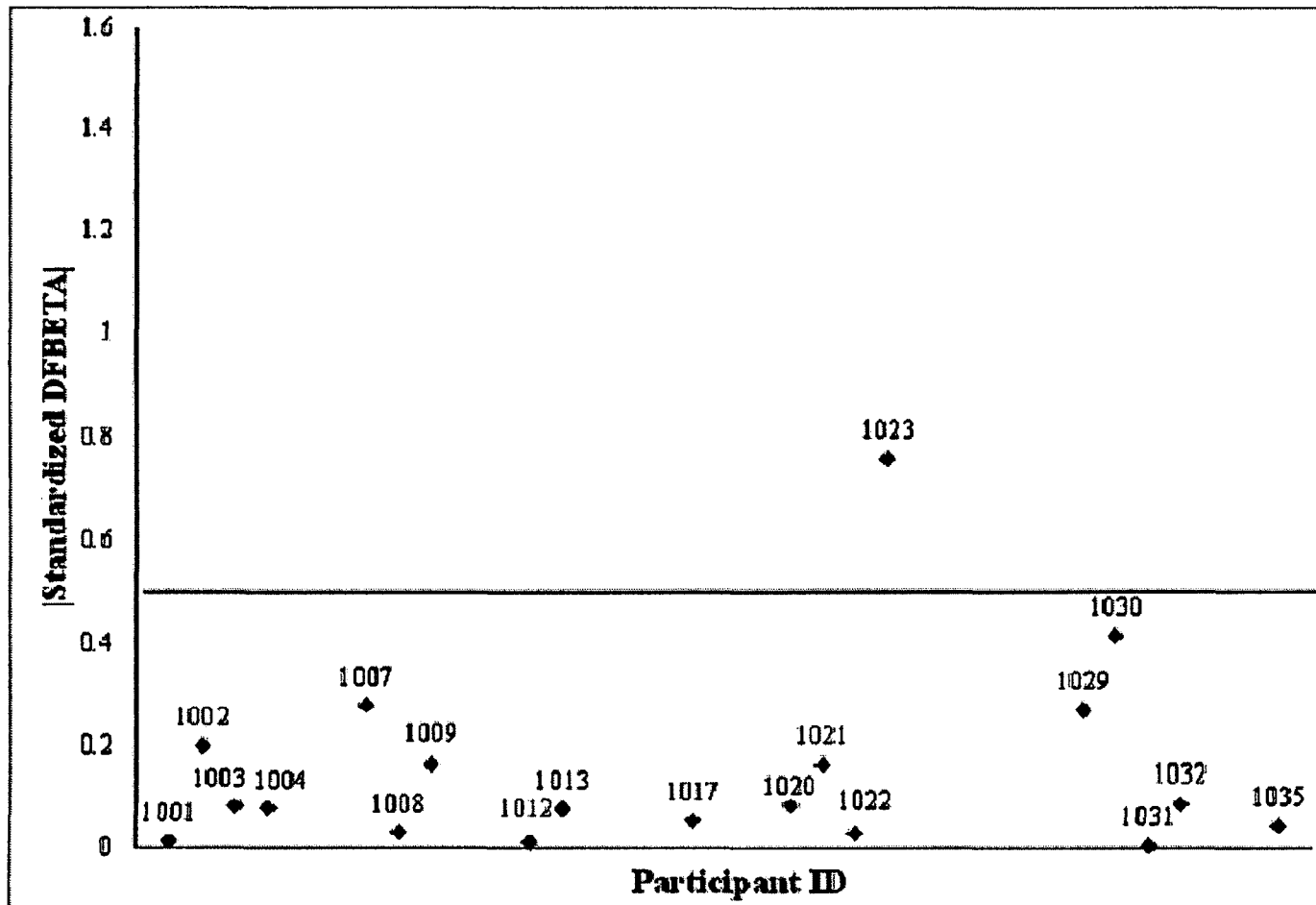


Figure 11. Case-wise measures of influence in linear regression of parent's total stress (PSI) on parent's mindfulness factor of Non-reactivity to Inner Experience (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.46. PSI = Parenting Stress Index; FFMQ = Five Facet Mindfulness Questionnaire

*Hypothesis 4. Parent mindfulness will be significantly (positively) correlated with child's theory of mind for all parent/child populations.*

Each factor of parental mindfulness exhibits a positive correlation with a child's theory of mind score. However, the strength of these associations is generally weak, with only one factor, Non-judging of Inner Experience, approaching statistical significance ( $r^2 = 0.15$ ,  $b = 0.45$ ,  $p = 0.08$ , 95% CI for  $b$  [-0.06, 0.95]. See Table 20 for data on the models associated with the five mindfulness facets and the child's theory of mind.

Tables 21 through 25 present influence analyses for linear regression of children's theory of mind development on the five individual mindfulness factors. Participant 1031 is notable for affecting each of these models, as evidenced by Cook's D and Standardized DFBETA indices above the size-adjusted cutoffs.

Table 20

*Model Summary for Mindfulness Facets Predicting Theory of Mind*

Mindfulness Factor	$r^2$	$b$	$SE_b$	$B$	$t$	$p$	95% CI for $b$	
							$LL$	$UL$
Observing	0.10	0.30	0.21	0.31	1.43	0.17	-0.14	0.75
Describing	0.02	0.18	0.29	0.14	0.61	0.55	-0.43	0.78
Acting With Awareness	0.00	0.04	0.21	0.04	0.19	0.85	-0.40	0.48
Non-judging of Inner Experience	0.15	0.45	0.24	0.39	1.84	0.08	-0.06	0.95
Non-reactivity to Inner Experience	0.01	0.18	0.34	0.12	0.52	0.61	-0.54	0.89

*Note.* FFMQ = Five Factor Mindfulness Questionnaire; CI = confidence interval;  $LL$  = lower limit;  $UL$  = upper limit.

Table 21 and Figure 12 present data on participant level effects for the linear regression of the child's theory of mind development on the mindfulness factor Observing from the FFMQ. The Observing factor accounts for 10% of the variance in the child's theory of mind development,  $r^2 = 0.10$ ,  $b = 0.30$ , 95% CI for  $b$  [-0.14, 0.75]. One participant dyad showed evidence of having notable influence on this regression: participant 1031, Cook's  $D = 0.95$ , Standardized DFBETA = 1.55,  $b$  with case removed = 0.55.

Table 21

*Influence Analysis of Regression of Child's Theory of Mind on Parent's Mindful Observing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.08	-0.02	0.29
1002	0.01	-0.03	-0.01	0.29
1003	0.01	-0.08	-0.02	0.28
1004	0.08	-0.06	-0.01	0.29
1007	0.01	0.14	0.03	0.33
1008	0.00	-0.02	0.00	0.30
1009	0.01	-0.05	-0.01	0.29
1012	0.00	0.01	0.00	0.30
1013	0.09	-0.20	-0.04	0.26
1015	0.04	-0.10	-0.02	0.28
1017	0.03	-0.15	-0.03	0.27
1020	0.02	0.06	0.01	0.32
1021	0.01	0.05	0.01	0.31
1022	0.02	-0.16	-0.03	0.27
1023	0.00	0.04	0.01	0.31
1024	0.00	-0.02	0.00	0.30
1029	0.00	0.03	0.01	0.31
1030	0.00	-0.02	0.00	0.30
1031	0.95*	1.55**	0.25	0.55
1032	0.05	-0.28	-0.06	0.24
1035	0.05	-0.16	-0.03	0.27

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = 0.19 <sup>b</sup>Cutoff = 0.44

Figure 12. Influence Analysis of Regression of Child's Theory of Mind on Parent's Mindful Observing

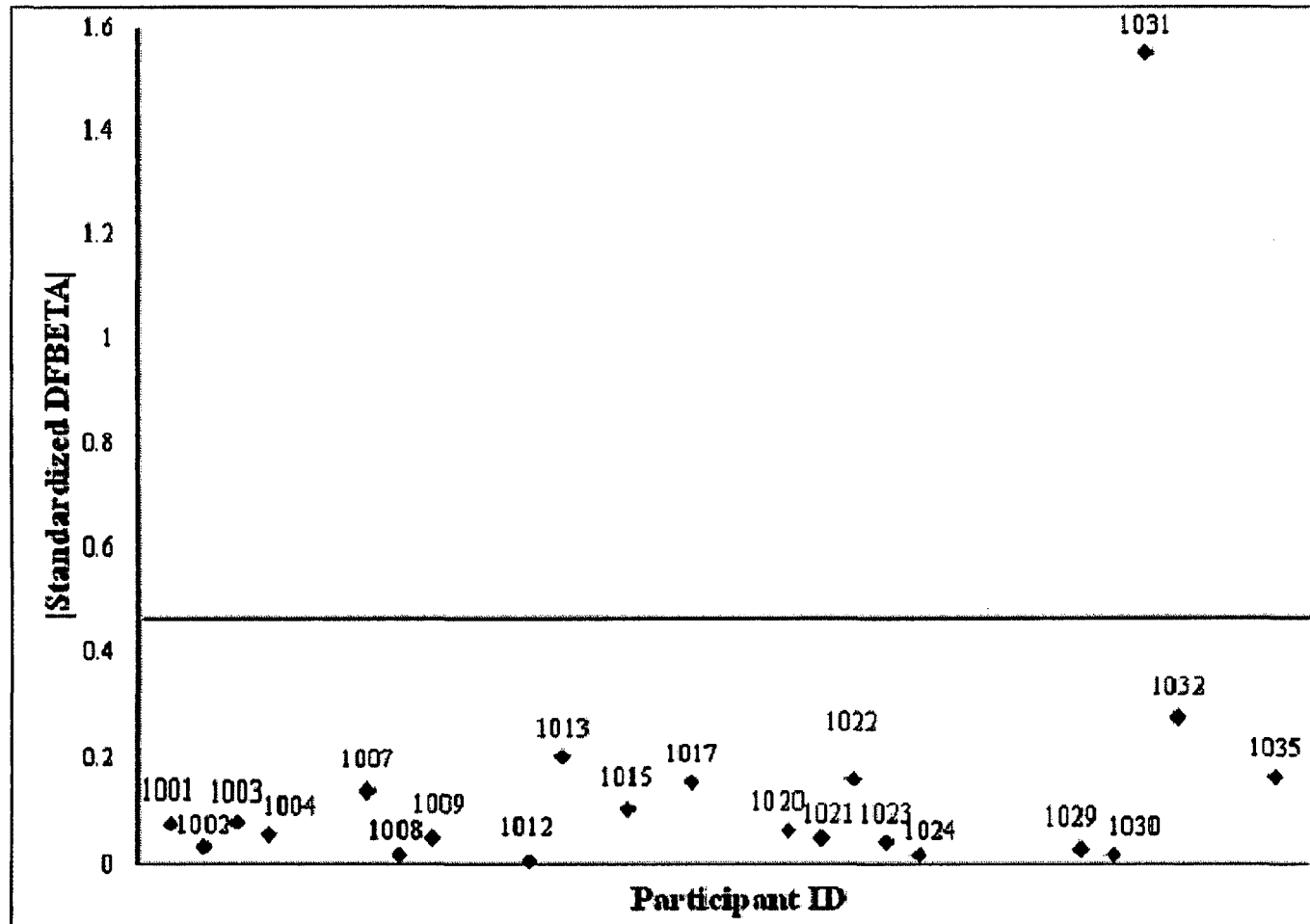


Figure 12. Case-wise measures of influence in linear regression of child's theory of mind development on parent's mindfulness factor of Observing (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. FFMQ = Five Facet Mindfulness Questionnaire

Table 22 and Figure 13 present data on participant level effects for the linear regression of the child's theory of mind development on the mindfulness factor Describing from the FFMQ. The Describing factor accounts for 2% of the variance in the child's theory of mind development,  $r^2 = 0.02$ ,  $b = 0.18$ , 95% CI for  $b$  [-0.43, 0.78]. Three participant-dyads showed evidence of having notable influence on this regression: participant-dyad1002, Cook's  $D = 0.15$ , Standardized DFBETA = -0.49,  $b$  with case removed = 0.03; participant-dyad 1020, Cook's  $D = 0.15$ , Standardized DFBETA = -0.46,  $b$  with case removed = 0.04; 1031, Cook's  $D = 0.29$ , Standardized DFBETA = -0.38,  $b$  with case removed = 0.10.

Table 22

*Influence Analysis of Regression of Child's Theory of Mind on Parent's Mindful Describing*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.02	0.01	0.18
1002	0.15	-0.49**	-0.14	0.03
1003	0.01	-0.06	-0.02	0.16
1004	0.13	0.39	0.11	0.28
1007	0.02	0.02	0.01	0.18
1008	0.00	0.01	0.00	0.18
1009	0.00	0.06	0.02	0.19
1012	0.00	-0.06	-0.02	0.16
1013	0.10	0.33	0.09	0.27
1015	0.02	0.08	0.02	0.20
1017	0.01	0.07	0.02	0.20
1020	0.15	-0.46**	-0.13	0.04
1021	0.02	0.06	0.02	0.19
1022	0.00	-0.06	-0.02	0.16
1023	0.01	0.09	0.03	0.20
1024	0.00	-0.03	-0.01	0.17
1029	0.01	-0.06	-0.02	0.16
1030	0.00	0.01	0.00	0.18
1031	0.29*	-0.38	-0.08	0.10
1032	0.00	0.02	0.01	0.18
1035	0.05	0.25	0.07	0.25

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = 0.19 <sup>b</sup>Cutoff = 0.44



Figure 13. Influence Analysis of Regression of Child's Theory of Mind on Parent's Mindful Describing

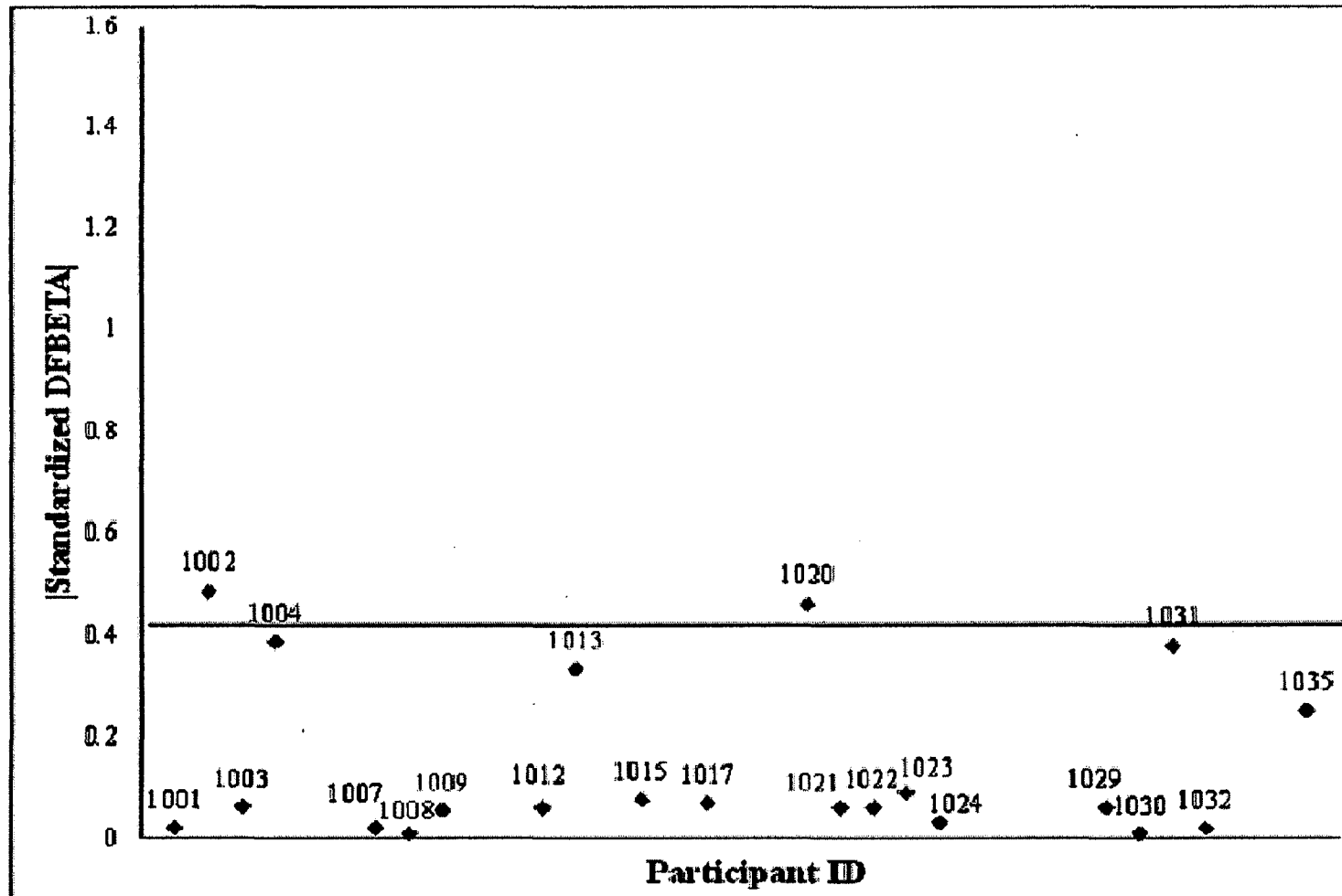


Figure 13. Case-wise measures of influence in linear regression of child's theory of mind development on parent's mindfulness factor of Describing (FFMQ). Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. FFMQ = Five Facet Mindfulness Questionnaire

Table 23 and Figure 14 present data on participant level effects for the linear regression of the child's theory of mind development on the mindfulness factor Acting with Awareness from the FFMQ. The Acting with Awareness factor accounts for a negligible amount of the variance in the child's theory of mind development,  $r^2 = 0.00$ ,  $b = 0.04$ , 95% CI for  $b$  [-0.40, 0.48]. Two participant-dyads showed evidence of having notable influence on this regression: participant 1013, Cook's  $D = 0.17$ , Standardized DFBETA = 0.49,  $b$  with case removed = 0.14; participant 1031, Cook's  $D = 0.27$ , Standardized DFBETA = 0.35,  $b$  with case removed = 0.10.

Table 23

*Influence Analysis of Regression of Child's Theory of Mind on Parent's Acting with Awareness*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.04	-0.01	0.03
1002	0.03	-0.19	-0.04	0.00
1003	0.00	-0.02	0.00	0.04
1004	0.07	-0.06	-0.01	0.03
1007	0.02	0.04	0.01	0.05
1008	0.00	0.02	0.00	0.04
1009	0.01	0.07	0.02	0.06
1012	0.00	0.05	0.01	0.05
1013	0.17	0.49**	0.10	0.14
1015	0.09	-0.36	-0.07	-0.03
1017	0.01	0.10	0.02	0.06
1020	0.12	-0.41	-0.09	-0.05
1021	0.02	-0.06	-0.01	0.03
1022	0.00	-0.03	-0.01	0.03
1023	0.01	0.10	0.02	0.06
1024	0.00	-0.01	0.00	0.04
1029	0.01	0.07	0.02	0.06
1030	0.03	-0.22	-0.05	-0.01
1031	0.27*	0.35	0.05	0.10
1032	0.00	0.03	0.01	0.05
1035	0.02	0.07	0.01	0.06

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = 0.19 <sup>b</sup>Cutoff = 0.44

Figure 14. Influence Analysis of Regression of Child's Theory of Mind on Parent's Acting with Awareness

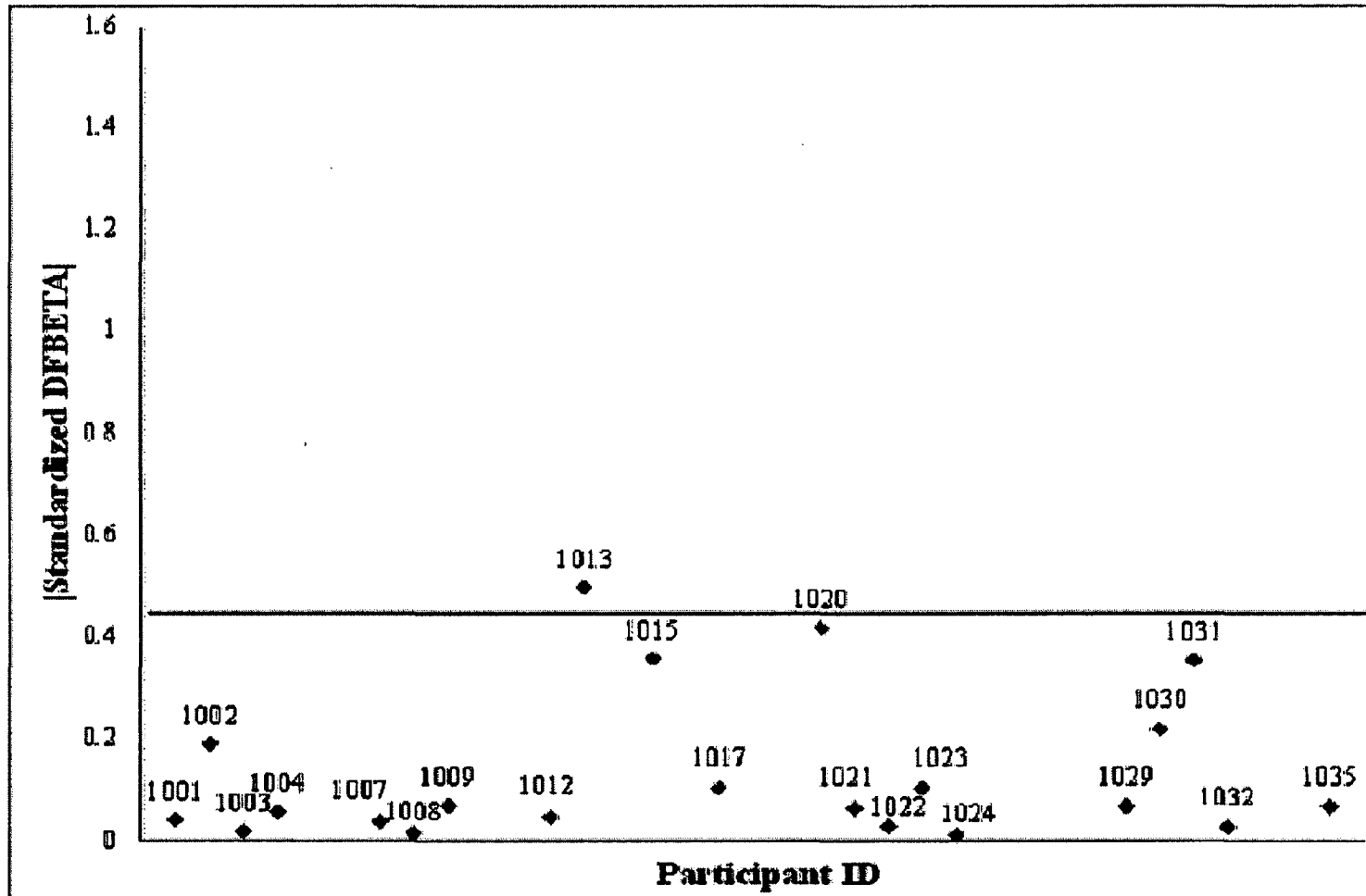


Figure 14. Case-wise measures of influence in linear regression of child's theory of mind development on parent's mindfulness factor of Acting With Awareness (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. FFMQ = Five Facet Mindfulness Questionnaire

Table 24 and Figure 15 present data on participant level effects for the linear regression of the child's theory of mind development on the mindfulness factor Non-judging of Inner Experience from the FFMQ. The Non-judging of Inner Experience factor accounts for 15% of the variance in the child's theory of mind development,  $r^2 = 0.15$ ,  $b = 0.45$ , 95% CI for  $b$  [-0.06, 0.95]. Three participant-dyads showed evidence of having notable influence on this regression: participant 1012, Cook's  $D = 0.63$ , Standardized DFBETA = -1.08,  $b$  with case removed = 0.19; participant 1020, Cook's  $D = 0.16$ , Standardized DFBETA = -0.46,  $b$  with case removed = 0.34; participant 1031, Cook's  $D = 0.57$ , Standardized DFBETA = 1.09,  $b$  with case removed = 0.65.

Table 24

*Influence Analysis of Regression of Child's Theory of Mind on Parent's Non-judging of Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	0.00	0.00	0.45
1002	0.01	0.01	0.00	0.45
1003	0.00	0.03	0.01	0.45
1004	0.13	0.42	0.10	0.55
1007	0.01	0.12	0.03	0.47
1008	0.00	0.00	0.00	0.45
1009	0.00	-0.01	0.00	0.44
1012	0.63*	-1.08**	-0.26	0.19
1013	0.06	-0.03	-0.01	0.44
1015	0.02	0.12	0.03	0.48
1017	0.00	0.05	0.01	0.46
1020	0.16	-0.46**	-0.11	0.34
1021	0.02	0.02	0.00	0.45
1022	0.00	-0.03	-0.01	0.44
1023	0.01	-0.02	0.00	0.44
1024	0.02	-0.12	-0.03	0.42
1029	0.01	-0.04	-0.01	0.44
1030	0.00	0.00	0.00	0.45
1031	0.57*	1.09**	0.20	0.65
1032	0.01	-0.10	-0.02	0.42
1035	0.04	-0.09	-0.02	0.42

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = 0.19 <sup>b</sup>Cutoff = 0.44

Figure 15. Influence Analysis of Regression of Child's Theory of Mind on Parent's Non-judging of Inner Experience

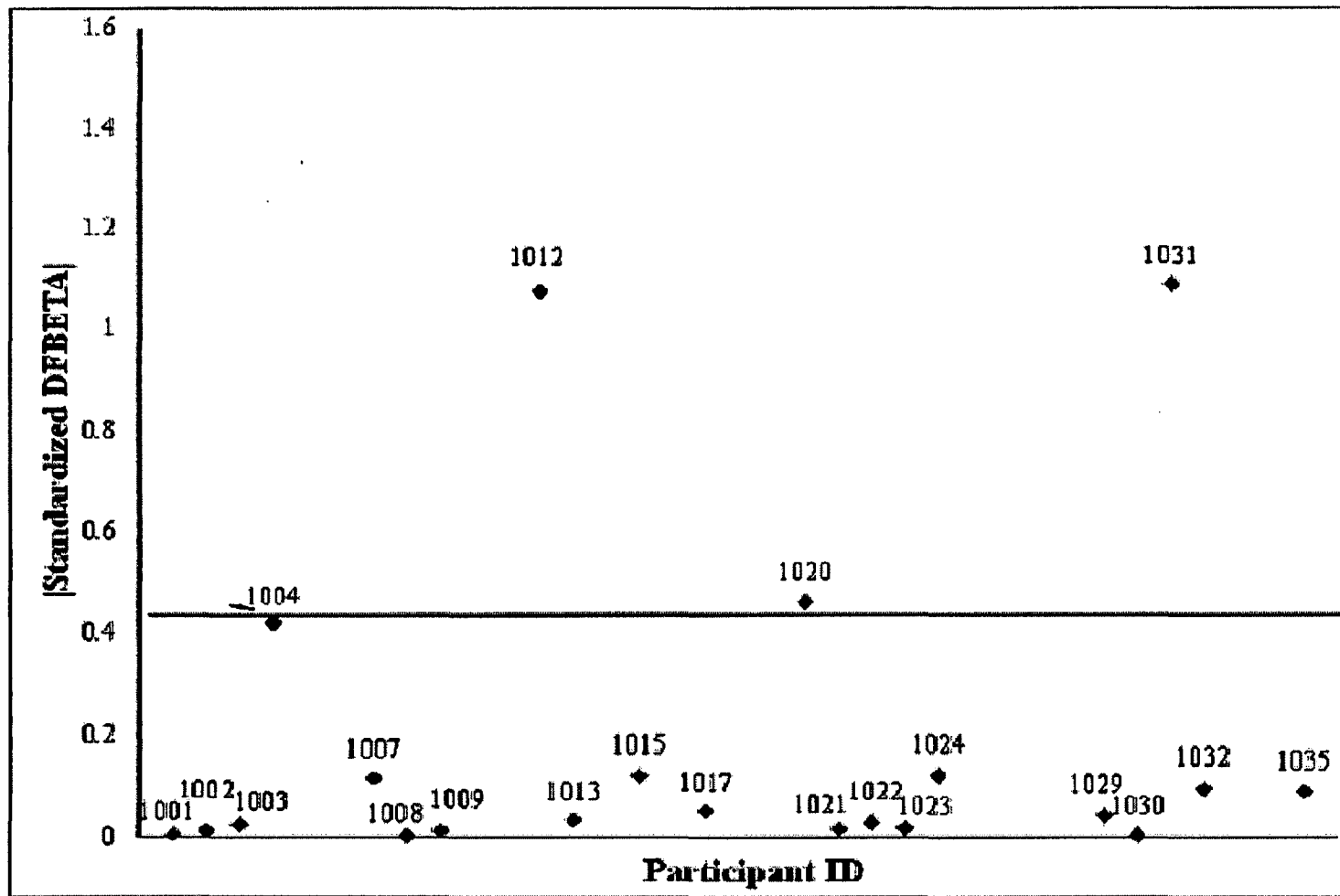


Figure 15. Case-wise measures of influence in linear regression of child's theory of mind development on parent's mindfulness factor of Non-judging of Inner Experience (FFMQ). Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. FFMQ = Five Facet Mindfulness Questionnaire

Table 25 and Figure 16 present data on participant level effects for the linear regression of the child's theory of mind development on the mindfulness factor Non-reactivity to Inner Experience from the FFMQ. The Non-reactivity to Inner Experience factor accounts for 1% of the variance in the child's theory of mind development,  $r^2 = 0.01$ ,  $b = 0.18$ , 95% CI for  $b$  [-0.54, 0.89]. One participant-dyad showed evidence of having notable influence on this regression: participant 1031, Cook's  $D = 0.29$ , Standardized DFBETA = 0.45,  $b$  with case removed = 0.29.



Table 25

*Influence Analysis of Regression of Child's Theory of Mind on Parent's Non-reactivity to Inner Experience*

Participant	Cook's D <sup>a</sup>	Standardized DFBETA <sup>b</sup>	DFBETA	<i>b</i> with Case Removed
1001	0.00	-0.01	0.00	0.17
1002	0.01	-0.07	-0.02	0.15
1003	0.00	-0.02	-0.01	0.17
1004	0.08	-0.14	-0.05	0.13
1007	0.03	0.19	0.06	0.24
1008	0.00	0.01	0.00	0.18
1009	0.00	0.06	0.02	0.20
1012	0.00	-0.03	-0.01	0.17
1013	0.10	0.33	0.11	0.29
1015	0.03	-0.04	-0.02	0.16
1017	0.01	-0.03	-0.01	0.17
1020	0.02	0.07	0.03	0.20
1021	0.03	-0.15	-0.05	0.13
1022	0.00	-0.01	0.00	0.17
1023	0.02	0.18	0.06	0.24
1024	0.00	-0.02	-0.01	0.17
1029	0.01	-0.09	-0.03	0.15
1030	0.02	-0.16	-0.06	0.12
1031	0.29*	0.45**	0.11	0.29
1032	0.00	-0.07	-0.03	0.15
1035	0.10	-0.37	-0.12	0.05

*Note.* \*Value greater than cutoff for Cook's D; \*\*Value greater than size-adjusted cutoff for Standardized DFBETA.

<sup>a</sup>Cutoff = 0.19 <sup>b</sup>Cutoff = 0.44

Figure 16. Influence Analysis of Regression of Child's Theory of Mind on Parent's Non-reactivity to Inner Experience

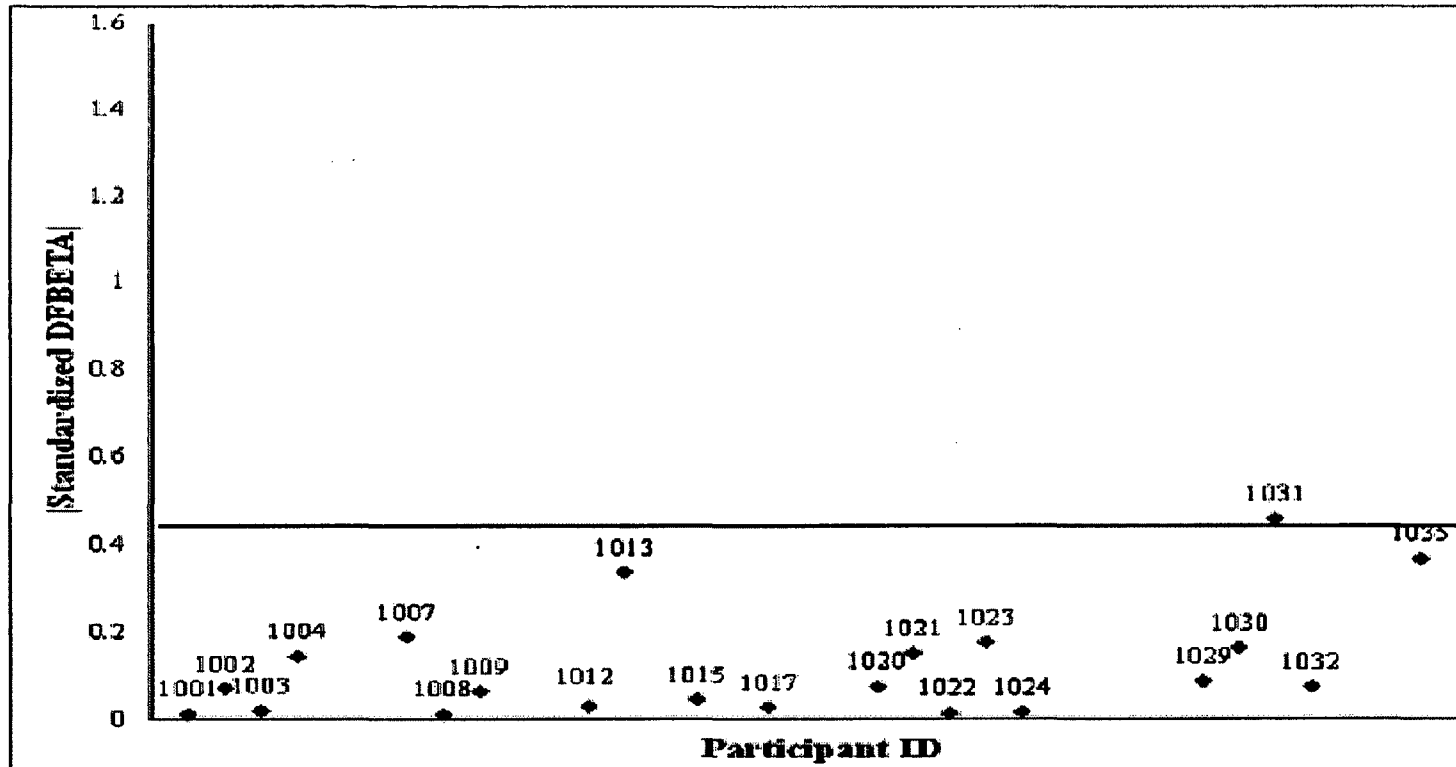


Figure 16. Case-wise measures of influence in linear regression of child's theory of mind development on parent's mindfulness factor of Non-reactivity to Inner Experience (FFMQ) . Straight line indicates the size-adjusted cutoff for Standardized DFBETA of 0.44. FFMQ = Five Facet Mindfulness Questionnaire

*Hypothesis 5. Parenting stress moderates the relationship between parental mindfulness and child's theory of mind development.*

To explore moderation, interaction terms were computed between parental total stress from the PSI and each mindfulness factor from the FFMQ. Interactions were then used to predict child's theory of mind in a series of linear single-predictor regressions. Table 26 presents data on each regression of child's theory of mind on the mindfulness-stress interaction. For each interaction-based regression,  $b = 0.00$ .

Table 26

*Model Summary for FFMQ Factors x Parent's Total Stress Interactions as Predicting Child's Theory of Mind*

Stress x Mindfulness Interaction	$r^2$	$b$	$SE_b$	$B$	$t$	$p$	95% CI for $b$	
							$LL$	$UL$
Observe	0.13	0.00	0.00	0.36	1.58	0.13	0.00	0.00
Describe	0.03	0.00	0.00	0.16	0.67	0.51	0.00	0.00
Acting With Awareness	0.02	0.00	0.00	0.15	0.61	0.55	0.00	0.00
Non-judging of Inner Experience	0.10	0.00	0.00	0.32	1.37	0.19	0.00	0.00
Non-reactivity to Inner Experience	0.05	0.00	0.00	0.22	0.95	0.36	0.00	0.00

*Note.* PSI = Parenting Stress Index (Total Stress); FFMQ = Five Factor Mindfulness Questionnaire; CI = confidence interval;  $LL$  = lower limit;  $UL$  = upper limit.

## CHAPTER V

### DISCUSSION

#### **Summary**

This is the first study to explore the relationship between the distinct facets of a mindfulness-oriented approach to one's experience and parent stress within a sample of parents with ASD children, as well as the theory of mind development of children with autism spectrum disorders. While limited in sample size, and thus statistical power, it nonetheless strongly suggests that certain factors associated with mindfulness, namely a person's ability to remain calm and non-reactive when faced with difficulty, relates (and possibly underlies) to a parent's ability to manage stress in the face of chronic difficulties of raising and supporting a child. In addition, a less developed ability to describe one's stress and affective state without judgment or evaluation appears to define those parents who endorsed higher levels of stress (and thus warranted a referral for support services) from those who do not. Two separate mindfulness capacities predict children's theory of mind development: parents' ability to observe their own thoughts, feelings, and actions with full attention, and to be non-judgmental of one's inner experience. Perhaps children on the autism spectrum (and possibly off) respond to and learn more effectively from parents who are attentive and non-judgmental, observing and commenting on their child's play and development. These conditions are similar to those thought to underlie secure attachment. Recent work supports the importance of a parent's state of mind and conceptualization of their childhood experience in relation to emotion and interpersonal functioning in children with ASD (Seskin, 2010).

The small sample size in this present investigation allowed for a fine-grained analysis of participant effects within the various regression models. While there were many participant data points that affected different analyses, it is important to note that each influential participant did not notably affect the direction of the overall relationship. The hypothesized directions of relationships were correct across all analyses, even with influential data points accounted for. These data provide compelling evidence that a parent's mindful experience or organization in life yields impressive benefits for themselves and their children with autism spectrum disorder.

### **Limitations of the Current Study**

This investigation was limited primarily by the small sample size, itself an artifact of difficulty recruiting parent-child dyads into the study. Further, within the present sample there was a lack of diagnostic homogeneity in the child participants. Of the those participants, the diagnoses present spanned the range of the autism spectrum, including Autistic Disorder, Asperger Disorder, and Pervasive Developmental Disorder, Not Otherwise Specified (American Psychiatric Association, 2000). Given the most recent information regarding the upcoming Diagnostic and Statistical Manual, 5<sup>th</sup> Edition, this may not be entirely problematic: current information indicates that all of the autism-related developmental disorders will be consolidated into an "Autism Spectrum Disorder" diagnosis (Dawson, 2012). Regardless, there was heterogeneity in the diagnostic process for the child participants. Without a clear and consistent diagnostic plan, we cannot be certain that all children were diagnosed using uniform rationale or assessment

instruments. Indeed, our data support this concern: using the SCQ, which has acceptable sensitivity and specificity as a screening tool, approximately half of child participants showed evidence of autism spectrum disorder, even though all children had previously received an autism spectrum diagnosis. Follow-up investigations would build upon the basic design of this study, but seek to enroll significantly more children and families, control for diagnosis within the autism disorder, and confirm the presence of autistic presentation through confirmatory assessment, using a standardized diagnostic instrument.

### **Implications for Future Research**

The data from this investigation are impressively strong given the many limitations to the sample and study design. Based on this work, a large-scale investigation of the mindfulness and stress characteristics of parents, especially those with autistic or special needs children, is indicated. Such a study would expand upon this pilot and provide an evidence base from which rigorous, robust, and empirically supported interventions that have a mindfulness foundation and are tailored to parents of special needs children can be developed. Recent scholarship confirmed the findings in this study regarding the relationship between mindfulness and parent stress for parents of children with ASD (Beer, Ward, & Moar, 2013). In addition, early data indicates that parent mindfulness training for parents of children with ASD produced moderate to large treatment benefits in support of lower stress and greater global health (Ferraioli & Harris, 2013).

Perhaps meditation experience is important. With previously non-meditating samples, it is unclear in the non-clinical literature whether the effects of mindfulness training are durable; longitudinal analysis of mindfulness training effectiveness would be most helpful. Further, longitudinal tracking would provide insight into how parenting stress (and its management through mindfulness techniques) changes over development.

A further line of inquiry that is related to the present research concerns if and how mindfulness training can be helpful and adaptive to children with ASD. To date, no significant scholarly research exists that examines mindfulness-based neurocognitive and theory of mind interventions for ASD populations; a recent literature search by the author found data from other Axis I diagnoses (e.g., depression & anxiety), intellectual disabilities, and neurotypical children.

As noted in this study, mindfulness capacities help not only parents to manage or modulate their stress, but also children to development the core skill of theory of mind. This finding requires confirmation from a more robust and clearly defined sample of parent-child dyads. Further, the mechanism of action remains unclear, but could be clarified with a systematic exploration of or training in the different features of mindfulness.

The present study also lays a foundation for a training study. To date, three published investigations have explored if and how parents with autistic children benefit from mindfulness training. Bird (2012) conducted a randomized controlled trial of a mindfulness-based intervention for parents of children with autism. Based on the provision of a 4-hour Acceptance and Commitment Therapy workshop over two weeks



for parents of children with ASD, Bird reported no significant effect of the workshop on parent stress, depression, or anxiety. This finding is not surprising, given that mindfulness as a core capacity and approach to experience is built on daily practice and repetition over a longer time than two weeks. Benn, Akiva, Arel, and Roeser (2012) presented data on a fully manualized instructional mindfulness curriculum as applied to parents and educators of special needs children. Mindfulness training increased reported mindfulness and well-being and decreased stress. However, less than half of parents in this study (12 of 28) had children on the autism spectrum. Lastly, Ferraioli and Harris (2013) provided 15 parents of children with ASD 8-week trainings on either mindfulness (n=6) or behavioral parenting (n=9) skills. Mindfulness was measured using one of the assessments that was included in the factor analysis that produced the FFMQ, and parent stress was indexed with the short form of the PSI. At the end of 8 weeks and a 3-month follow-up, parents who received mindfulness training showed greater diminishment of parenting stress and greater increase in ratings of global health than parents who completed behavior skills training.

### **Implications for School-Child Clinical Psychology**

Findings from this study have immediate school & clinical psychology relevance for educators and mental health practitioners. Mindfulness techniques are immediately available to interested parties and require no particular audio recordings, tools, or special equipment (Kabat-Zinn, 2005). The skills needed have been developed into readily available workbooks and free resources available on the Internet should someone want

further information (McKay, Wood, & Brantley 2007; Stahl & Goldstein, 2010; Roberts, 2009). Within the empirical psychological as well as Buddhist spiritual literature, mindfulness practices are available and applicable to all persons at every stage of life. Mental health practitioners can thus integrate these practices either formally in their work with patients and families, or informally (Siegel, 2010; Epstein, 2007; Germer, Siegel, & Fulton, 2005; Shapiro & Carlson, 2009). Further, the skills and theoretical underpinnings of mindfulness and its relation to stress can be shared in large settings such as PTA meetings and parent conferences.

Ample data exists in support of mindfulness training for educators in general education and special education settings (Albrecht, Albrecht, & Cohen, 2012; Benn, Akiva, Arel, Roeser, & Eccles, 2012; ). However, no studies to date have examined what facets of mindfulness are most helpful or productive for managing teacher stress, supporting positive teacher-student communication, and fostering a more mindful classroom. The present study provides data suggesting that certain facets are more predictive of stress resilience or stress management than others; it would be useful to assess whether educators, administrators, and mental health clinicians show a similar pattern of differential facet functioning. Regardless, this study amplifies the literature that the chronically stressed teacher, similar to the chronically stressed parent of a child with ASD, would benefit from a more mindful approach to teaching and living.

## Conclusion

Stress is omnipresent and unavoidable. For parents with autistic or special needs children, stress is both more acute and chronic. The effects of parenting stress have been shown to cascade through to their children, but this study, in concert with the mindfulness psychotherapy and meditation literature before it, provides a foundation for developing effective, accessible tools and techniques for parents of children with ASD. Facets of mindfulness, including the ability to describe one's emotional or sensory experience, notice the happenings of the mind without judgment, and experience challenges without reacting heedlessly to them, relate to lower levels of stress in parents with ASD children. This pattern holds for children with varying severity of ASD. Further, a parent's mindful approach to experience is positively related to their autistic child's theory of mind development. Thus, a mindful approach to experience supports development of one of the core deficits of the autism spectrum disorders. Given that mindfulness-based exercises and practices are an accessible avenue of intervention that requires nothing more than time and attention, and that the evidence strongly suggests that increased mindfulness has beneficial effects for parents and ASD children, future investigation is indicated to confirm and extend these findings. Life is stressful, but how parents (and all people) relate to stress, and to other people, is mutable; the effects are powerful, long-lasting, and effective across generations.

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## APPENDICES

### A. ASD Cover Letter & Consent

#### PACE UNIVERSITY RESEARCH PROJECT

Dear Parent,

As Doctor of Psychology Candidates at Pace University, we will be conducting our dissertation research under the supervision of our Pace University Dissertation Advisors K. Mark Sossin, Ph.D. and Alfred Ward, Ph.D. The purpose of this research study is to gain a better understanding of the deficits often found in children with Autism Spectrum Disorders. We will also be investigating parenting stress, reflectivity, and mindfulness and how these concepts may relate to the development of “theory of mind” skills in children with Autism Spectrum Disorders.

Your participation in this study will make a meaningful contribution to the research examining the relationship between parental input and child development and can prove useful as information to disseminate to parents of children with Autism Spectrum Disorders. In addition, you will be providing critical information that may contribute to the further development of therapeutic and school-based interventions for children with Autism Spectrum Disorders and their families that is aimed at augmenting perspective-taking, mentalization-skills, emotion-sharing, and other relational-functioning skills. Your participation is vital to our work, and we invite all parents to join us in this groundbreaking research.

By agreeing to participate in this study, you will be asked to participate in an interview that will ask you to reflect upon your own parental relationships in addition to your reaction to your child’s diagnosis. Some of the questions asked in this interview may cause you to become uncomfortable or upset when reflecting upon past experiences. If you become distressed at any point during interview, the researcher will end the interview and professional referral information will be made available to you. In addition to the interview, you will be asked to complete four questionnaires. In total this is estimated to take 2 hours to complete. In addition, after your child assents to participate, they will be asked to complete a series of story-like tasks requiring them to answer questions about the stories told. This will be administered by either Alessandra or one of the additional investigators, and is expected to take about 30 minutes to complete. All materials collected for this research will remain confidential. To ensure your privacy, a number will be the only identifying information on any data collected.

If you are willing to volunteer for this groundbreaking research, please sign the Research Participant Consent Form. An appointment will be scheduled for you to meet with one of us at your earliest convenience.

We hope you will agree to participate in this meaningful research and look forward to working with you.

Sincerely,

Alessandra Twomey, M.S.Ed., M.A.

Logan Hegg

Jenna Rosen

Doctor of Psychology Candidates, Pace University



## **B. ASD Informed Consent Form**

### **Informed Consent Form**

This study will be conducted by Alessandra Twomey, M.S.Ed., M.A., with collaborators Logan Hegg and Jenna Rosen from the Department of Psychology of Pace University, New York, NY. The purpose of this research study is to gain a better understanding of the deficits often found in children with Autism Spectrum Disorders. In addition, we will be investigating parenting stress, reflectivity, and mindfulness. We will also be collecting information regarding parents' reactions to their child's diagnosis. By agreeing to participate in this study, you will be asked to participate in an interview that will ask you to reflect upon your own parental relationships in addition to your reaction to your child's diagnosis. Some of the questions asked in this interview may cause you to become uncomfortable or upset when reflecting upon past experiences. If you become distressed at any point during interview, the researcher will end the interview and professional referral information will be made available to you. In addition to the interview, you will be asked to complete four questionnaires. In total this is estimated to take 2 hours to complete. In addition, after your child assents to participate, they will be asked to complete a series of story-like tasks requiring them to answer questions about the stories told. This will be administered by either Alessandra or one of the additional investigators, and is expected to take about a half an hour to complete.

Your participation in this study is of a voluntary nature. Therefore, at any point during the study you feel uncomfortable to continue, you have the right to withdraw your participation without penalty. There are no foreseeable physical or psychological risks involved in this study. You can benefit from this study by being able to experience and learn about the process involved in psychological research. You may consult with family members or other advisors before making a decision with regard to participating in this research. You may also show your consultants this form for reference, as you are provided with a copy for your personal records. There are no direct benefits to participating in this study. However, information garnered from this study may be useful to inform familial, therapeutic, and educational interventions with children with Autism Spectrum Disorders. While there will be no remuneration for all participants, each participating parent-child pair will be entered into a raffle to win a \$100 Amazon.com gift card. The raffle drawing will occur following completion by all participants and the winner will be notified at time of drawing. Gift certificates will be mailed out immediately following the drawing.

All provided information and data collected will not be shared or made available to anyone outside of the research team. All personal information will be removed upon completion of materials, and code numbers will be assigned and used for reference. Aside from basic demographic information, you will not be asked to provide any other identifying information. No personal information will be presented or disclosed publicly and all information gathered from this study will be analyzed in a collective manner.

Original data will be kept in a locked file-space at the Department of Psychology at Pace University. After 10 years, all original data will be appropriately destroyed.

The Institutional Review Board (IRB) at Pace University has approved the solicitation of subjects for this study. If you have any questions or concerns, please contact the Office of Sponsored Research at 212-346-1273. Rebecca School has also approved of the solicitation of subjects for this study. The Department of Psychology supports the practice of protection for human participants involved in research and related activities. If you have any questions or concerns regarding this study, please feel free to contact Dr. Mark Sossin, Advisor to this study ([ksossin@pace.edu](mailto:ksossin@pace.edu)), Mrs. Twomey ([alessandra.twomey@gmail.com](mailto:alessandra.twomey@gmail.com)), Ms. Rosen ([jennabrosen@gmail.com](mailto:jennabrosen@gmail.com)), or Mr. Hegg ([Logan.hegg@gmail.com](mailto:Logan.hegg@gmail.com)).

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I voluntarily consent to participate in this research regarding the deficits often found in children with Autism Spectrum Disorders, I understand the information provided above and I understand that I can withdraw from the study at any time without penalty. All questions have been answered to the best of the investigator's ability and I understand that I can contact the investigator with additional questions regarding the study in the future.

Participant's Name: \_\_\_\_\_

Participant's Signature: \_\_\_\_\_

Date:

**C. Non-ASD Cover Letter****PACE UNIVERSITY RESEARCH PROJECT**

Dear Parent,

As Doctor of Psychology Candidates at Pace University, we will be conducting our dissertation research under the supervision of our Pace University Dissertation Advisors K. Mark Sossin, Ph.D. and Alfred Ward, Ph.D. The purpose of this research study is to gain a better understanding of how children develop the ability to mentalize. We will also be investigating parenting stress, reflectivity, and mindfulness and how these concepts may relate to the development of “theory of mind” skills in children.

Your participation in this study will make a meaningful contribution to the research examining the relationship between parental input and child development and can prove useful as information to disseminate to parents with regards to child development. In addition you will be providing critical information that may contribute to the further development of therapeutic and school-based interventions for children and their families that is aimed at augmenting perspective-taking, mentalization-skills, emotion-sharing, and other relational-functioning skills. Your participation is vital to our work, and we invite all parents to join us in this groundbreaking research.

By agreeing to participate in this study, you will be asked to participate in an interview that will ask you to reflect upon your own parental relationships in addition to your reaction to your child’s diagnosis. Some of the questions asked in this interview may cause you to become uncomfortable or upset when reflecting upon past experiences. If you become distressed at any point during interview, the researcher will end the interview and professional referral information will be made available to you. In addition to the interview, you will be asked to complete four questionnaires. In total this is estimated to take 2 hours to complete. In addition, after your child assents to participate, they will be asked to complete a series of story-like tasks requiring them to answer questions about the stories told. This will be administered by either Alessandra or one of the additional investigators, and is expected to take about 30 minutes to complete. All materials collected for this research will remain confidential. To ensure your privacy, a number will be the only identifying information on any data collected.

If you are willing to volunteer for this groundbreaking research, please sign the Research Participant Consent Form. An appointment will be scheduled for you to meet with one of us at your earliest convenience.

We hope you will agree to participate in this meaningful research and look forward to working with you.

Sincerely,

Alessandra Twomey, M.S.Ed., M.A.  
Logan Hegg  
Jenna Rosen  
Doctor of Psychology Candidates, Pace University

## **D. Non-ASD Consent Form**

### **Informed Consent Form**

This study will be conducted by Alessandra Twomey, M.S.Ed., M.A., with collaborators Logan Hegg and Jenna Rosen from the Department of Psychology of Pace University, New York, NY. The purpose of this research study is to gain a better understanding of how children develop the ability to mentalize. In addition, we will be investigating parenting stress, reflectivity and mindfulness. We will also be collecting information regarding parents' reactions to their child's diagnosis. By agreeing to participate in this study, you will be asked to participate in an interview that will ask you to reflect upon your own parental relationships. Some of the questions asked in this interview may cause you to become uncomfortable or upset when reflecting upon past experiences. If you become distressed at any point during interview, the researcher will end the interview and professional referral information will be made available to you. In addition to the interview, you will be asked to complete four questionnaires. In total this is estimated to take 2 hours to complete. In addition, after your child assents to participate, they will be asked to complete a series of story-like tasks requiring them to answer questions about the stories told. This will be administered by either Alessandra or one of the additional investigators, and is expected to take about a half an hour to complete.

Your participation in this study is of a voluntary nature. Therefore, at any point during the study you feel uncomfortable to continue, you have the right to withdraw your participation without penalty. There are no foreseeable physical or psychological risks involved in this study. You can benefit from this study by being able to experience and learn about the process involved in psychological research. You may consult with family members or other advisors before making a decision with regard to participating in this research. You may also show your consultants this form for reference, as you are provided with a copy for your personal records. There are no direct benefits to participating in this study. However, information garnered from this study may be useful to inform familial, therapeutic, and educational interventions aimed to enhance development of mentalization abilities. While there will be no remuneration for all participants, each participating parent-child pair will be entered into a raffle to win a \$100 Amazon.com gift card. The raffle drawing will occur following completion by all participants and the winner will be notified at time of drawing. Gift certificates will be mailed out immediately following the drawing.

All provided information and data collected will not be shared or made available to anyone outside of the research team. All personal information will be removed upon completion of materials, and code numbers will be assigned and used for reference. Aside from basic demographic information, you will not be asked to provide any other identifying information. No personal information will be presented or disclosed publicly and all information gathered from this study will be analyzed in a collective manner.

Original data will be kept in a locked file-space at the Department of Psychology at Pace University. After 10 years, all original data will be appropriately destroyed.

The Institutional Review Board (IRB) at Pace University has approved the solicitation of subjects for this study. If you have any questions or concerns, please contact the Office of Sponsored Research at 212-346-1273. The Department of Psychology supports the practice of protection for human participants involved in research and related activities. If you have any questions or concerns regarding this study, please feel free to contact Dr. Mark Sossin, Advisor to this study ([ksossin@pace.edu](mailto:ksossin@pace.edu)), Mrs. Twomey ([alessandra.twomey@gmail.com](mailto:alessandra.twomey@gmail.com)), Ms. Rosen ([jennabrosen@gmail.com](mailto:jennabrosen@gmail.com)), or Mr. Hegg ([Logan.hegg@gmail.com](mailto:Logan.hegg@gmail.com)).

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I voluntarily consent to participate in this research regarding the development of mentalization in children. I understand the information provided above and I understand that I can withdraw from the study at any time without penalty. All questions have been answered to the best of the investigator's ability and I understand that I can contact the investigator with additional questions regarding the study in the future.

Participant's Name: \_\_\_\_\_

Participant's Signature: \_\_\_\_\_

Date:

\_\_\_\_\_

**E. Contact Information Form****CONTACT INFORMATION**

NAME: \_\_\_\_\_

TELEPHONE NUMBER: \_\_\_\_\_

**IN ORDER TO EXPEDITE THE PROCESS WE CAN SEND YOU THE SELF-REPORT MEASURES VIA MAIL OR EMAIL**Check here if you would like them sent via email: ☐ Yes ☐ No

Email Address: \_\_\_\_\_

Check here if you would like them sent via regular mail: ☐ Yes ☐ No

Preferred Mailing Address: \_\_\_\_\_

\_\_\_\_\_

**F. Demographic Form****COVER SHEET**

To be filled out by participating parent/guardian.

Subject # \_\_\_\_\_

**Date of Birth (Self)** \_\_\_\_ / \_\_\_\_ / \_\_\_\_ **Age** \_\_\_\_\_

**Date of Birth (Child)** \_\_\_\_ / \_\_\_\_ / \_\_\_\_ **Age** \_\_\_\_\_

**Ethnicity (Self)** Check one:

- African American
- Asian
- Caucasian
- Hispanic
- Native American
- Multicultural
- Other. If other, specify ethnicity \_\_\_\_\_

**Ethnicity (Child)** Check one:

- African American
- Asian
- Caucasian
- Hispanic
- Native American
- Multicultural
- Other. If other, specify ethnicity \_\_\_\_\_

**Gender (Self)** ☐ Male ☐ Female ☐ Transgendered

**Gender (Child)** ☐ Male ☐ Female ☐ Transgendered



**Is the child participating in this study your biological child?**

☐ Yes ☐

No

Please indicate: Full biological

☐ Yes ☐

No

Maternal biological

☐ Yes ☐

No

Paternal biological

☐ Yes ☐

No

Other \_\_\_\_\_

**Was the pregnancy full-term?**

☐ Yes ☐

No

If no, please indicate gestational age of child when born \_\_\_\_\_

**Are you the primary caregiver?**

☐ Yes ☐

No

If no, please indicate who the primary caregiver is \_\_\_\_\_

**Are both parents together and in the home?**

☐ Yes ☐

No

**Are parents separated/divorced?**

☐ Yes ☐

No

If yes, when did separation occur \_\_\_\_\_ (year)

If yes, does child regularly spend time with both parents

☐ Yes

☐ No

**Is English the primary language spoken among adults in the home?**

☐ Yes

☐ No

If not, what is the primary language spoken? \_\_\_\_\_

**Please list other languages which are spoken in the home at least 1/3 of the time**

\_\_\_\_\_

**Does your child have any siblings?**

☐ Yes

☐ No

If so, how

many? \_\_\_\_\_

If so, do any of your child's siblings have special needs?

☐ Yes

☐ No

**What grade is your child in?** \_\_\_\_\_

**What type of class is your child in?**

- Regular education class without extra support
- Regular education class with extra support
- Special needs class

**Has your child ever been diagnosed with an Autism Spectrum Disorder (ASD)?** ☐Yes ☐ No

If so, please indicate which diagnosis your child has been given:

- Autistic Disorder
- Rett Disorder
- Childhood Disintegrative Disorder
- Asperger's Disorder
- Pervasive Developmental Disorder NOS

**Intervention Modality: If your child has an ASD, has the primary intervention been:**

- ABA (Applied Behavior Analysis)
- DIR (Developmental, Individual-Difference, Relationship-Based)
- RDI (Relationship Development Intervention)
- TEACCH (Treatment and Education of Autistic and Communication Related Handicapped Children )
- Medication
- Non-medication biologically-based intervention
- Other \_\_\_\_\_

**Please indicate if your child has been diagnosed with any of the following psychiatric diagnoses:**

- Attention Deficit Hyperactivity Disorder
  - Depressive Disorder
  - Bipolar Disorder
  - Conduct Disorder
  - Oppositional Defiant Disorder
  
  - Anxiety Disorder
  - Obsessive Compulsive Disorder
  - Post-Traumatic Stress Disorder
  - Other diagnosis
- 

**In addition, does your child suffer from:**

- Sensory processing disorder (or “sensory integration disorder)
  - Attachment disorder
  - Regulatory Disorder
  - Other
- 
-

**Has your child ever been diagnosed with a learning disability?**

☐ Yes ☐

No

If so, please indicate which specific learning disability:

- Reading Disorder
  - Mathematics Disorder
  - Disorder of Written Expression
  - Learning Disorder NOS
  - Dyslexia
  - Dyscalculia
  - Dysgraphia
  - Auditory Processing Disorder
  - Visual Processing Disorder
  - Other
- 
- 

**Please indicate if your child has a history of the following medical conditions:**

- Head injury
- Seizures/Epilepsy
- Encephalitis
- Meningitis
- Ear infections
- Vision problems
  
- Hearing loss
- High fevers
- Stroke
- Other (please indicate) \_\_\_\_\_

### **Medication**

**Please indicate if your child is taking prescribed medications for the following reasons and for how long:**

<u><b>Additional Supplements</b></u>	<u><b>Name of Medication</b></u>	<u><b>Duration</b></u>
--------------------------------------	----------------------------------	------------------------

- To control mood \_\_\_\_\_
- To control thoughts \_\_\_\_\_
- To control behavior \_\_\_\_\_
- To control attention \_\_\_\_\_
- To control anxiety \_\_\_\_\_

### **PARENT QUESTIONS**

#### **Your Highest Level of education**

- Grade school ☐
- Some HS ☐
- Graduated HS ☐
- Trade school ☐
- Some college ☐
- AA ☐
- BS/BA ☐
- Some grad school ☐
- MS/MA ☐
- JD ☐
- PhD ☐
- MD ☐

Other (If other, explain: \_\_\_\_\_)

**Occupation**

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Currently, I am employed: ☐ Full Time ☐ Part Time ☐ Not employed

**Do you currently have a consistent meditation practice?** ☐ Yes ☐ No

**Have you ever had a consistent meditation practice?** ☐ Yes ☐ No

**If so, for how long had/have you had a consistent meditation practice?**

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**Annual Household Income**

- Less than \$15,000
- \$15,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$199,999
- \$200,000 or more

### G. Theory of Mind Battery Instructions

#### **THEORY OF MIND BATTERY (Adapted from Joseph & Tager-Flusberg, 2004)**

Four tasks: Total of 15 questions- Final points = 22.

**Discontinue criterion:** Participants who score at least 2 points on the first task will also be administered the second task. Participants who receive a score of 2 or less on any subsequent tasks will not be administered the following tasks.

**TASK #1****PERCEPTION – KNOWLEDGE TASK**

Experimenter introduces the task by saying, ***“I am going to tell you some stories about a boy and a girl. Listen carefully so you can answer the question at the end.”***

Provide model for all questions. Follow the order provided. Only score for test questions.

**\*\*** For questions including the use of the box- hide paperclip in box. Leave box open (with top up) during trials. When demonstrating “push”, make sure to push box from behind so that doll cannot see into the box.

**\*\***For control questions, end in “non-neutral position” (For example, girl should be holding the radio when examiner asks “Does the boy have the radio?”)

**\*\***For test questions, end in “neutral position” (For example, boy and girl should be standing on either side of box facing examinee when examiner asks “Did the girl see what is in the box?”)



**TASK #1 QUESTIONS**Control #1

This boy **walks by** the radio. This girl **picks up** the radio. Does the boy **have** the radio?

(No.)

\*\* If correct, say ***“Right. The boy does not have the radio.”***

If incorrect, say ***“Look. (remodel the story) The girl has the radio. The boy does not have the radio”***

Test #1

***Okay, here’s another story. There is something in this box. (Shake box.) Now listen to the story.*** This boy **pushes** the box. This girl **looks in** the box.

Did the girl **see** what is in the box? (Yes.)

Control #2

***Okay, here’s another story.*** This boy **throws** the frisbee. This girl **walks by** the frisbee.

Did the boy **touch** the frisbee? (Yes.)

\*\* If correct, say ***“Right. The boy touched the frisbee.”***

If incorrect, say ***“Look. (remodel the story) The boy touched the frisbee. The girl did not touch the frisbee”***

Test #2

*“Okay, here’s another story. There is something in this box. (Shake box.) Now listen to the story.* This girl **pushes** the box. This boy **looks in** the box.

Does the girl **know** what is in the box? (No.)

Control #3

*“Okay, here’s another story.* This boy **throws** the ball. This girl **walks by** the ball.

Did the girl **touch** the ball? (No.)

Test #3

*“Okay, here’s another story. There is something in this box. (Shake box.) Now listen to the story.* This boy **looks in** the box. This girl **pushes** the box.

Does the boy **know** what is in the box? (Yes.)

Control #4

*Okay, here’s another story.* This boy **walks by** the cat This girl **picks up** the cat.

Does the girl **have** the cat? (Yes.)

Test #4

*Okay, here’s another story. There is something in this box. (Shake box.) Now listen to the story.* This girl **looks in** the box. This boy **pushes** the box.

Did the boy **see** what is in the box? (No.)

**TASK #2****STANDARD LOCATION CHANGE FALSE BELIEF TASK**

**\*\*Back up story to be used ONLY when breach of method (e.g. interruption, distraction, examiner makes mistake in administration)**

**STORY #1: APPLES**

Items needed: Range, refrigerator, apple basket, table, one chair, girl doll, mom doll

*"This is a story about a girl named Maggie and her mom. This is Maggie, and this is her mom, and this is the kitchen of their house. Maggie and her mom have just picked some apples, and they're getting ready to put them away.*

*So, Maggie and Mom put the apple basket onto the table.*

*"Okay," says Maggie, "I'm going outside to play now, but when I come back, I'm going to eat one of those apples."*

*So, Maggie goes outside to play.*

*Then, Mom says to herself, "Hmm...I better take the apple basket off the table and put it in refrigerator. So, Mom takes the apple basket off the table and puts it in the refrigerator."*

**Control 1:**

*Where did Mom and Maggie put the apple basket **before** Maggie went out to play?  
[Remember, before Maggie went out to play, Maggie and Mom put the apple basket on the table.]*

**Control 2:**

*Where is the apple basket **now**?  
[Remember, Mom put the apple basket in the refrigerator].*

***Then, Maggie comes back for an apple. But she hasn't gone inside yet.***

**TEST QUESTIONS:**

**Test IG:** Does Maggie know where the apple basket is?

**Test FB:** Where will Maggie look **first** for the apple basket?

**Why:** And why will Maggie look there?

**STORY #2: BOOK**

Items needed: Couch, coffee table, dresser, book, boy doll, girl doll)

*This is a story about two friends named Sean and Anne. This is Sean, this is Anne, and this is the living room. They have just finished looking at a picture book and they are getting ready to put it away.*

*So, Anne and Sean put the picture book under the sofa.*

*“Okay,” says Anne, “I’m going outside now, but when I come back, let’s look at the picture book some more.”*

*So, Anne goes outside.*

*Then, Sean says to himself, “Hmm...I better take the picture book from under the sofa and put it in the drawer.” So, Sean takes the picture book from under the sofa and puts it in the drawer.*

**Control 1:** *Where did Anne and Sean put the picture book **before** Anne went out to play? [Remember, before Anne went outside, Anne and Sean put the picture book under the sofa]*

**Control 2:** *Where is the picture book **now**? [Remember, Sean put the picture book into the drawer.]*

Then Anne comes back to look at the picture book again. But she hasn’t gone inside yet.

**Test IG:** *Does Anne know where the picture book is?*

**Test FB:** *Where will Anne look **first** for the picture book?*

**Why:** *And why will Anne look there?*

**BACKUP STORY (Use in case of breach of method):****COOKIE**

Items needed: Range, refrigerator, table, one chair, cookie jar, cookies, girl doll,  
dad doll

*This is a story about a girl named Lisa and her dad. This is Lisa, and this is her dad, and this is the kitchen of their house. Lisa and her dad have just made some chocolate chip cookies, and they're getting ready to put them away.*

*So, Lisa and Dad put the cookies in the refrigerator.*

*"Okay," says Lisa, "I'm going outside to play now, but when I come back, I'm going to eat one of those cookies."*

*So, Lisa goes outside to play.*

*Then, Dad says to himself, "Hmm...I better take the cookies out of the refrigerator and put them in the jar." So, Dad takes the cookies out of the refrigerator and puts them in the jar.*

**Control 1:** *Where did Dad and Lisa put the cookies **before** Lisa went out to play? [Remember, before Lisa went out to play, Lisa and Dad put the cookies in the refrigerator.]*

**Control 2:** *Where are the cookies **now**? [Remember, Dad put the cookies in the jar.]*

Then, Lisa comes back to have a cookie. But she hasn't gone inside yet.

**Test IG:** *Does Lisa know where the cookies are?*

**Test FB:** *Where will Lisa look **first** for the cookies?*

**Why:** *And why will Lisa look there?*

**TASK #3****FALSE BELIEF 'SMARTIES'/OBJECT CHANGE TASK****Milk/battery**

*Look what I've got. What do you say is in here? So you say there is \_\_\_\_ in here. Let's look and see.*

*Oh my goodness, there is a battery in there. You said there was \_\_\_\_ in there, but there really is a battery. Ok, let's put the battery back in the box and close it up.*

**REALITY:** *Now, what's really in this box?*

correct: That's right, there really is a battery in the box.

incorrect: But remember, there really is a battery in the box.

**TEST QUESTIONS**

**1. RC:** *Now, when you first saw this box all closed up, what did you say was inside?*

If the child doesn't respond: *Did you say there was \_\_\_\_ or did you say there was a battery?*

**2. IG:** *Now, if I show this box, all closed up to \_\_ (mom/dad- whoever participating parent is)\_\_\_\_, will she know what's inside?*

**3. FB** *When she first looks at the box, what will she say is inside?*

### **Crayons/paper clips**

Look what I've got. What do you say is in here? So you say there are \_\_\_\_ in here. Let's look and see.

Oh my goodness, there are paper clips in there. You said there were \_\_\_\_ in there, but there are really paper clips. Ok, let's put the paper clips back in the box and close it up.

**REALITY:** *Now, what's really in this box?*

correct: That's right, there are really paper clips in the box.

incorrect: But remember, there are really paper clips in the box.

### **TEST QUESTIONS**

**1. REPRESENTATIONAL CHANGE/SELF:** *Now, when you first saw this box all closed up, what did you say was inside?*

If the child doesn't respond: *Did you say there were \_\_\_\_ inside or did you say there were paper clips?*

**2. IG:** *Now, if I show this box, all closed up to \_\_ (mom/dad- whoever participating parent is) \_\_\_\_, will she know what's inside?*

**3. FB** *When she first looks at the box, what will she say is inside?*

**Back up: Band-aid/Car**

Look what I've got. What do you say is in here? So you say there are \_\_\_\_\_ in here. Let's look and see.

Oh my goodness, there is a car in there. You said there were \_\_\_\_\_ in there, but there really is a car. Ok, let's put the car back in the box and close it up.

**REALITY:** *Now, what's really in this box?*

correct: That's right, there really is a car in the box.

incorrect: But remember, there really is a car in the box.

**TEST QUESTIONS**

**1. REPRESENTATIONAL CHANGE/SELF:** *Now, when you first saw this box all closed up, what did you say was inside?*

If the child doesn't respond: *Did you say there were \_\_\_\_\_ inside or did you say there was really a car?*

**2. IG:** *Now, if I show this box, all closed up to \_\_ (mom/dad- whoever participating parent is) \_\_\_\_\_, will she know what's inside?*

**3. FB** *When she first looks at the box, what will she say is inside?*



**TASK#4****SECOND ORDER BELIEF****Story #1: MOTHERS' DAY/BREAKFAST**

1. *This is a story about Ted and his mom.  
Today is Mothers' day. For Mom's big present, Ted is surprising her with breakfast in bed.  
See? Here's Ted making the Mothers' Day breakfast.*

2. *Ted and Mom are in the bedroom talking about Mothers' Day.  
Mom says, "Ted, I really want breakfast in bed this year."*

*Now remember, Ted wants the breakfast to be a big surprise, so he says, "Sorry, Mom. I'm not making that. I made you a really great card instead."*

**First order: What does Mom think Ted made her for Mothers' Day?**

**Reality: What did Ted REALLY make her for Mothers' day?**

*(if incorrect: But remember, Ted wants to surprise her with breakfast in bed.)*

*Then Mom says, "Okay, Ted, you run along now. I'll see you later." Ted goes into the kitchen to finish making breakfast.*

3. *A few minutes later, Mom goes to get something to eat. She hears noises in the kitchen and peeks in.  
She sees Ted making her Mothers' Day breakfast!*

*Mom says to herself, "Oh my goodness! Ted didn't make me a card, he's making me breakfast in bed!"*

*Ted does not see Mom watching him make the Mothers' Day breakfast.*

**Ling contr: Does Ted know that Mom saw him making her Mothers' Day breakfast in the kitchen?**

*(if yes: But remember, Ted did not see Mom watching him make the Mothers' Day breakfast.)*

4. *Later, Dad comes into the kitchen. Dad asks Ted, "Does Mom know what you are making her for Mothers' Day?"*

**TEST QUESTION #1:**

**Ignorance: WHAT DOES TED SAY?**

**Forced Choice: DOES TED SAY:**

"Yes, Mom knows what I am making her for Mothers' Day."

"No, Mom doesn't know what I am making her for Mothers' Day."

*NOW REMEMBER, TED DOES NOT KNOW THAT MOM SAW WHAT HE MADE HER FOR MOTHERS' DAY.*

Then Dad says to Ted, "What does Mom think you are making her for Mothers' Day?"

**TEST QUESTION #2:**

**Second order: WHAT DOES TED SAY?**

**Forced choice: DOES TED SAY:**

"Mom thinks I made her a card for Mothers' Day."

"Mom thinks I made her breakfast in bed for Mothers' Day."

**TEST QUESTION #3:**

**Justification: WHY DOES TED SAY THAT?**

## Story #2: SCHOOL SNACK/COOKIES

1. *This is a story about Amy and her mom.  
Today is the first day of school, and for Amy's school snack, Mom is surprising her with her favorite cookies.  
See? Here are Amy's favorite cookies.*
2. *Amy and Mom are in the kitchen talking about her first day at school.  
Amy says, "Mom, I really hope you packed me some cookies for snack."*  
  
*Now remember, Mom wants the cookies to be a big surprise, so she says, "Sorry Amy, I didn't have time to make them. I packed you an apple instead."*

**First order: What does Amy think Mom packed her for snack?**

**Reality: What did Mom REALLY pack her for snack?**

*(if incorrect: But remember, Mom wants to surprise Amy with her favorite cookies.)*

*Then, Amy says to Mom, "Okay, well, I'm going to go finish getting ready for school."*

3. *While she is getting ready for school, Amy opens her backpack to put in her books. In her backpack, Amy sees the cookies mom packed for snack!*

*Amy says to herself, "Wow! Mom didn't pack me an apple, she packed my favorite cookies!"*

*Mom does not see Amy open the back pack and look at the cookies.*

**Ling Contr: Does Mom know that Amy saw the cookies in the back pack?**

*(if yes: But remember, Mom did not see Amy open the back pack and look at the cookies.)*

4. *Later, Dad comes into the kitchen.*

*Dad asks Mom, "Does Amy know what you packed her for snack?"*

**TEST QUESTION #1:****Ignorance: WHAT DOES MOM SAY?****Forced choice: DOES MOM SAY:****“Yes, Amy knows what I packed her for snack.”****“No, Amy does not know what I packed her for snack.”**

*NOW REMEMBER, MOM DOES NOT KNOW THAT AMY SAW WHAT SHE PACKED HER FOR SNACK.* Then Dad says to mom, “What does Amy think you packed her for snack?”

**TEST QUESTION #2:****Second order: WHAT DOES MOM SAY?****Forced choice: DOES MOM SAY:****“Amy thinks that I packed her an apple.”****“Amy thinks that I packed her cookies.”****TEST QUESTION #3:****Justification: WHY DOES MOM SAY THAT?**

**Back up story: BIRTHDAY/BIKE**

1. *This is a story about Molly and her Dad.  
Today is Molly's birthday. For Molly's big present, Dad is surprising her with a new bike.  
See? Here's Molly's new bike in the garage.*

2. *Molly and Dad are in the kitchen talking about her birthday.  
Molly says, "Dad, I really want a new bike for my birthday."*

*Now remember, Dad wants the bike to be a big surprise, so he says, "Sorry, Molly, I didn't get you that. I got you a video game instead."*

**First order: What does Molly think Dad got her for her birthday?**

**Reality: What did Dad REALLY get her for her birthday?**

*(if incorrect: But remember, Dad wants to surprise Molly with a bike.)*

*Then Molly says to Dad, "Okay, well, I'm going over to my friend's house. I'll be home later".*

3. *On her way out, Molly goes out to the garage to get her umbrella because it's raining. In the garage, Molly finds her new bike!*

*Molly says to herself, "Wow! Dad didn't get me a video game, he really got me a bike!"*

*Dad does not see Molly go out to the garage and find the new bike.*

**Ling Contr: Does Dad know that Molly saw her bike in the garage?**

*(if yes: But remember, Dad did not see Molly go out to the garage and find the bike.)*

4. *Later, Molly's grandmother comes over for the party. She goes into the kitchen.*

*Grandma asks Dad, "Does Molly know what you got her for her birthday?"*

**TEST QUESTION #1:**

Ignorance: WHAT DOES DAD SAY?

Forced-choice: DOES DAD SAY:

**"Yes, Molly knows what I got her for her birthday"**

**"No, Molly does not know what I got her for her birthday"**

*NOW REMEMBER, DAD DOES NOT KNOW THAT MOLLY SAW WHAT HE GOT HER FOR HER BIRTHDAY. Then Grandma says to Dad, "What does Molly think you got her for her birthday?"*

**TEST QUESTION #2:**

Second order: WHAT DOES DAD SAY?

Forced-choice: DOES DAD SAY:

**"Molly thinks I got her a video game for her birthday."**

**"Molly thinks I got her a bike for her birthday."**

**TEST QUESTION #3:**

**Justification: WHY DOES DAD SAY THAT?**

**H. Theory of Mind Battery Answer Sheet**

(Task #1)

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Number: \_\_\_\_\_

DOB: \_\_\_\_\_ Gender: M F

Boy **walks by** the radio. Girl **picks up** the radio.Does the boy **have** the radio? Yes//No

\_\_\_\_ Boy pushes the box. Girl looks in the box.

Did the girl see what is in the box? Yes//No

☐Boy **throws** the frisbee. Girl **walks by** the frisbee.Did the boy **touch** the frisbee? Yes//No

\_\_\_\_ Girl pushes the box. Boy looks in the box.

Does the girl know what is in the box? Yes//No

☐Boy **throws** the ball. Girl **walks by** the ball.Did the girl **touch** the ball? Yes//No

\_\_\_\_ Boy looks in the box. Girl pushes the box.

Does the boy know what is in the box? Yes//No

☐Boy **walks by** the cat. Girl **picks up** the cat.Does the girl **have** the cat? Yes//No

\_\_\_\_ Girl looks in the box. Boy pushes the box.

Did the boy see what is in the box? Yes//No

☐

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**TOTAL (0-4)****(If 2 or more, continue onto next task. If less than 2, discontinue).**

**Task #2****Apple Basket**

Cont 1: Where apple basket before?    **Table**    Refrigerator    Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, before Maggie went out to play, Maggie and Mom put the apple basket on the table"

Cont 2: Where now?    Table    **Refrigerator**    Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, Mom put the apple basket in the refrigerator".

☐ Test IG: Maggie know where?    Yes    **No**    Other: \_\_\_\_\_

☐ Test FB: Where she look?    **Table**    Refrigerator    Other: \_\_\_\_\_

☐ Why: Why look there?

**Book**

Cont 1: Where book before?    **Sofa**    Drawer    Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, before Anne went outside, Anne and Sean put the picture book under the sofa"

Cont 2: Where now?    Sofa    **Drawer**    Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, Sean put the picture book into the drawer"

☐ Test IG: Anne know where?    Yes    **No**    Other: \_\_\_\_\_

☐ Test FB: Where she look?    **Sofa**    Drawer    Other: \_\_\_\_\_

☐ Why: Why look there?

**TOTAL (0-6) If scores more than 2 points, continue onto next task**



**ANSWER SHEET FOR BACKUP STORY (Task #2)****Cookie**

Cont 1: Where cookies before?                      **Frig**          Jar          Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, before Lisa went out to play, Lisa and Dad put the cookies in the refrigerator."

Cont 2: Where now?                                      **Frig**          **Jar**          Other: \_\_\_\_\_

\*\*If incorrect, say "Remember, Dad put the cookies in the jar"

☐ Test IG: Lisa know where?                      Yes          No                      Other: \_\_\_\_\_

☐ Test FB: Where she look?                      **Frig**          Jar                      Other: \_\_\_\_\_

☐ Why: Why look there?

**Task #3****Milk/Battery**Reality: What's really in the box?: Milk **Battery** Other: \_\_\_\_\_
☐ Rep Change: What DID you say was inside? Milk Battery  
Other: \_\_\_\_\_

FC: Milk Battery

☐ IG: Will X know what's in the box?: Yes **No** Other: \_\_\_\_\_

☐ FB: What will X say is in the box?: **Milk** Battery Other: \_\_\_\_\_
**Crayon box/Paper-clips**Reality: What's really in the box?: Crayons **Paper-clips** other: \_\_\_\_\_
☐ Rep Change: What DID you say was inside? Crayons Paper-clips  
Other: \_\_\_\_\_

FC: Crayons Paper-clips

☐ IG: Will X know what's in the box?: Yes **No** Other: \_\_\_\_\_

☐ FB: What will X say is in the box?: **Crayons** Paper-clips other: \_\_\_\_\_
**Back up Answer Sheet****Band-aid/Car**Reality: What's really in the box?: Band-aid **Car** Other: \_\_\_\_\_
☐ Rep Change: What DID you say was inside? Band-aid Car  
Other: \_\_\_\_\_

FC: Band-aid Car

☐ IG: Will X know what's in the box?: Yes **No** Other: \_\_\_\_\_

☐ FB: What will X say is in the box?: **Band-aid** Car Other: \_\_\_\_\_
**TOTAL (0-6)****If scores more than 2 points, continue onto next task**

**Task #4****MOTHERS' DAY/BREAKFAST**

FOFB: What does Mom think Ted made her for Mothers' Day?

Breakfast

**Card**

Other: \_\_\_\_\_

REALITY: What did Ted really get her?

**Breakfast**

Card

Other: \_\_\_\_\_

Ling Contr: Does Ted know that Mom saw him making her Mothers' Day Breakfast?

Yes

**No**

Other: \_\_\_\_\_

☐

IG: Does Mom know what you are making?

Yes

**No**

Forced Choice

\*\*If incorrect, say "Now remember, Ted does not know that mom saw what he made her for mother's day"

☐

FB2: What does Mom think you are making?

Breakfast

**Card**

Forced Choice (Other: \_\_\_\_\_)

☐

JUST: Why does Ted say that?

**SCHOOL SNACK/COOKIES**

FOFB: What does Amy think Mom packed her for snack?

Cookies

**Apple**

Other: \_\_\_\_\_

REALITY: What did Mom really pack?

**Cookies**

Apple

Other: \_\_\_\_\_

Ling Contr: Does Mom know that Amy saw the cookies in the backpack?

Yes

**No**

Other: \_\_\_\_\_

☐

IG: Does Amy know what you packed her for snack?

Yes

**No**

Forced Choice

\*\*If incorrect, say "Now remember, mom does not know that Amy saw what she packed her for snack"

☐

FB2: What does Amy think you packed her for snack?

Cookies

**Apple**

Forced Choice (Other: \_\_\_\_\_)

☐

JUST: Why does Mom say that?

**ANSWER SHEET (Back up story)****BIRTHDAY/BIKE**

FOFB: What does Molly think Dad got her for her birthday?

Bike

**Video Game**

Other: \_\_\_\_\_

REALITY: What did Dad really get her for her birthday?

**Bike**

Video Game

Other: \_\_\_\_\_

Ling Contr: Does Dad know that Molly saw her bike in the garage?

Yes

**No**

Other: \_\_\_\_\_

☐

IG: Does Molly know what you got her for her birthday?

Yes

**No**

Forced Choice

\*\*If incorrect, say "Now remember, dad does not know that Molly saw what he got her for her birthday."

☐

FB2: What does Molly think you got her for her birthday?

Bike

**Video Game**

Forced Choice

Other: \_\_\_\_\_

☐

JUST: Why does Dad say that?

**TOTAL (0-6)****OVERALL TOTAL (0-22)**