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**The Impact of Children with and without
Developmental Disabilities on Relationship Satisfaction and the Parenting Alliance**

A Dissertation Presented

by

Caitlin E. Walsh

to

The Graduate School

in Partial Fulfillment of the

Requirements

for the Degree of

Doctor of Philosophy

in

Psychology

(Clinical Psychology)

Stony Brook University

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Stony Brook University
The Graduate School

Caitlin E. Walsh

We, the dissertation committee for the above candidate for the
Doctor of Philosophy degree, hereby recommend
acceptance of this dissertation.

K. Daniel O’Leary, Ph.D. – Dissertation Advisor
Distinguished Professor, Psychology

Joanne Davila, Ph.D. - Chairperson of Defense
Professor and Director of Clinical Training, Psychology

Anne Moyer, Ph.D.
Associate Professor, Psychology

Joseph Blader, Ph.D.
Associate Professor of Psychiatry
University of Texas Health Science Center at San Antonio

Kathleen M. Feeley, Ph.D., BCBA
Associate Professor and Director, Center for Community Inclusion
Long Island University CW Post

This dissertation is accepted by the Graduate School

Charles Taber
Interim Dean of the Graduate School

Abstract of the Dissertation

The Impact of Children with and without

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Studies have shown that parents of children with ASD report greater negative impact of the child on family adaptation including financial stability, sibling relationships, and parents' social lives than parents of children with other chronic problems (e.g., Down syndrome, ADHD, ODD). Parents of children with ASD also report increased marital discord and parent stress. Currently there are no studies examining differences in parent perceptions of child impact and how this factor may influence parental relationships, particularly parents' spousal relationships and agreement on co-parenting. In this study, 157 mothers of children with an Autism Spectrum Disorder (ASD), Down syndrome (DS), and Typically Developing (TD) children completed measures online that assessed child impact on the family, marital satisfaction, co-parenting alliance, and child symptom severity. Results showed that mothers of children with ASD reported greater negative impact, lower marital satisfaction, decreased parent alliance, and higher child symptomatology compared to both other groups. Contrary to past research, the DS group did not differ from the TD group on measures of marital satisfaction and parent alliance. Further, child impact negatively predicted marital satisfaction and parent alliance for the ASD group only. Implications are discussed in terms of family adaptation and resilience for parents of children with developmental disabilities. Treatment considerations include a focus on improving parenting and marital relationships as well as child behavior in order to improve quality of life for families of children with ASD.

Dedication Page

I dedicate this dissertation to my late mentor, Dr. Edward (Ted) Carr, who believed in me and gave me a chance to achieve my dream. He was a brilliant researcher and a pioneer in the field of functional behavior assessment and intervention for problem behavior in individuals with autism and other developmental disabilities. I hope to honor Ted's work throughout my career both in the research I pursue and with families that I work with clinically. Ted's enthusiasm, dedication, and passion are qualities of his that live on and continue to inspire me.

I also dedicate this dissertation to my late grandfather, Aaron Roses, who had a passion for life, nature, and knowledge. I like to believe that I inherited these characteristics from him and hope to live my life with the same passion, dedication, and pursuit of knowledge that he had in his.

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List of Abbreviations

Autism Spectrum Disorder = ASD

Center for Disease Control = CDC

Diagnostic and Statistical Manual = DSM-IV

Autistic Disorder = AD

Asperger's Syndrome = AS

Pervasive Developmental Disorder-Not Otherwise Specified = PDD-NOS

Developmental Disability = DD

Down's Syndrome = DS

Typically Developing = TD

Attention Deficit Hyperactivity Disorder = ADHD

Oppositional Defiant Disorder = ODD

Intellectual Disability = ID

Pervasive Developmental Disorder = PDD

Child Symptom Inventory = CSI-4

Family Impact Questionnaire = FIQ

Parenting Alliance Measure = PAM

Dyadic Adjustment Scale-Short Form = DAS-SF

Attention Deficit Hyperactivity Disorder-Inattentive Type = ADHD-I

Attention Deficit Hyperactivity Disorder-Hyperactive Type = ADHD-HI

Conduct Disorder = CD

Generalized Anxiety Disorder = GAD

Separation Anxiety Disorder = SAD

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Major Depressive Disorder = MDD

Positive Behavior Support = PBS

Quality of Life = QOL

Positive Family Intervention = PFI

Socioeconomic Status = SES

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Finally, I am especially grateful to the families who participated in this study. Without them, this study would not be possible.

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Introduction

Autism spectrum disorder (ASD) is a pervasive developmental disorder that is defined by deficits in three main areas of functioning: communication, socialization, and repetitive behaviors (APA, 1994). The most recent finding published from the Center for Disease Control (CDC) indicated that 1 out of 68 children are diagnosed with ASD (Baio, 2014). The term “autism spectrum disorder,” which will be used throughout this study, encompasses the broader spectrum of clinical characteristics that define autism and represents three of the pervasive developmental disorders defined in the DSM-IV: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). It should be noted that the diagnosis of ASD changed in DSM-5, such that the diagnosis was consolidated into a single disorder, however the DSM-IV diagnoses were used herein.

The impact of raising a child with ASD is pervasive, affecting families’ financial stability (Sharpe & Lee Baker, 2007), siblings’ functioning (Rodrigue, Geffken, & Morgan, 1993), and parents’ overall well-being (Macks & Reeve, 2007). The present study addresses how having a child with a developmental disability (DD) impacts mothers’ marital functioning and parenting alliance. Currently, there is no research in the autism literature on differences in parent perceptions of child impact and how this factor may influence parental relationships, particularly parents’ relationships with their spouses and the parenting alliance. Thus, in the present study, one goal was to determine whether there were differences in mothers’ report of positive and negative impacts of children with an autism spectrum disorder (ASD), Down syndrome (DS), and Typically Developing (TD) children, as well as differences in parenting agreement and marital satisfaction. An additional goal was to determine whether there were differences between

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the three diagnostic groups in the relationship between child impact, mothers' marital relationship, and parental alliance.

An area that has received extensive support is the ABCX model of family adaptation to a child's disability (McCubbin & Patterson, 1983; Hodapp, 1995). In this model, "A" is the primary stressor (i.e., child with ASD), "B" is the family's resources to cope with the stressor, "C" is the parent's perceptions of the child (i.e., the way the parent thinks about the child), and "D" is the overall family outcome (i.e., resilience or stress). Recently, researchers have been interested in factors related to parents' positive and negative appraisals of their child with ASD, which can be identified as the "C" in the ABCX model (Bishop et al., 2007; Carr & Lord, 2012). While it is important to understand what contributes to a family's perceptions of the child, it is also crucial to identify how negative appraisals influence various outcomes for the family, particularly parental and family outcomes.

An important part of the family system is the parent-child relationship, and researchers have shown that parents of children with ASD experience higher levels of stress compared to families who are unaffected by childhood disability or parents of children with other disorders (e.g., ADHD, ODD, intellectual disability; Baker, McIntyre, Blacher, Crnic, et al., 2003; Hastings, 2002; Lee, Harrington, Louie, & Newschaffer, 2008; Tomanik, Harris, & Hawkins, 2005). Another major aspect of the family system is the parenting relationship, namely the marriage and the co-parenting alliance between parents. It is important to better understand factors associated with marital and parenting quality in families of children with ASD in order to inform treatments that can address both child and family problems and increase quality of life for the entire family.

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Child Impact on the Family

Perceived impact is conceptualized as the degree to which a caregiver reports positive or negative experiences (e.g., financial, social, or emotional) as a result of having a child with a disability (Messer et al., 1996). It is a mode of cognitive appraisal and research suggests that the way a person thinks about a stressor can influence their overall well-being (Trute, Hiebert-Murphy, & Levine, 2007). Subjective interpretation of the stressor is a key element in the ABCX model (i.e., “C” factor), and it is one component that can determine the difference between crisis and adaptation (Saloviita, Italinna, & Leinonen, 2003; Trute et al., 2007). Research indicates that parents of children with developmental disabilities (DD) have both positive and negative perceptions of the child, which in turn are related to both child factors (e.g., problem behavior) and overall family functioning (Hassall & Rose, 2005; Bishop, Richler, Cain, & Lord, 2007).

Outcomes associated with perception of child impact

Saloviita et al. (2003) assessed mothers and fathers of children with intellectual disability (ID) and found that poorer adaptation was associated with the mother’s appraisal of the child’s disability as a catastrophe, maternal self-blame, and additional family stresses. They concluded that the most important predictor of parent stress was parent appraisal. Another study on parent perception of childhood disability found that mothers and fathers of children with developmental disabilities (i.e., Down syndrome, developmental delay, visual and hearing impairment) reported comparable positive and negative perceptions of their child (Trute & Hiebert-Murphy, 2002). Higher negative appraisals were associated with more parenting stress. Increased positive perceptions buffered this relationship and predicted higher self-esteem and long-term family adjustment. The researchers followed up the sample after a 7-year period and found that parents’ appraisals of their children remained stable, suggesting long-term maintenance of negative (and

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positive) cognitions about childhood disability (Trute & Hiebert-Murphy, 2002).

Maternal self-esteem was also related to early assessment of the positive and negative impacts of children on the family (Trute et al., 2007). Researchers assessed parents of children with various developmental disabilities (e.g., autism, PDD, Down syndrome, Fragile X syndrome) and found that for mothers of children with DD, increased negative appraisals of child impact were related to lower self-esteem, which were further predictive of lower levels of overall family well-being. Additionally, Bishop et al (2007) found that there were also ethnic differences in parents' perceived impact of a child with ASD such that African American mothers were shown to report significantly less negative impact than Caucasian mothers. In terms of treatment implications, evidence suggests that parents who report greater negative impact of their child are more likely to seek intervention services (Angold, Messer, Stangl, Farmer, et al., 1998).

Most of the research on the impact of children with DD on the family has focused on various child factors (e.g., behavior problems) that contribute to increased negative perceptions. Bishop et al. (2007) demonstrated that predictors of negative impact included lower child adaptive behavior, more restricted and repetitive behaviors, fewer children in the family, and lower levels of social support. Additionally, Carr and Lord (2012) found that perceived negative impact increased over time from childhood to adolescence for parents of children with ASD. Familial factors such as lower education and ethnicity predicted greater negative appraisals of the child. Similar to the study by Bishop et al. (2007), child behavior problems and lower adaptive behavior also predicted higher negative impact for parents (Carr & Lord, 2012).

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The Marital Relationship

The addition of children regardless of the presence of DD can change social roles within the family structure and couples may experience restriction of freedom and decreased sexual intimacy due to increased demands to care for their children (Twenge, Campbell, & Foster, 2003). There also tends to be a high financial cost to having a child, which has also been shown to decrease marital satisfaction (Twenge et al., 2003). These difficulties are present among most parents, but may be exacerbated by having a child with a disability.

There has recently been an increased interest in the effect of having a child with DD on mothers' and fathers' relationship satisfaction and divorce rate. It is important to note that the studies discussed herein focus on general DD (i.e., ID, ASD, Fragile X), rather than ASD specifically. Research has linked factors associated with having a child with DD to higher levels of parenting stress, higher divorce rates, and lower marital satisfaction (Abbeduto et al., 2004; Brobst et al., 2009; Bristol, Gallagher, & Schopler, 1988; Hartley, Barker, Floyd, Greenberg, et al., 2010; Walsh & O'Leary, 2013). Parents of children with DD provide more time, energy, and resources for their child, endure these demands for a longer period (Seltzer, Greenberg, Floyd, Pettee, & Hong, 2001) and they also tend to have a higher financial burden due to the number of caretaking, therapeutic, and medical services required by their child (Sharpe & Lee Baker, 2007). Further, couples experience increased role strain because of the time and effort needed to parent a child with DD (Baker et al., 2003). Additionally, fathers' involvement in childcare has also been shown to be lessened in couples parenting a child with DD, which is related to decreased marital satisfaction for mothers (Konstantareas & Homatidis, 1992).

Outcomes associated with marital relationships

In parents of typically developing (TD) children, a spillover effect has been reported

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between the marital relationship and the parent-child relationship in that positive or negative aspects of one flow into the other (Easterbrooks & Emde, 1988). Increased marital discord is suggestive of parents' inability to resolve problems collaboratively and effectively (Floyd & Zmich, 1991). Discordant couples are more likely to engage in maladaptive conflict resolution techniques such as blaming and verbal abuse. Additionally, discord in the marriage can be a source of stress that reduces parents' ability to effectively parent their children (Belsky, 1984). Further, relationship turmoil is associated with inconsistent discipline and child-rearing practices, which is related to increased child problem behavior and other externalizing problems in typically developing children (Stoneman, Brody, & Burke, 1989; Downey & Coyne, 1990). Parents who are less satisfied with their marriage may have poor communication and frequent disagreements about parenting, which may lead to differences in discipline between the parents (Erel & Burman, 1995). Parents are then unable to set consistent limits, which provides the child with opportunities to manipulate contingencies and leads to more problematic behaviors (Emery, Joyce, & Fincham, 1987).

A recent study on child ASD symptomatology and parent conflict showed that higher family conflict was associated with greater anxiety and depression in children with ASD as well as increased ASD symptoms (Kelly, Garnett, Attwood, & Peterson, 2008). In other clinical populations (e.g., children with ADHD), relationship discord predicts higher child deviance and aggression (Webster-Stratton & Hammond, 1990). Important to families of children with ASD, relationship problems can interfere with success of parenting interventions. For example, Baker, Landen, and Kashima (1991) demonstrated that greater relationship discord in parents predicted significantly poorer outcomes in a parent training intervention for child problem behavior.

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The Parenting Alliance

An important aspect of the marital relationship with regard to parenting is the parenting alliance, which is defined as the degree of commitment and agreement on child rearing between partners and is considered to be separate from the intimate, sexual nature of the couple's marriage (Weissman & Cohen, 1985). This alliance underlies parents' ability to effectively co-parent their child and is related to actual parenting behaviors. An understanding of the parenting alliance between parents is particularly useful in that it provides an indicator of how a couple might parent their child after a divorce. A strong parenting alliance has been shown to buffer child effects from divorce and also mitigate negative effects of child behavior problems on the parents (Weissman & Cohen, 1985; Schoppe, Mangelsdorf, & Frosch, 2001).

Outcomes associated with the parenting alliance

The parenting alliance has been shown to relate to child problem behavior even after controlling for the marital relationship in parents of children without DD (Bearss & Eyberg, 1998). Bearss and Eyeberg (1998) assessed parents' marital satisfaction, agreement on parenting, and child problem behavior. Child behavior was significantly predictive of the parenting alliance, but there was a non-significant relationship between problem behavior and the marital relationship when controlling for the parenting alliance. In other studies, a strong alliance was shown to be related to lower parenting stress and increased involvement in parenting (Abidin & Brunner, 1995; McBride & Rane, 1998). Further, McBride and Rane (1998) found that agreement on parenting was a stronger predictor of paternal involvement than marital satisfaction.

Child factors have also been studied in relation to the parenting alliance. Abidin and Brunner (1995) demonstrated that the alliance was positively related to child adjustment and

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social competence. A strong partnership is also predictive of increased psychological adjustment and decreased behavior problems in typically developing boys (Bearss & Eyeberg, 1998).

There has only been one study to date that assessed the parenting partnership in parents of children with DD. Floyd and Zmich (1991) assessed marital and parenting predictors of parent-child interactions in a typically developing sample and a group of children with ID. Parents of children with ID who had a stronger parenting alliance reported increased parental competence and less aversive parent-child interactions. In a sample of parents with children diagnosed with a chronic illness, a strong parenting alliance moderated the effects of childhood illness on fathers' parenting stress (Frank, Olmsted, Wagner, Laub, Freeark et al., 1991).

There is a lack of research on the parenting alliance in families of children with ASD and other DD. The parenting alliance is important to research because it particularly relates to children's behavior and it provides an indicator of relational functioning in the marital dyad, which has already been shown to be strained in these families. Extensive research has demonstrated that parents of children with DD experience increased role strain and parenting stress (Fox et al., 2002; Hastings, 2002; Koegel et al., 1992); thus, it is likely that parenting a child with ASD could negatively impact the parenting relationship and make it more difficult for parents to build a strong alliance.

An important aspect of the parenting alliance is agreement on parenting practices, which is particularly important for children with ASD because a lack of consistency in parenting can result in increased child behavior problems (Howlin, 1998). One of the hallmark features of children with ASD is an inflexible adherence to specific routines or insistence on sameness (DSM-IV, 1994). The best parenting practices for children with ASD are ones that are consistent and predictable, therefore it seems important that parents have a strong partnership, which has

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shown to be predictive of effective parenting skills. Given the importance of the parenting partnership, it is important to understand factors that may influence it in families of children with ASD.

The Present Study

Parents are an important aspect of treatment for children with ASD and evidence suggests that couples in strained marriages or with weak parenting alliances are not as consistent in implementing interventions or may drop out from treatment prematurely (Andra & Thomas, 1998; Baker, Landen, & Kashima, 1991). Further, there is a lack of consensus on whether child factors such as behavior problems are directly detrimental to marriages or if other factors present (i.e., poor parenting agreement or other stressors) are related to marital quality (Bears & Eyeberg, 1998). Most of the research on marital satisfaction in parents of children with DD consider it as a variable that contributes to the broader area of parent stress. Thus, it is difficult to determine how much general parent stress is contributing to decreased marital satisfaction and how much it is due to external stressors such as child impact (Stoneman & Gavidia-Payne, 2006).

To address a gap in previous research, the present study is designed to better understand the relationship between child factors and dyadic relationships specifically through assessing the marital and parenting relationship separately. The following main hypotheses were derived based on the aforementioned evidence: 1) Mothers of children with ASD will report lower levels of perceived parenting alliance, lower marital satisfaction, and greater negative child impact on the family than parents of children with DS and TD children. 2) Symptom severity will be greatest for children with ASD compared to the other two groups. 3) Within the ASD sample, overall negative impact will significantly predict the parenting alliance and marital satisfaction;

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however, when controlling for symptom severity the relationship between negative impact and marital satisfaction will diminish.

Method

Participants

Mothers were recruited from several different sources. Mothers of children with Down syndrome were recruited from the Down Syndrome Advocacy Foundation and mothers of children with ASD were recruited from the Northeastern chapters of the Autism Society of America. Mothers of typically developing children were recruited from the Long Island Parenting Magazine. The total sample included 157 mothers including, 54 mothers of children with Down syndrome, 56 mothers of children with ASD, and 47 mothers of typically developing children. The children ranged in age from 3-9 years old (DS Mean = 4.87, SD = 1.62; ASD Mean = 6.37, SD = 1.8; TD Mean = 5.31, SD = 1.9); 99 were male and 57 were female. Reported ethnicity was 5.1% Asian, 2.5% Black/African American, 10.8% Hispanic, 78.5% White/Caucasian, and 2.5% Other. Table 1 displays the breakdown of important demographic information separated by child diagnosis. Children with ASD and DS who had comorbid psychological or medical disorders (e.g., anxiety, tics, diabetes) were included in the study, however TD children were only included if they had never been diagnosed with a developmental disorder.

In terms of child diagnosis, 31 were diagnosed with Autistic disorder, 3 with Asperger's syndrome, and 14 with PDD-NOS. Additionally, 3 children were diagnosed with an Intellectual Disability. In order to be included in the study, parents were required to meet the following criteria: (a) has a biological child between the ages of 3-9 who is typically developing or who meets criteria for ASD or DS and (b) is married or living with the biological parent of the target

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child for at least 2 years. Diagnosis of ASD was verified through parent report of child diagnosis and the Autism subscale on the Child Symptom Inventory-4 (CSI-4). A child's diagnosis of DS was verified by parent report.

Measures

The Family Impact Questionnaire (FIQ; Donenberg & Baker, 1993). The FIQ is a 50-item questionnaire that assesses parent's appraisal of the impact of their child on the family. Parents evaluate the child's impact across several dimensions of family functioning including: Impact on social life, negative feelings toward child, positive feelings toward child, impact on finances, impact on marriage, and impact on siblings. Each item is rated on a 4-point Likert scale with 0 = Not at all and 4 = Very much. A general negative impact score is generated by summing the first two subscales (social life and negative feelings toward child). For the purposes of the proposed study, the marital impact subscale was not used because marital satisfaction was measured separately (described below). In a study assessing parents of children with ID, Cronbach's alphas for negative impact were .92 for mothers and .89 for fathers (Baker et al., 2003). Reliability data for this sample for all measures is reported in Table 2.

The Parenting Alliance Measure (PAM; Abidin & Konold, 1999). The PAM is a 20-item self-report assessing the degree to which parents believe they have a sound parenting relationship with their child's other parent. Parents were asked how much they agree (5=Strongly agree, 1=Strongly disagree) with various statements such as, "My child's other parent and I communicate well about our child." Reliability and validity of the PAM has been established across studies (Hughes, Coop Gordon, & Gaertner, 2004; Konold & Abidin, 2001), and Cronbach's alpha is high, $r = .97$, (Abidin & Brunner, 1995).

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Dyadic Adjustment Scale (DAS-SF; Sharpley & Cross, 1982). Marital quality was assessed using the short form of the DAS, which includes 7-items from the original 28-item original measure (Spanier, 1976). Three items assess dyadic agreement (e.g., “agreement on philosophy of life”), three assess dyadic cohesion (e.g., “have a stimulating exchange of ideas”), and one item assesses global dyadic satisfaction. Parents rate six of the items on a 5-point Likert scale and they rate the one satisfaction item on a 6-point scale. Possible scores on the DAS-SF can range from 1-37 with scores below 21 indicating marital distress. Good validity and reliability have been reported in many studies (Benson & Kersh; Hunsley et al., 1995, 2001).

Child Symptom Inventory – 4 (CSI-4; Gadow & Sprafkin, 2002). Parents completed the CSI-4, which assesses various childhood psychiatric disorders based on DSM-IV diagnostic criteria. The items are rated on a 4-point Likert scale (0=Never to 3=Very often) and each item corresponds to a DSM-IV symptom. The symptom categories assessed in the measure are as follows: ADHD, Inattentive type (ADHD:I; 9 items); ADHD Hyperactive-Impulsive type (ADHD:HI; 9 items); ADHD, Combined type (ADHD:C; 18 items); ODD (8 items); CD (15 items); GAD (8 items); social phobia (3 items); SAD (8 items); MDD (10 items); schizophrenia (5 items); autistic disorder (12 items), and Asperger’s disorder (8 items). There are also several single item questions on the CSI-4 that screen for simple phobias, obsessions, compulsions, motor tics, vocal tics, enuresis, and encopresis. An overall symptom severity score was generated for each disorder. Only the following disorders were assessed in the present study: ADHD I & HI, ODD, GAD, social phobia, SAD, and autistic disorder. The CSI-4 has been used with ASD and TD samples across multiple studies. Internal consistency reliabilities (Cronbach’s alpha) have been reported in many studies. Internal consistency for the disorders assessed in the present study is as follows: .92 (ADHD-I), .91 (ADHD-HI), .91 (ODD), .75 (GAD), .77 (social phobia),

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.79 (SAD), and .73 (autistic disorder) (Gadow & Sprafkin, 2002). Test-retest reliability has been shown to be relatively stable with coefficients of at least .65 for symptom severity (Sprafkin, Gadow, Salisbury, Schneider, & Loney, 2002).

Procedure

Recruitment information describing the study were posted on online listservs and contained a website link to the consent forms. All parents completed the questionnaires online through SurveyMonkey. Upon following the link, parents first completed the consent form and then proceeded to the study questionnaires. Parents could discontinue participation at any time. Only participants who completed 90% or more of the questionnaires received a \$20 Amazon.com gift card. At the end of the study, parents were asked to provide an e-mail address in order to receive the gift card. Battery completion took about 45-minutes and all participants completed the questionnaires in the same order.

Results

Data Analysis

Prior to conducting analyses, participants who did not complete 80% of questions were excluded from analyses. There were 66 participants who consented and began the study, but were not included in analyses because either a) they did not meet rule-out requirements or b) they did not complete 80% of the study questionnaires. Missing data were handled using within case substitution for each questionnaire. As necessary, variables were then transformed in order to meet assumptions of normality for multivariate analyses. Specifically, all subscales on the CSI-4 were negatively skewed, therefore a root transformation was used to correct for skewness and kurtosis. The data was screened for potential confounders using the following demographic variables, ethnicity, number of children living in household, child sex, household income, and

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education. To test for main effects and significant relationships between variables, a series of multivariate and univariate analyses were conducted across the three groups on the scale and subscale scores of the FIQ, DAS-SF, PAI, and CSI-4. Bivariate correlations among all measures are presented in Table 3.

Screening for Confounders

A Chi-square test was used to determine whether there were any group differences of specific demographic variables. There were significant differences between the three diagnostic groups on ethnicity, $X^2 (df = 2) = 6.56, p = .038$ and child sex, $X^2 (df = 2) = 10.88, p = .004$. Across the three groups there were more male children than female children, however, there were significantly more males in the DS and ASD groups compared to the TD group. A one-way MANOVA showed that the groups differed on both household income, $F(2, 151) = 9.23, p < .001$, and education, $F(2, 151) = 3.37, p = .04$. Mothers of typically developing children reported having higher education than parents of children with ASD and DS, however mothers across three groups had a high education overall (college or higher). Similarly, the same pattern was seen for total family income and all three groups reported generally high income.

In order to determine which variables to control, a multivariate multiple regression analysis was used to determine which of the potential confounding variables were significantly related to all outcome variables. Child sex, $F(21, 110) = 2.35, p = .002$, and parent education, $F(21, 110) = 2.04, p = .009$, were the only variables significantly related to all outcomes and were therefore determined to be possible confounders. These variables were controlled for in all subsequent analyses.

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Between Group Differences on Child Impact

Multivariate analyses (MANCOVA) were used to test whether there were differences in total family impact between mothers of children with ASD, DS, and typically developing children. Raw scores were used for analyses. Table 4 depicts the means and standard deviations for the FIQ subscales by group. The results of the multivariate analysis for group effect was significant, $F(10, 266) = 13.59, p < .001$, demonstrating that the three diagnostic groups significantly differed on the set of outcomes, taken as a set. When child sex and parent education were added as covariates the model did not change. Univariate analyses showed that the three groups significantly differed on negative feelings about parenting, $F(2, 137) = 33.59, p < .001$, positive feelings toward parenting, $F(2, 137) = 20.04, p < .001$, overall impact on social life, $F(2, 137) = 70.15, p < .001$, overall financial impact, $F(2, 137) = 19.35, p < .001$, and overall impact on siblings, $F(2, 137) = 22.85, p < .001$.

Post-hoc pairwise comparisons of the univariate outcomes showed that as predicted, mothers of children with ASD reported greater negative feelings toward parenting, $M=1.48, p < .001$, greater social impact, $M= 1.48, p < .001$, greater financial impact, $M=1.55, p < .001$, and greater sibling impact, $M=.98, p < .001$, than mothers of children with DS and TD children. A subsidiary hypothesis was that mothers of children with ASD would not differ from the other groups on positive feelings toward parenting, however contrary to this hypothesis they reported lower positive feelings toward parenting, $M=1.23, p < .001$. Mothers of children with DS differed from the TD group on sibling impact only, $M=.57, p = .05$, and did not differ on the other measures of child impact. Table 5 shows a detailed summary of the multivariate outcomes for all main variables.

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Between Group Differences on the Parent Alliance and Marital Relationship

The two main relationship variables herein include parenting alliance and the marital relationship, however marital satisfaction was further broken down into agreement and cohesiveness. Table 3 depicts the means and standard deviations for the PAM and the DAS by group. The result of the multivariate analysis for group effect was significant, $F(6, 296) = 6.92, p < .001$ for all relationship variables. Univariate analyses determined that the three diagnostic groups differed on parent alliance, $F(2, 150) = 18.27, p < .001$. Based on post-hoc analyses, as expected, mothers of children with ASD reported lower agreement on parenting, $p < .001$, than mothers of children with DS and TD children. There was no difference between mothers of children with DS and mothers of TD children on parent alliance. Figure 1 shows the differences between each group on the marital and parenting variables.

Regarding the marital relationship, univariate analyses determined that the three diagnostic groups differed on agreement, $F(2, 150) = 9.26, p < .001$, but did not differ on cohesion, $F(2, 150) = 2.61, p = .08$. The pattern of results revealed that the ASD group ($M=3.17$) reported lower agreement with spouse, $p < .001$, than both the DS ($M=3.75$) and TD ($M=3.82$) groups. Mothers of children with DS did not differ from mothers of TD children on agreement with spouse, $p = .69$. Conversely, there was no difference between the groups on marital cohesion (ASD $M = 2.61$; DS $M = 3.12$; TD $M = 3.00$).

When examining differences in marital satisfaction, ANCOVA results demonstrated that the three groups differed on overall marital happiness, $F(2, 150) = 9.52, p < .001$. More specifically, as expected, mothers of children with ASD ($M=2.62$) reported lower marital satisfaction than mothers of children with DS ($M=3.83$) and TD children ($M=3.46$), $p < .001$, and there was no difference between the DS and TD groups on marital satisfaction, $p = .23$.

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Between Group Differences on Child Symptom Severity

Additional multivariate analyses were used to test between group differences on specific subscales (i.e., ADHD-I, ADHD-HI, ODD, GAD, social phobia, SAD, autistic disorder) of the CSI-4, a measure of child symptom severity on different DSM-IV diagnoses. Table 3 depicts the means and standard deviations for each subscale on the CSI-4. For the overall sample, the level of child symptom severity was low considering there are two clinical samples. The results of the multivariate analysis for group effect was significant, $F(24, 270) = 12.42, p < .001$. Univariate analyses revealed that there were significant group differences on each subscale, warranting further post-hoc comparisons by group.

Within the externalizing domain, which included diagnoses of ADHD and ODD, children with ASD were rated as higher on symptoms of ADHD-Inattention, ADHD-Hyperactivity, and ODD, $p < .001$ than children with DS and TD children, as predicted. Children with DS had higher symptoms of ADHD-I and ADHD-HI than TD children, $p < .001$, however, these two groups did not differ on symptoms of ODD, $p = .55$.

The internalizing domain included diagnoses of GAD, OCD, social phobia, and SAD. As expected, mothers rated children with ASD as higher on symptoms of each internalizing disorder, $p < .001$ respectively. There were no differences between the DS and TD groups on GAD, $p = .24$, OCD, $p = .49$, social phobia, $p = .49$, and SAD, $p = .74$. Children with ASD were reported to have the highest level of autism symptoms compared to children with DS and TD children, $p < .001$. Children with DS were also rated with significantly higher symptoms of autism than TD children, $p < .001$.

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Child Impact on Parents' Marital and Parenting Relationship

The next set of analyses focused on measuring the relationship between child impact and parents' relationship, including marital satisfaction and parenting alliance. Multivariate analysis revealed a significant relationship between child impact and both relationship factors, taken as a set, $F(2, 148) = 6.48, p = .002$. Univariate analyses showed that there was a significant relationship between child impact and parenting alliance, $F(1, 149) = 13.04, p < .001$, as well as marital satisfaction, $F(1, 149) = 7.24, p = .008$. Post-hoc regression analyses indicated a significant negative relationship between child impact and parent alliance, $t(149) = -3.61, p < .001, (\beta = -.73)$, effect size (partial r) = $-.28$. There was also a significant negative relationship between child impact and marital satisfaction, $t(149) = -2.69, p < .001, (\beta = -.379)$, effect size (partial r) = $-.21$.

Group Specific Outcomes

Multivariate analyses were used to determine how child impact related to parent alliance and marital satisfaction within each diagnostic group. Within the DS group, child impact was significantly related to both relationship factors, taken as a whole, $F(2, 49) = 3.20, p = .05$. More specifically, child impact significantly negatively predicted parent alliance, $F(1, 50) = 6.52, p = .01$, effect size (partial r) = $.34$, but was not predictive of marital satisfaction. These results indicate that mothers of children with DS who report greater negative impact of their child have decreased agreement in parenting with their spouse, but there is an insignificant effect on their overall marital relationship. Within the TD group, child impact was not significantly related to parent alliance or marital satisfaction, therefore follow-up analyses were not interpreted.

Child impact was significantly related to both relationship factors, taken as a whole, for mothers of children with ASD, $F(2, 51) = 3.22, p = .05$. As predicted, child impact negatively

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predicted both parent alliance, $F(1, 52) = 6.34, p = .02$, effect size (partial r) = .33, and marital satisfaction, $F(1, 52) = 5.41, p = .02$, effect size (partial r) = .32. When controlling for autism symptom severity this relationship did not change. These results indicate that mothers of children with ASD who report greater negative impact of their child have decreased agreement in parenting with their spouse as well as lower overall marital happiness.

Discussion

This is the first study to examine differences in child impact on the family, the marital relationship, and the parenting alliance across parents of children with ASD, DS, and TD children. Research has shown that raising a child significantly impacts families and that this impact may be exacerbated if the child is diagnosed with a developmental disability. The main goal of the present study was to determine whether there were differences in how mothers of children with ASD, DS, and TD children perceived the impact of their child on various aspects of their life (i.e., financial, social, sibling). A secondary goal was to establish how children impact marriages and the co-parenting relationship for the three diagnostic groups.

As expected, mothers of children with ASD reported greater overall negative impact of their child as well as greater negative impact on financial stability, social life, and sibling relationships compared to mothers of children with DS and TD children. Interestingly, mothers of children with ASD also reported lower overall positive perceptions of child impact on the family, which was counter to the hypothesis that there would be no difference between diagnostic groups. In a model developed by Konstantareas (1991), child-related stress refers to the kinds of challenges parents face as a result of their child's behavioral or medical challenges. The results herein suggest that mothers of children with ASD experience significantly more child-related stress across multiple domains. The present study supports the findings of previous

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studies in which parents of children with ASD experienced more financial hardship (Sharpe & Lee Baker, 2007), were more socially isolated, and were also more likely to feel stressed by their child's odd or challenging behaviors than parents of TD children or children with other chronic conditions (Konstantareas & Homatidis, 1989).

In terms of mothers' positive perceptions about their children, results were contrary to hypotheses. However, a study by Hoppes and Harris (1990) showed similar results to this study in that mothers of children with ASD reported lower levels of gratification (pleasure, positive emotion) than mothers of children with DS. The researchers concluded, based on their findings, that mothers' decreased gratification was directly related to the extent to which they perceived their child as expressing emotional responsiveness, attachment, and reciprocity (Hoppes & Harris, 1990). Several of the "positive perception" questions on the FIQ involve the child's ability to express emotion, enjoyment, and love toward the parent. As a core feature of ASD is difficulty in relating with others, it is likely harder for parents to develop an affectionate, reciprocal relationship with their child, thus influencing overall positive perceptions.

Mothers of children with ASD in the present study also reported lower global marital satisfaction as well as marital agreement compared to the other two groups. In terms of marital cohesion (i.e., the degree of emotional bonding and support between spouses), however, mothers of children with ASD did not differ from mothers of children with DS and TD children, suggesting that partners may remain relatively bonded even though agreement in the relationship is lower. These results may seem grim for the marriages of parents of children with ASD. However, it does not necessarily mean that these marriages are doomed to fail. The majority of mothers in the ASD sample were married for over 10 years to the biological father of their child with ASD and only eight mothers had experienced a divorce. Instead, the results suggest that

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parents endure more stress and, as a consequence, may be less satisfied in their relationships.

When reviewing the three specific questions on the DAS-SF that refer to marital agreement, one question refers to “amount of time spent together,” which can be significantly affected by having children and even more affected if the child has ASD. In the marital literature, shared time has been shown to increase marital solidarity, but in at least one study wives’ perception of time spent together did not significantly affect marital discord (Gager & Sanchez, 2003).

Mothers in the ASD group also reported lower parenting alliance than the other groups. It is important to consider the effects of the parenting alliance on families because studies have shown that it plays a central role in both parenting and marital relationship dynamics. For example, the results of one study indicated that parent alliance mediated the relationship between marital quality and parenting experiences (Floyd, Gilliom, Costigan, 1998). Specifically, couples with more positive marriages who were also aligned on parenting roles were more likely to report more confidence in their parenting abilities and less negative interactions with their child (Floyd et al., 1998). Specific aspects that might contribute to the alliance are parents’ communication, parenting roles, and confidence in the other parent’s abilities to parent effectively. Mothers of children with ASD are the common caretakers and the ones most frequently involved in treatment (Konstantareas & Homatidis, 1992). Therefore, there seem to be a greater likelihood that mothers would report rifts in the parenting alliance.

In addition, there are generally more complex decisions to be made between parents for their child with ASD, including treatment, school placement, medical, and financial choices. Parents of children with ASD also experience greater levels of stress and emotional exhaustion compared to parents of children with other chronic medical or psychiatric conditions (Dumas, Wolf, Fisman, & Culligan, 1991; Noh, Dumas, Wolf, & Fisman, 1989; Bouma & Schweitzer,

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1990), which may compromise their ability to maintain a strong parent alliance. There are also several inherent differences in parents of children with DS as compared to parents of children with ASD. Specifically, parents of children with DS are aware of the diagnosis typically during pregnancy and make a choice as a parenting unit whether to keep the child or terminate the pregnancy. Additionally, children with DS have similar cognitive impairments to children with ASD, however they lack the social deficits and often lack the severity of problematic or challenging behavior that children with ASD have.

As expected, children with ASD were reported to have significantly higher psychiatric symptomatology than children with DS and TD children. Specifically, children with ASD were reported to have higher levels of symptoms for ADHD-Inattention, ADHD-Hyperactivity, and ODD (Externalizing domain), as well as GAD, OCD, social phobia, and SAD (Internalizing domain). It should be noted, however, that although parents of children with ASD rated their children as having more symptoms, they did not rate them high enough to warrant a DSM diagnosis (with the exception of an ASD diagnosis). Therefore, the higher level of symptoms may be capturing an overall increase in general problems including disruptive behavior, attentional control, impulsivity, and general anxiety in children with ASD. There has recently been an increased interest in psychiatric comorbidity in ASD. One study that compared clinic and community samples of children with and without ASD found that children with ASD had significantly higher rates of ADHD (38% vs. 7%) and anxiety disorders (39% vs 5%) in clinic versus community samples respectively (Mattila, Hurtig, Haapsamo, Jussila, Kuusikko-Gauffin, et al., 2010). Additionally, symptoms of psychopathology such as hyperactivity, anxiety, and depression have been shown to influence problem behavior and are difficult to diagnose in this population (Evans, Canavera, Lee Kleinpeter, Maccubbin, & Taga, 2005; White, Oswald,

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Ollendick, & Scahill, 2009). Children with ASD who experience comorbid psychological conditions might be at an even greater risk for exhibiting problem behavior due to the deficits in communication found in ASD. In future studies, both problem behavior and comorbid psychiatric symptoms should be assessed.

The next set of analyses focused on the relationship between child impact and the two relationship variables (i.e., parent alliance and marital satisfaction). As predicted, there was a significant negative relationship between child impact and both marital satisfaction and parenting alliance for mothers of children with ASD. The relationship was not significant for parents of TD children, which suggests a unique relationship between these variables for parents of children with ASD. For mothers of children with DS, child impact negatively predicted parent alliance, but did not predict marital satisfaction. These results suggest that the greater the negative impact of the child with DS, the more strained the parenting relationship. It also suggests that the marital relationship in mothers of children with DS may remain relatively intact such that parents are able to maintain overall satisfaction with their spouse despite lower agreement on parenting.

DS is the most common chromosomal cause of intellectual disability and is typically detected during pregnancy (Cohen, 2005). McCubbin and McCubbin (1993) defined Adaptation in their resiliency model of family stress as the ability for families to respond to major transitions and hardships. Several studies on parents of children with DS demonstrated that families are able to respond to the experience of raising a child with DS with resilience and adaptive functioning (Van Riper, 2007). One study on positive adjustments of parents of children with DS also showed that mothers and fathers are successfully able to adjust to the challenges of raising a child with DS (Flaherty & Glidden, 2000). Many studies have also shown that parents of children with DS report lower levels of stress compared to parents of children with ASD

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(Sanders & Morgan, 1997; Seltzer, Krauss, & Tsunematsu, 1993). Further, these parents report their children with DS to be more rewarding and express higher levels of gratification from parenting than parents of children with other DD (see review by Hodapp, Ly, Fidler, Ricci, 2001). While parents of children with DS experience greater family adaptation, the picture may be different for parents of children with ASD.

For mothers of children with ASD, negative child impact negatively predicted both parent alliance and marital satisfaction. Contrary to prediction, this relationship did not change when controlling for autism symptom severity. The negative impact of children with ASD on the family may indeed spillover to parents' relationship satisfaction as well as their agreement on parenting. The results herein further explain how children with ASD may impact family adaptation in multiple ways through financial strain, difficulty with sibling relationships, parents' social isolation, reduced co-parenting agreement, and marital satisfaction. These impacts may also explain part of the reason for the increased stress in parents of children with ASD shown across multiple studies.

Children with ASD may indeed have a negative impact on various aspects of family functioning and parenting relationships; however, it is important to note that parents may vary in their ability to cope with the child's diagnosis and subsequent challenges (Bayat, 2007). It is important to emphasize that this study does not include measures of resiliency or family coping. Therefore, specific conclusions about adaptive family functioning cannot be made. Future research should include a measure of family adaptation to determine how familial coping mediates the relationship between child impact and parent relationships.

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Clinical Considerations

An area that has extensive evidence on outcomes for children with ASD and their families is Positive Behavior Support (PBS), which is a systems approach to treatment for people with DD that can be applied in the home, school, and community. PBS involves preventative, functional, and comprehensive research-based interventions that combine valued outcomes, behavioral and biomedical science, skills training, and systems change (Carr, 2007). The goal of PBS is to enhance quality of life (QOL) for individuals and their families (Carr, Horner, Turnbull, Marquis, Magito-McLaughlin, et al., 1999), but the success of behavioral interventions are often compromised due to marital discord, increased stress, and lack of social support (Baker, Landen, & Kashima, 1991).

This study further supports the importance of including parents (and the family) in treatment for children with ASD. Children with ASD clearly impact several main areas of functioning for the family. While certain aspects of the challenges involved in raising a child with ASD may not change (e.g., financial support), other aspects may be possible to change. For example, parents may be able to improve their perceptions about their child. Negative perceptions or schemas have been shown to relate to overall stress levels and negative parent-child interaction patterns (Webster-Stratton, 1990). In addition, parental attributional style significantly contributes to the success or failure of parent training (Solish & Perry, 2008; Wittingham, Sofronoff, Sheffield, & Sanders, 2009). In the current study, parents in the ASD group reported greater overall negative perceptions including less parent efficacy and less enjoyment in parenting. These results suggest that it is critical to target parents' perceptions within the context of interventions.

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There are several recent studies that have focused on improving parent attributional style and parenting perceptions while also providing traditional PBS interventions to improve child problem behavior (Durand, Hieneman, Clarke, Wang, & Rinaldi, 2013; Durand, Hieneman, Clarke, & Zona, 2009). Specifically, parents received “Positive Family Intervention (PFI),” which not only addressed child problem behavior using PBS, but also targeted parent’s negative thoughts and feelings associated with their child’s behavior by teaching parents cognitive restructuring techniques to help challenge negative thoughts and develop positive self-talk (Durand et al., 2013). Results showed that the inclusion of PFI in a treatment as usual for children with ASD, significantly improved the child’s problem behaviors over and above treatment without PFI (PBS alone). This further suggests that parent perceptions and parents’ self-efficacy should be assessed before a treatment course is decided upon. If parents display negative perceptions about their child or their effectiveness as a parent, it may be important to target these beliefs through the use of cognitive-behavioral strategies in addition to behavioral interventions for the child. Interventions such as cognitive restructuring have been shown to decrease parental pessimism and may further improve success in parent training interventions (Durand et al., 2013).

Another important clinical consideration is the ability to provide parents with psychoeducation about the potential impact of having a child with a DD, particularly ASD, on their marriage and co-parenting relationship. Given the results from this study, children with ASD impact multiple areas of functioning for the family. Parents may benefit from preventative feedback about these impacts at the time the child is diagnosed or shortly after. Clinicians who are providing assessment and treatment to these families should provide families information and resources that can directly help some of the impact areas assessed in this study. Examples of

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important resources may include respite services, parent support groups, sibling groups, and autism foundations that may assist the family financially. Additionally, there is a lack of research on interventions that specifically target the parent alliance. Traditional parent management training or couple's therapy may improve the parent alliance, however research is needed to determine the impact of these treatments on the co-parenting relationship.

On a policy level, knowing that the financial impact of having a child with ASD is so high, it is important to continue working to improve insurance coverage for evidence-based treatments for children with ASD and their families. It is also important to continue enhancing accessibility of treatment for these families. Providers across disciplines should be able to provide families with information regarding evidence-based treatments for children with ASD as well as family resources that can help build family adaptation and cohesion, such as autism friendly events.

Limitations and Future Research

This study includes a large sample of mothers and is the first study to compare parents of children with ASD, DS, and TD children on measures related to child impact as well as parental relationships. All of the measures in the study have been widely used and normed on parents with children across the three diagnostic groups. The sample is comprised of mostly Caucasian, upper-middle class mothers, therefore the results herein may be conservative estimates of the level of impact children with ASD have on families. It is important that future studies attempt to recruit samples that span the range of socioeconomic status (SES). There are several limitations, however, that limit generalization and interpretation of the results. First, this is a community-based sample of mothers who were recruited online. Child diagnosis was identified based on parent-report only and diagnostic confirmation is necessary in order to confirm a diagnosis of

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ASD or DS. Additionally, all data is based on parent-report, which requires subjective judgment by the mother in order to recall her child's specific behaviors; there were no direct observation of the child's behavior or of the parents' relationship with their child or of the parents' marital quality. Within the current sample, there were also low levels of child symptomatology reported, which were based solely on parent report. In order to better understand the relationship between comorbid conditions and child impact, it is important to use multiple types of assessments (e.g., clinical and structured interviews, questionnaires, direct observation). Further, comorbidity in ASD is just beginning to be understood. Future studies would benefit from assessment of comorbid symptomatology in a clinic sample of children with ASD.

Furthermore, data were collected cross-sectionally; therefore, it is difficult to draw causal conclusions about the relationship between child impact and parent relationship factors. In future research, data should be collected longitudinally to better understand the direction of the relationships between these variables.

Given the importance of understanding family functioning and adaptation, future studies should include an assessment of problem behaviors in order to determine how it relates to child impact as well as the co-parenting and marital relationship. It is also important to compare parents of children with ASD to other clinical samples (e.g., ADHD, OCD, ODD). Finally, there is extensive literature on the effect of parent training on child behavior; however, it remains unclear how parenting interventions influence the co-parenting and marital relationship. A future treatment study is warranted to help determine if parent training increases agreement on parenting and marital satisfaction. The study should specifically include a comparison between parent training and parent training plus couple's therapy.

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Conclusions

From a systems perspective, it is important to acknowledge the influence of having a child with ASD on multiple aspects of the family system. Parents of children with ASD report more negative impacts on financial stability, social life, sibling relationships, marital satisfaction, and parent alliance compared to parents of children with DS and TD children. Further, increased negative impact of the child with ASD directly relates to lower marital satisfaction and parent alliance. Taken together, the results of this study further speak to a need to provide interventions that address child as well as parent needs, with the main goal being to improve quality of life for the family.

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Table 1

Demographic Information by Diagnostic Group

<u>Demographic Category</u>	<u>Autism</u> n (% of sample)	<u>Down syndrome</u> n (% of sample)	<u>Typically Developing</u> n (% of sample)
Ethnicity			
Asian	3 (5.3)	2 (3.7)	3 (6.4)
Hispanic	8 (14)	3 (5.6)	6 (12.8)
Black	1 (1.8)	0	3 (6.4)
White	44 (77.2)	48 (88.9)	32 (68.1)
Other	0	1 (1.9)	3 (6.4)
Marital status			
Married	52 (91.2)	51 (94.4)	45 (95.7)
Living, non-married	3 (5.3)	1 (1.9)	1 (2.1)
Length of relationship			
Less than 2 years	0	0	1 (2.1)
2-4 Years	1 (1.8)	0	2 (4.3)
4-8 Years	11 (19.3)	14 (25.9)	10 (21.3)
8-10 Years	10 (17.5)	9 (16.7)	13 (27.7)
More than 10	34 (59.6)	31 (57.4)	21 (44.7)
Number of marriages			
1	47 (82.5)	44 (81.5)	42 (89.4)
2	7 (12.3)	9 (16.7)	2 (4.3)
3 or more	1 (1.8)	0	1 (2.1)
Education			
Less than HS	0	1 (1.9)	0
HS Diploma/GED	4 (7)	3 (5.6)	1 (2.1)
Some college	6 (10.5)	7 (13)	3 (6.4)
2-year college	8 (14)	3 (5.6)	1 (2.1)
4-year college	18 (31.6)	19 (35.2)	10 (21.3)
Master's degree	15 (26.3)	19 (35.2)	15 (31.9)
Doctoral degree	2 (3.5)	1 (1.9)	4 (8.5)
Professional degree	4 (7)	1 (1.9)	12 (25.5)
Household Income			
Less than \$10K	1 (1.8)	1 (1.9)	0
\$20K-\$29K	0	1 (1.9)	0
\$30K-\$39K	4 (7)	3 (5.6)	3 (6.4)

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\$40K-\$49K	2 (3.5)	4 (7.4)	1 (2.1)
\$50K-\$59K	6 (10.5)	2 (3.7)	2 (4.3)
\$60K-\$69K	2 (3.5)	2 (3.7)	2 (4.3)
\$70K-\$79K	7 (12.3)	10 (18.5)	4 (8.5)
\$80K-\$89K	4 (7)	3 (5.6)	2 (4.3)
\$90K-\$99K	9 (15.8)	3 (5.6)	0
\$100K-\$150K	11 (19.3)	16 (29.6)	16 (34)
\$150K or more	9 (15.8)	7 (13)	16 (34)
Number bio children			
1	16 (28.1)	9 (16.7)	10 (21.3)
2-3	36 (63.2)	34 (63)	33 (70.2)
4 or more	5 (8.8)	11 (20.4)	4 (8.5)
Children in household			
1	13 (22.8)	7 (13)	9 (19.1)
2-3	41 (71.9)	36 (66.7)	34 (72.3)
4 or more	3 (5.3)	11 (20.4)	4 (8.5)
Child sex			
Male	45 (78.9)	30 (55.6)	24 (51.1)
Female	11 (19.3)	24 (44.4)	22 (46.8)

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Table 2

Reliability for Main Study Measures by Diagnostic Group

	<u>Autism</u>	<u>Down syndrome</u>	<u>Typically Developing</u>
<u>Measure (# of items)</u>	Cronbach's Alpha	Cronbach's Alpha	Cronbach's Alpha
Family Impact Questionnaire (FIQ)			
Total Negative (7)	.79	.64	.79
Total Positive (8)	.80	.79	.85
Social Impact (10)	.89	.89	.68
Financial Impact (7)	.88	.87	.90
Sibling Impact (9)	.74	.46	.73
Parenting Alliance (PAI) (20)	.97	.94	.97
Marital Relationship (DAS)			
Agreement (3)	.83	.67	.87
Cohesion (3)	.89	.78	.87
Satisfaction (6)	.89	.73	.88
Symptom Severity (CSI-4)			
ADHD-I (9)	.90	.89	.88
ADHD-H (9)	.75	.79	.82
ODD (8)	.84	.65	.84
GAD (7)	.85	.68	.74
OCD (2)	.48	.07	.18
TICS (2)	.69	.60	.88
Autism (12)	.85	.88	.50
Social Phobia (4)	.61	.26	.35
SAD (8)	.87	.79	.37

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Table 3

Bivariate Correlations Among All Full Scale and Subscale Measures

	1	2	3	4	5	6	7	8
1. FIQ-Negative Feelings	–	-.56**	.72**	.57**	.74**	-.46**	-.33**	-.29**
2. FIQ-Positive Feelings		–	-.56**	-.28**	-.31**	.33**	.19*	.23**
3. FIQ-Social Impact			–	.56**	.56**	-.44**	-.32**	-.23**
4. FIQ-Financial Impact				–	.47**	-.39**	-.24**	-.22**
5. FIQ-Sibling Impact					–	-.35**	-.29**	-.28**
6. PAM-Parenting Alliance						–	.74**	.67**
7. DAS-Agreement							–	.60**
8. DAS-Cohesion								–

Note: * $p \leq .05$, ** $p \leq .01$

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Table 4

Descriptive Statistics for all Main Variables by Diagnostic Group

<u>Measure</u>	<u>Autism</u>		<u>Down syndrome</u>		<u>Typically Developing</u>	
	Mean	SD	Mean	SD	Mean	SD
Family Impact Questionnaire (FIQ)						
Total Negative	1.48	.64	.69	.39	.65	.51
Total Positive		1.25		1.80		1.97
Social Impact		1.50		.42		.14
Financial Impact	1.61	.86	.85	.73	.47	.60
Sibling Impact	1.01	.53	.58	.31	.35	.34
Parenting Alliance (PAI)	3.58	.99	4.43	.52	4.29	.69
Marital Relationship (DAS)						
Agreement	3.17	.11	3.75	.11	3.82	.13
Cohesion	2.61	.16	3.12	.16	2.99	.18
Satisfaction	2.61	1.58	3.80	1.22	3.51	1.49
Total DAS	17.63	6.28	20.29	3.64	20.24	5.80
Symptom Severity (CSI-4)						
ADHD-I	1.99	.61	1.37	.56	.59	.45
ADHD-H	1.63	.55	1.00	.48	.70	.59
ODD	.96	.62	.50	.26	.50	.41
GAD	.97	.71	.28	.32	.36	.38
OCD	.90	.83	.15	.35	.24	.38
Autism	1.81	.58	.72	.56	.06	.09
Social Phobia		1.40		.92		.79
SAD	.48	.56	.20	.38	.17	.18

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Table 5

Summary of Significant Effects from Multivariate Analyses

Measure	Diagnostic Group (<i>M</i> , <i>SE</i>)	Contrast (<i>M</i> difference, <i>SE</i>)	<i>p</i> -value (contrast)
<i>FIQ-Negative Impact</i>	Autism Spectrum (ASD) (<i>M</i> = 1.48, <i>SE</i> = .08)	ASD – DS (<i>M</i> = .77, <i>SE</i> = .11)	<.001
	Down syndrome (DS) (<i>M</i> = .71, <i>SE</i> = .08)	DS – TD (<i>M</i> = .08, <i>SE</i> = .12)	.471
	Typically Developing (TD) (<i>M</i> = .63, <i>SE</i> = .09)	TD – ASD (<i>M</i> = -.86, <i>SE</i> = .12)	<.001
<i>FIQ-Positive Impact</i>	Autism Spectrum (ASD) (<i>M</i> = 1.23, <i>SE</i> = .08)	ASD – DS (<i>M</i> = -.56, <i>SE</i> = .12)	<.001
	Down syndrome (DS) (<i>M</i> = 1.79, <i>SE</i> = .08)	DS – TD (<i>M</i> = -.21, <i>SE</i> = .13)	.090
	Typically Developing (TD) (<i>M</i> = 2.00, <i>SE</i> = .09)	TD – ASD (<i>M</i> = .78, <i>SE</i> = .13)	<.001
<i>FIQ-Social Impact</i>	Autism Spectrum (ASD) (<i>M</i> = 1.48, <i>SE</i> = .08)	ASD – DS (<i>M</i> = 1.06, <i>SE</i> = .11)	<.001
	Down syndrome (DS) (<i>M</i> = .43, <i>SE</i> = .08)	DS – TD (<i>M</i> = .28, <i>SE</i> = .12)	.021
	Typically Developing (TD) (<i>M</i> = .15, <i>SE</i> = .09)	TD – ASD (<i>M</i> = -1.34, <i>SE</i> = .12)	<.001
<i>FIQ-Financial Impact</i>	Autism Spectrum (ASD) (<i>M</i> = 1.56, <i>SE</i> = .11)	ASD – DS (<i>M</i> = .71, <i>SE</i> = .15)	<.001
	Down syndrome (DS) (<i>M</i> = .84, <i>SE</i> = .11)	DS – TD (<i>M</i> = .28, <i>SE</i> = .16)	.084
	Typically Developing (TD) (<i>M</i> = .56, <i>SE</i> = .12)	TD – ASD (<i>M</i> = -.99, <i>SE</i> = .17)	<.001
<i>FIQ-Sibling Impact</i>	Autism Spectrum (ASD) (<i>M</i> = .99, <i>SE</i> = .06)	ASD – DS (<i>M</i> = .42, <i>SE</i> = .09)	<.001
	Down syndrome (DS) (<i>M</i> = .57, <i>SE</i> = .06)	DS – TD (<i>M</i> = .18, <i>SE</i> = .09)	.050
	Typically Developing (TD) (<i>M</i> = .39, <i>SE</i> = .07)	TD – ASD (<i>M</i> = -.60, <i>SE</i> = .09)	<.001

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Measure	Diagnostic Group (<i>M</i> , <i>SE</i>)	Contrast (<i>M</i> difference, <i>SE</i>)	<i>p</i> -value (contrast)
<i>DAS-Agreement</i>	Autism Spectrum (ASD) (<i>M</i> = 3.17, <i>SE</i> = .11)	ASD – DS (<i>M</i> = -.58, <i>SE</i> = .16)	<.001
	Down syndrome (DS) (<i>M</i> = 3.75, <i>SE</i> = .11)	DS – TD (<i>M</i> = -.07, <i>SE</i> = .17)	.687
	Typically Developing (TD) (<i>M</i> = 3.82, <i>SE</i> = .13)	TD – ASD (<i>M</i> = .65, <i>SE</i> = .18)	<.001
<i>DAS-Cohesion</i>	Autism Spectrum (ASD) (<i>M</i> = 2.61, <i>SE</i> = .16)	ASD – DS (<i>M</i> = .51, <i>SE</i> = .23)	.028
	Down syndrome (DS) (<i>M</i> = 3.12, <i>SE</i> = .16)	DS – TD (<i>M</i> = .13, <i>SE</i> = .25)	.614
	Typically Developing (TD) (<i>M</i> = 2.99, <i>SE</i> = .18)	TD – ASD (<i>M</i> = .38, <i>SE</i> = .25)	.133
<i>PAM-Total</i>	Autism Spectrum (ASD) (<i>M</i> = 3.57, <i>SE</i> = .11)	ASD – DS (<i>M</i> = -.87, <i>SE</i> = .15)	<.001
	Down syndrome (DS) (<i>M</i> = 4.44, <i>SE</i> = .11)	DS – TD (<i>M</i> = .16, <i>SE</i> = .16)	.335
	Typically Developing (TD) (<i>M</i> = 4.29, <i>SE</i> = .12)	TD – ASD (<i>M</i> = .72, <i>SE</i> = .17)	<.001

Note: Significant contrasts have been bolded.

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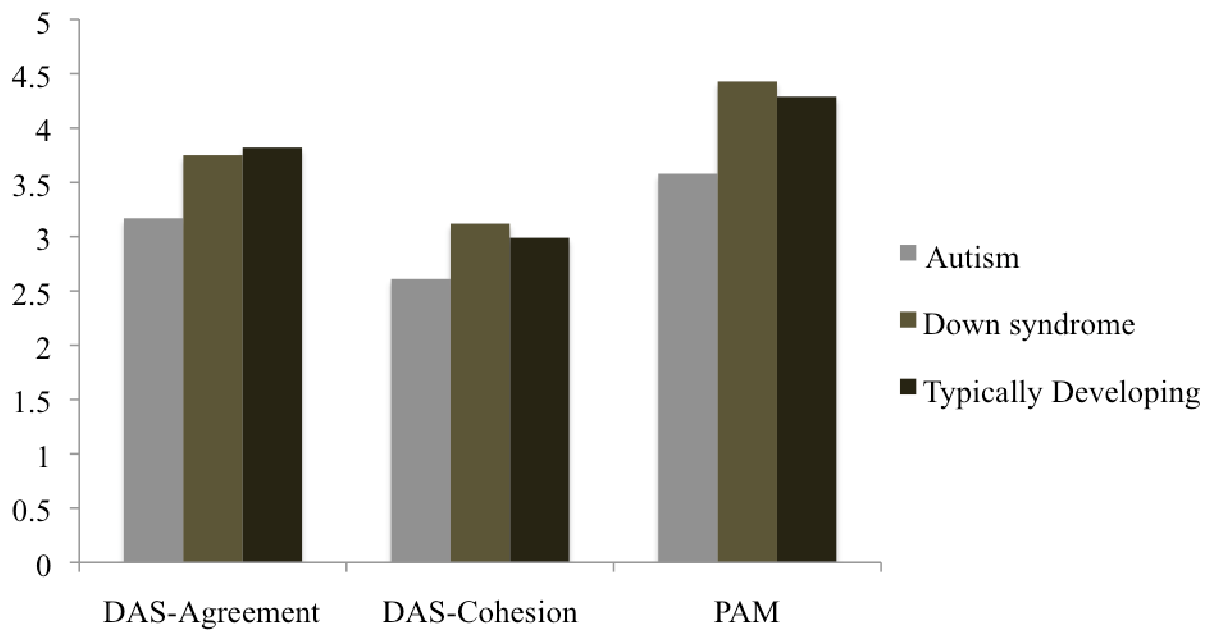


Figure 1. Comparison of Marital and Parenting Alliance Variables by Diagnostic Group