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Predictors of Parent Expectations within an Intervention for Children with Autism

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

by

Lindsay Gail Hauptman

2017

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ABSTRACT OF THE THESIS

Predictors of Parent Expectations within an Intervention for Children with Autism

by

Lindsay Gail Hauptman

Master of Arts in Education

University of California, Los Angeles, 2017

Professor Connie L. Kasari, Chair

Parent expectations regarding autism spectrum disorder therapies can affect treatment session adherence and attendance. This study explored whether family characteristics were associated with parent expectations of belief in child improvement (BCI) and treatment credibility (TC). Participants included 94 parents who completed the Parent Expectancies Questionnaire (PEQ) at entry of a 12-week intervention study. The association between family characteristics and BCI and TC were evaluated using multiple linear regression and logistic regression, respectively. Results indicated that African American and multi-ethnic/other participants rated higher BCI relative to White participants. Both socioeconomic status (SES) and previous intervention experience were negatively related to BCI. No variables related to TC. Overall, participants' optimism regarding BCI varied by race/ethnicity, SES, and previous interventions.

The thesis of Lindsay Gail Hauptman is approved.

Sandra H. Graham

Jennie Katherine Grammer

Connie L. Kasari, Committee Chair

University of California, Los Angeles

2017

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Predictors of Parent Expectations within an Intervention for Children with Autism

Autism spectrum disorder (ASD) is a developmental disorder that affects 1 in 68 children in the United States (Centers for Disease Control and Prevention [CDC], 2014), and is characterized by symptoms of restricted and repetitive behavior and impairments in social communication (American Psychiatric Association [APA], 2013). The rapidly increasing rate of diagnosis of this disorder impacts families of different cultures, ethnicities, and social classes (CDC, 2014). Currently, there are many treatment options that aim to help families improve the lives of their children with ASD (Goin-Kochel, Myers, & Mackintosh, 2007). Families enter these treatments with expectations of what the treatment is going to be like and the gains that their child could make. In turn, these expectations could influence how involved caregivers are during the treatment sessions, including whether or not they actually attend the treatment sessions (Nock & Kazdin, 2001). Within ASD research, little is known about what influences parents' expectations, specifically regarding how certain family characteristics relate to caregivers' expectations as they begin a new ASD intervention.

Parent Involvement in ASD Interventions

Parent training programs in which parents deliver the intervention to their children can improve child outcomes (Kasari, Gulsrud, Wong, Kwon, & Locke, 2010; Kashinath, Woods, & Goldstein, 2006; Moran & Whitman, 1991). Involved parents can also help children with ASD generalize skills learned in therapy sessions or schools (Matson, Mahan, & Matson, 2009; Wetherby et al., 2014). However, one factor that may affect intervention success is the extent to which parents accept or buy into the intervention (Moes & Frea, 2000). Lack of acceptability may result in less parent involvement and follow-through (Bernheimer & Keogh, 1995; Gopalan et al., 2010; Matson et al., 2009; Moes & Frea, 2000), thereby affecting treatment effectiveness.

Parent Attendance and Adherence to Treatment

Both parent attendance to treatment sessions and adherence to treatment training are challenges researchers must tackle in intervention research (Gopalan et al., 2010; Moore & Symons, 2009). The success of an intervention is often dependent on dose, or intensity and frequency of intervention sessions (Gulsrud, Helleman, Shire, & Kasari, 2016; Kasari et al., 2005). Dropping out of a treatment early or not following the instructions of a health care provider or therapist could mean that the family would not benefit from the treatment as much as they would have if the family had continued with that treatment (Moore & Symons, 2009). Similarly, attending sessions but not adhering to the treatment can also impact the effectiveness of the treatment. Depending on the intervention delivery model, parents must make sure that either their child, or both parent and child, attend intervention sessions. However, many parents leave interventions early and do not obtain the recommended number of sessions (Gopalan et al., 2010; Nock & Kazdin, 2001). For instance, a meta-analysis of outpatient cognitive behavior therapy found that 26.20% of participants (both adults and adolescents) dropped out during the therapy (Fernandez, Salem, Swift, & Ramtahal, 2015). Understanding the factors associated with poor attendance and adherence are necessary in order to improve intervention delivery and intended outcomes.

Treatment characteristics, such as randomized treatment condition or treatment site location, as well as family characteristics, such as socioeconomic status (SES), can influence a family's adherence and attendance in treatment (Carr et al., 2015). An increased number of barriers to treatment including low SES, high symptom severity, and ethnic minority status affect treatment adherence, presumably due to family and treatment fit (Carr et al., 2015; Kazdin, Holland, & Crowley, 1997; Snell-Johns, Mendez, & Smith, 2004). Caregiver satisfaction

regarding services could also impact parent adherence (Geffken, Keeley, Kellison, Storch, & Rodrigue, 2006).

One specific factor that may affect parent attendance of treatment sessions and adherence to treatment instructions may be the parent's expectations for what they believe the intervention will accomplish. When expectations are high, parents have greater belief in the credibility of the therapy, and these beliefs, in turn, predict higher rates of adherence to the treatment (Nock, Ferriter, & Holmberg, 2006). Conversely, parent perceptions of an irrelevant treatment or a poor therapeutic alliance predict an increased likelihood in discontinuing therapy (Kazdin et al., 1997). Variations in parents' expectations are part of a constellation of characteristics with which families enter treatment.

Parent Expectations

Understanding parent expectations may be especially relevant in order to understand parent involvement in ASD treatment. Since young children spend most of their time with parents, parent training is a logical and commonly used strategy within ASD interventions (Kasari et al., 2010). Parents are also generally responsible for selecting an intervention for their child, as well as providing transportation to those interventions (Nock et al., 2006). Therefore, parent expectations could influence both parent and child involvement in interventions greatly. However, despite the potentially large role of parents in interventions (Kasari et al., 2010; Kashinath et al., 2006; Moran & Whitman, 1991) a gap remains in the literature regarding parent expectations in ASD specific interventions

Parent expectations have been found to be a nuanced concept. Nock and Kazdin (2001) determined that their parent expectancies questionnaire divided into three factors, including belief in child improvement (BCI), treatment credibility (TC), and parent involvement (PI),

indicating the relevance of different aspects within the broader “expectations” term.

Additionally, each factor was found to relate to certain variables, such as low SES relating to low TC, or high levels of parent stress and higher child dysfunction associated with low BCI (Nock & Kazdin, 2001). These relations may be especially relevant within the field of ASD, as, for example, parents of children with ASD tend to have higher stress levels than parents of other children (Baker-Ericzén, Brookman-Frazee, & Stahmer, 2005; Sanders & Morgan, 1997).

Current Study

The purpose of this study was to investigate how family characteristics (e.g. previous use of ASD interventions), as well as child characteristics (e.g., ASD symptom severity), are related to parent expectations of belief in child improvement (BCI) and treatment credibility (TC) in a multi-site parent mediated intervention study for preschoolers with ASD.

Research Question and Hypotheses

To address the gap in the literature regarding parent expectations of treatment effectiveness within autism interventions, this study aimed to examine how child characteristics (i.e., SES, ethnicity, previous intervention experience, and child severity of ASD symptoms) relate to a parent’s BCI and TC expectations. Interactions between variables were examined (Carr et al., 2015; Mandell & Novak, 2005; Mandell, Novak, & Zubritsky, 2005; Zuckerman et al., 2014).

A number of predictions were made including a) higher SES would be positively relate to BCI and TC expectations, while severity of symptoms and early intervention experience would negatively relate to BCI and TC expectations, b) White parents were predicted to have higher BCI and TC expectations than non-White participants (Nock & Kazdin, 2001), c) ADOS Calibrated Severity Scores (ACSS) and Parent Daily Hassles scores (PDH) would be negatively

related to BCI and TC, whereas the Mullen Scales of Early Learning Nonverbal Developmental Quotient would be positively related to BCI and TC (Nock & Kazdin, 2001), d) families with high SES would have higher BCI and TC in White families than in non-White families, and e) that families that did have previous intervention experience would have lower BCI and TC in White families than in non-White families.

Method

This study is a secondary analysis using data from parents of children with ASD who participated in a multi-site intervention study for children with ASD (Kasari et al., 2014). The randomized-controlled trial compared two parent-based ASD interventions—a caregiver-mediated module (CMM; JASPER hands on parent mediated intervention) and a caregiver education module (CEM; group meetings with the interventionist and parents without the child delivering similar communication and behavioral information)—within low-resourced communities. Participants were randomized into either the CMM group or CEM group.

Participants

This study recruited young children (N = 147) with ASD and their caregivers from the 5 study sites across the country. Caregivers gave consent before starting the treatment. The intervention study was conducted at each site, and lasted from 2009 to 2011. Local Institutional Review Boards for each site approved the study. Inclusion criteria included that children had few if any autism specific early interventions, and families had few resources due to unemployment of the primary caregiver, the family was receiving federal assistance or that the family was classified as low income according to the U.S. Department of Housing and Urban Development (Kasari et al., 2014). Children could not be diagnosed with genetic or physical disabilities,

needed to have Mullen mental age of at least 12 months, and had to have been diagnosed with ASD (Kasari et al, 2014).

To be included in the present study, parents completed the Parent Expectancies Questionnaire (PEQ; Kasari et al., 2014, adapted for this study from Nock & Kazdin, 2001). This yielded a sample of N=113 children 2 to 5 years old. Because listwise deletion was utilized and participants had to answer at least 90% of the PEQ questions to be included, this yielded a sample of 94 for BCI scores and 92 for TC scores (Bennett, 2001). Of the 94 total participants, there were 82 boys and 12 girls. Caregivers (i.e., parent expectancy raters) were 81.9% mothers, 12.8% fathers, and 5.3% other caregivers. Caregivers identified their child's ethnicity as White (34%), Asian (9.60%), African American (23.40%), Hispanic (14.90%), or mixed/other (18.10%). SES scores were calculated using Hollingshead Index of Social Position (Carr et al., 2015; Hollingshead, 1957; Hollingshead, 1975), and participants' scores ranged from 16.5 to 66. Other demographic characteristics are reported in Table 1.

Measures

Autism Diagnostic Observation Schedule. The Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000) is a semi-structured standardized diagnostic assessment. It is used to measure ASD symptoms within areas such as language, play, and communication. From ADOS raw scores, ADOS Calibrated Severity Scores (ACSS; Gotham, Pickles, & Lord, 2008) were ascertained to measure severity of autism symptoms among participants on a scale of 1 to 10, where 10 indicated severe ASD symptoms and 1 indicated low ASD symptoms (Gotham et al., 2008).

Demographics. Demographic information was collected at entry, including information about parental occupation, child gender, child race/ethnicity (choosing from White, Asian,

African American, Native American, Hispanic, Pacific Islander, and Other), and parent education (ranging from “less than 12th grade” to “graduate degree”). In addition, parents reported on experience with previous interventions, which was indicated with a “yes” or “no”. Therefore, previous intervention experience was quantified in this study as a dichotomous variable. Although type of services and hours per week in the last year were also collected on the demographics form, hours per intervention type were not specified. Additionally, information about quality of services and parent satisfaction were not collected. There was also no indication when the services received in the last year began or ended.

Family SES was calculated using the Hollingshead Index of Social Position (Carr et al., 2015; Hollingshead, 1957; Hollingshead, 1975), in which parent occupations and parent education levels were given scores. Occupation scores were given a weight of 5, and education level is given a weight of 3. These weighted scores were then added together. Two-parent household scores were calculated by averaging both parents’ scores. Higher SES scores indicate higher SES, with a possible range of scores from 8 to 66.

Mullen Scales of Early Learning. The Mullen Scales of Early Learning (Mullen, 1995) is a standardized assessment that measures gross motor, visual reception, fine motor, expressive language, and receptive language in young children. The Mullen was conducted before treatment and the Mullen Nonverbal Developmental Quotient (Mullen NVDQ) was used to quantify cognitive ability for each child.

Parenting Daily Hassles. The Parenting Daily Hassles (PDH) (Crnic & Booth, 1991) is a caregiver self-report questionnaire that measures daily child-related hassles in a caregiver’s life in both the frequency and the intensity of those hassles ($\alpha_{total} = .94$, $\alpha_{frequency} = .88$, $\alpha_{intensity} = .90$). The survey is comprised of 20 questions assessing “parenting events” such as “continually

cleaning up messes of toys or food” or “the kids demand that you entertain or play with them”. Parents rate frequency for each event on a 5-point scale from 0 (“never”) to 4 (“constantly”). Parents also rate intensity of hassles for each event on a 5-point scale from 1 (“no hassle”) to 5 (“big hassle”). The scale yields two subscales, one being a total frequency score, and one being a total intensity score (Crnic & Booth, 1991). Only the total frequency score for each participant (Crnic & Booth, 1991; Crnic & Greenberg, 1990) was used for the PDH measure because of the high correlation between frequency and intensity PDH scores ($r = .82, p = .000$), where 80 = constantly experiencing hassles and 0 = never experience hassles.

Parent Expectancies Questionnaire. The PEQ (Kasari et al., 2014, adapted for this study from Nock & Kazdin, 2001) is a caregiver questionnaire that assesses parent expectations on a 5-point scale, from 1 (“Disagree strongly”) to 5 (“Agree strongly”). The assessment is composed of 18 items that measure parent expectations regarding treatment (e.g., “I believe that my child will improve quickly”, “I believe this treatment will be worthwhile”). Data for this assessment was collected at the entry timepoint.

Two outcome variables were derived based on factor analyses (Toolan et al., 2017) including: (a) belief in child improvement (BCI) including 3 items (e.g., “I believe my child will improve quickly”; $\alpha = .70$), and (b) treatment credibility (TC) including 8 items (e.g., “I believe the therapy described will be worthwhile”; $\alpha = .76$). Mean scores were used for both BCI and TC where a score of 5 reflects expectations for timely child improvement (BCI) and the treatment will lead to gains for my child (TC), respectively, while 1 refers to no expectation that my child can improve (BCI) and the belief that the treatment will not lead to gains for my child (TC), respectively.

Procedure

At baseline, children were assessed using the ADOS and the Mullen to determine eligibility. Caregivers consented, and were informed via the consent form that they would be randomized into two groups. Caregivers completed a demographics questionnaire, which was used to determine eligibility based on SES. Additionally, caregivers were given the PEQ before treatments began.

Data Analysis

Descriptive statistics were examined and variables were checked for violations of assumptions for child and family characteristics and PEQ subscale scores. Correlations were run between continuous variables (BCI, TC, SES, and ACSS) to assess their relationship. One-way ANOVAs were run to determine the relationship between ethnicity and previous intervention hours, ethnicity and SES, and site and SES. Kruskal-Wallis tests were run to determine the relationship between site and ACSS, and ethnicity and ACSS. Fisher's Exact tests were conducted to determine the relationship between categorical variables, such as between site and ethnicity, and site and previous intervention experience as a dichotomous variable. For the site/ethnicity descriptive Fisher's Exact test, ethnicity was collapsed into White/Non-White because expected values were too small. Individual BCI and TC mean scores were calculated.

Multiple linear regression was used to determine which variables significantly explained BCI scores. Because the TC mean scores were negatively skewed and violated the assumption of normality, logistic regression was used for analysis as it does not have the same normality requirement as a linear regression (Peng, Lee, & Ingersoll, 2002). The TC mean sum score from Nock and Kazdin's (2001) original article was used as the cut-off score for the "high TC" and "low TC" groups in the logistic regression. However, because fewer questions were used in

adapted version of the PEQ used in the present study, the mean sum score was adjusted to represent the same proportional score for the amount of questions in the adapted PEQ. Specifically, the mean sum score for the full 13 question PEQ was 56.98. Therefore, for 8 questions, the proportional derived mean sum score was 35.06. To derive the item mean score, 35.06 was divided by 8 (i.e., the total number of items in the adapted PEQ. “Low” scores were determined to be below 4.38, and “high” scores were above 4.39.

Because of the parallels of this study to Nock and Kazdin’s (2001) original study, predictors of both the multiple linear and logistic regression models were grouped into categories of family, child, and parent characteristics. These categories were then entered in the model in blocks (Nock et al., 2006; Nock & Kazdin, 2001). Specifically, initial models included variables we initially controlled for (site, child gender, and randomized condition), followed by family characteristics, then child characteristics, parents’ characteristics, and their interactions. Interactions between SES and ethnicity as well as ethnicity and early intervention experience were examined in both the BCI mean score multiple regression model and TC mean score logistic regression model. Listwise deletion was used to account for missing data among participants, and participants who answered fewer than 90% of expectation questions were excluded (Bennett, 2001).

Results

Descriptive Data

Table 1 shows descriptive statistics for family characteristics of participants.

Table 2
Family Descriptive Characteristics at Baseline

Variable	N (%)
Treatment Condition	
Caregiver Education Module	40 (42.60%)
Caregiver-Mediated Module	54 (57.40%)

Child gender	
Male	82 (87.20%)
Female	12 (12.80%)
Ethnicity	
White	32 (34%)
Asian	9 (9.60%)
African American	22 (23.40%)
Hispanic	14 (14.90%)
Mixed/Other	17 (18.10%)
SES Score: mean (SD)	38.99 (14.00)
ACSS: mean (SD)	7.45 (2.01)
Mullen NVDQ: mean (SD)	66.33 (21.50)
PDH: mean (SD)	43.67 (13.06)
Previous intervention experience	
No	17 (18.10%)
Yes	77 (81.90%)
Hours: mean (SD)	5.68 (8.25%)
Previous intervention services	
Applied behavior analysis	6 (4.20%)
Occupational therapy	26 (18.18%)
Speech therapy	43 (30.07%)
Physical therapy	4 (2.80%)
Play-based therapy	2 (1.40%)
Social skills	1 (0.70%)
Alternative therapy	2 (1.40%)
Comprehensive education	52 (36.36%)
Brief education	3 (2.10%)
Other/unknown	4 (2.80%)

Note: “Hours” refers to hours of services per week in the last year.

The number of hours of early intervention services per week in the last year ranged from 0 to 35 hours, with the majority of participants (74.10%) having received 5 hours or less of intervention per week. Ethnicities did not differ by early intervention hours per week, $F(4, 80) = 0.70, p = .591$. Types of intervention services (see Table 1) included applied behavior analysis (ABA), occupational therapy, speech therapy, physical therapy, play-based therapy, alternative therapy (e.g., music therapy), comprehensive education (e.g., head start), brief education (e.g., mommy and me), and other/unknown services.

Sites did not differ by SES values, $F(4, 89) = 0.37, p = .831$, or by ACSS, $\chi^2(4) = 6.42, p = .170$. There was a significant difference between site and ethnicity ($p = .004$), and site and previous intervention experience ($p = .019$).

There was no significant difference between ethnic groups by ACSS, $\chi^2(4) = 9.21, p = .056$, or between ethnic groups by previous intervention experience ($p = .236$). There were significant differences between ethnic groups by SES, $F(4, 89) = 5.53, p = .001$. Specifically, significant SES score differences were found via a Scheffé post hoc analysis between White participants ($M = 43.73, SD = 11.60$) and African American participants ($M = 31.84, SD = 13.91, p = .030$), with White participants having significant higher SES scores. There were also significant differences found between Asian participants ($M = 50.28, SD = 11.10$) and African American participants ($M = 31.84, SD = 13.91, p = .014$), as well as between Asian participants ($M = 50.28, SD = 11.10$) and Hispanic participants ($M = 32.25, SD = 15.05, p = .035$), with Asian participants having significantly higher SES scores than African American participants and Hispanic participants.

Pearson correlations were used to assess the relationship between continuous variables (see Table 2). There were no significant relationships between SES score and ACSS ($r = -0.15$), SES score and PDH score ($r = -0.12$), SES score and the Mullen NVDQ ($r = 0.19$), SES score and TC score ($r = -0.11$), ACSS and PDH score ($r = -0.01$), ACSS and BCI score ($r = -0.09$), ACSS and TC score ($r = -0.08$), PDH score and the Mullen NVDQ ($r = -0.01$), PDH score and BCI score ($r = -0.17$), PDH score and TC score ($r = -0.16$), the Mullen NVDQ and BCI score ($r = -0.10$), and the Mullen NVDQ and TC score ($r = 0.03$). There was a significant and negative relationship between ACSS and the Mullen NVDQ ($r = -0.47, p = .000$) and between SES score

and BCI score ($r = -0.23, p = .027$), and there was a significant and positive relationship between the two outcome measures— BCI score and TC score ($r = 0.40, p = .000$).

Table 2
Correlations between Independent and Dependent Variables at Baseline

Variable	1	2	3	4	5
1. SES score					
2. ACSS	-0.15				
3. PDH	-0.12	-0.01			
4. Mullen NVDQ	0.19	-0.47*	-0.02		
5. BCI	-0.23*	-0.07	-0.17	0.10	
6. TC	-0.11	-0.09	-0.16	0.03	0.40*

Note. Pearson correlations were used to compare continuous variables.

* $p < .05$

BCI Factor

The majority of participants had high mean BCI scores with a minimum score of 1.67 and a maximum score of 5 ($N = 94, M = 3.58, SD = 0.80$).

Predictors of BCI mean score. A full model was run to identify significant predictors, $R^2 = .43, F(23, 70) = 2.23, p = .004$. Site, $F(4, 70) = 2.77, p = .034$; ethnicity $F(4, 70) = 2.63, p = .041$; and SES scores, $F(1, 70) = 6.80, p = .011$, were found to be significant predictors. Treatment condition, $F(1, 70) = 0.06, p = .810$; child gender, $F(1, 70) = 0.00, p = .968$; early intervention experience, $F(1, 70) = 1.98, p = .164$; ACSS, $F(1, 70) = 0.05, p = .823$; PDH total frequency score, $F(1, 70) = 1.46, p = .230$; the Mullen NVDQ, $F(1, 70) = 2.95, p = .091$; ethnicity/SES interaction, $F(4, 70) = 1.30, p = .277$; and ethnicity/early intervention interaction, $F(4, 70) = 0.94, p = .448$, were not significant predictors. Interactions were excluded, as they were not found to contribute to the model.

The best fitting model (see Table 3) for explaining the BCI mean scores included randomized condition, child gender, site, ethnicity, SES, the Mullen NVDQ, ACSS, whether or not participants had early intervention experience, and PDH total frequency score, $R^2 = .35, F(15,$

78) = 2.81, $p = .002$. Early intervention experience was statistically significant, $F(1, 78) = 5.42$, $p = .023$. Specifically, early intervention experience was negatively related to BCI scores, $\beta = -0.25$, $t(78) = -2.33$, $p = .023$, where participants who had early intervention experience had significantly lower BCI scores than participants who did not have early intervention experience.

SES was statistically significant, $F(1, 78) = 4.25$, $p = .043$. SES scores were negatively related to BCI scores, $\beta = -0.22$, $t(78) = -2.06$, $p = .043$. Specifically, lower SES scores indicated higher BCI scores.

There were also BCI expectation differences among ethnicities, $F(4, 78) = 3.31$, $p = .015$. Specifically, when examining group differences, African American participants had significantly higher BCI expectations when compared to White participants, $\beta = 0.30$, $t(78) = 2.38$, $p = .020$, over and above the effect of the other included predictors. Participants categorized in the mixed/other group also had significantly higher BCI expectations when compared to White participants, $\beta = 0.41$, $t(78) = 3.41$, $p = .001$.

Table 3
Multiple Regression Analysis Predicting Parent BCI Factor Scores from Predictors

Predictor	<i>F</i>	<i>df</i>	<i>p</i>	η^2_p	<i>R</i> ²
Corrected Model	2.81	12	.002**	.35	.35
Intercept	38.08	1	.000**	.33	
Step 1					
Site	2.06	4	.095	.10	
Child gender	0.01	1	.934	.00	
Treatment condition	0.09	1	.769	.00	
Step 2					
Ethnicity	3.31	4	.015*	.15	
SES score	4.25	1	.043*	.05	
Step 3					
ACSS	0.78	1	.381	.01	
Mullen NVDQ	2.47	1	.120	.03	
Step 4					
Intervention experience	5.42	1	.023*	.07	
PDH	2.64	1	.108	.03	

* $p < .05$ ** $p \leq .01$

TC Factor

The majority of participants had high mean TC scores with a minimum score of 3 and a maximum score of 5 ($N = 92$, $M = 4.54$, $SD = 0.45$).

Predictors of TC mean score. A full model was run to rule out insignificant predictors, $\chi^2(23) = 31.46$, $p = .112$. There were no significant predictors in this model, including site ($\chi^2 = 4.13$, $p = .388$), child gender ($OR = 1.12$, $p = .898$), randomized condition ($OR = 0.40$, $p = .158$), SES ($OR = 0.97$, $p = .519$), ethnicity ($\chi^2 = 5.50$, $p = .239$), ACSS ($OR = 0.91$, $p = .634$), non-verbal IQ score ($OR = 0.99$, $p = .474$), early intervention experience ($OR = 0.23$, $p = .251$), PDH total frequency score ($OR = 0.98$, $p = .365$), ethnicity/SES interaction ($\chi^2 = 1.56$, $p = .817$), and ethnicity/early intervention interaction ($\chi^2 = 1.55$, $p = .817$).

Discussion

This study investigated possible predictors of parent expectations of an ASD intervention. Overall, while parents generally had high mean expectation scores in both factors, certain characteristics may have influenced parent BCI expectations. Specifically, both SES scores and early intervention experience were found to negatively relate to parents' expectations regarding BCI, and both African American participants and participants categorized in the mixed/other group had significantly higher expectations of BCI than White participants.

Previous Intervention Experience in Relation to BCI Expectation Scores

Previous intervention experience negatively relating to parents' BCI expectation scores draws attention to the challenges that parents of children with ASD may face regarding choosing interventions that are well-suited for their children. Parents' potential disappointment in relation to not seeing progress made during interventions (Grindle, Kovshoff, Hastings, & Remington, 2009), in this instance referring to past interventions, may also relate to the slightly lower

expectations that some parents with previous intervention experience reported. However, those previous experiences do not necessarily reflect the quality or effectiveness of a new and/or different intervention. Since expectations can be tied to parent involvement and buy in to treatment (Nock et al., 2006), understanding parents' experiences with past interventions could be one way that interventionists could bypass previously set expectations and work to improve parent buy in.

Race/Ethnicity in Relation to BCI Expectation Scores

Both African American participants and mixed/other participants had significantly higher BCI expectation scores than White participants, contrary to the hypothesis that non-White participants would have lower expectations than White participants. One reason for this could be that African American mothers may experience less of a negative impact on their lives in raising a child with ASD compared to White mothers (Bishop, Richler, Cain & Lord, 2007; Carr & Lord, 2013). A greater feeling of burden among mothers might influence other factors such as stress (Bishop et al., 2007), which could be tied to a more negative and hopeless perspective (Snyder, 2002), or lower expectations. Close ties within African American families and communities may decrease the amount of burden felt by those mothers, as they could feel more support from their community (Carr & Lord, 2013). These close ties and positive mentalities might also have impacted their BCI, perhaps one clue as to why African American parents had higher expectations than White parents in this factor. Future research should continue to recruit ethnically/racially diverse participants to further investigate possible similarities and differences across ethnicities/racial groups.

SES, Race/Ethnicity, and Diagnosis Rates in Relation to BCI Expectation Scores

Diagnosis rates could have played a role in both the race/ethnicity differences and SES differences in BCI expectation scores that were found. White children are diagnosed with ASD earlier and generally have more and better treatment opportunities (Liptak et al., 2008; Magaña et al., 2012; Mandell & Novak, 2005). Similarly, families with low SES often have fewer opportunities to access ASD services compared to families with high SES (Liptak et al., 2008). If African American participants, mixed/other participants, and participants with low SES had children diagnosed later than other participants, they might not be as jaded in the ASD intervention process as some parents might be. Therefore, it is possible that later diagnoses may be a factor to help explain participants' higher expectation scores related to the BCI for African American participants, mixed/other participants, as well as participants with lower SES.

SES, Race/Ethnicity, and Intervention Experience Interactions in Relation to BCI Expectation Scores

Although SES, race/ethnicity, and previous intervention experience each had significant relations with BCI, as well as with each other, they were not found to interact with each other in relation to BCI. More diverse samples pertaining to SES, race/ethnicity, as well as previous intervention experience may help to reveal possible existing interactions in the future.

Limitations and Future Directions

Lack of PEQ variability. Within each treatment condition in this study, elements of the intervention were individualized to increase the relevancy of treatment for families with low resources (Carr et al., 2015; Kasari et al., 2014). Starting the study with knowledge that parts of the intervention could be modified (via the consent form) might have impacted caregivers' expectation scores positively. Participants were also getting interventions at highly renowned autism centers with autism experts. Respect garnered from these institutions might have been at

least partially responsible for the high PEQ scores, and the lack of variability within the PEQ treatment credibility scores.

Nock and Kazdin (2001) found that low TC was associated with low SES and high rates of depression in parents. While SES was not significantly related to TC in this study, depression may be a future variable to investigate. Other factors such as previous intervention quality may relate to TC, as experience with higher quality interventions may make participants more optimistic about a future intervention's TC.

Social desirability. Social desirability, or wanting to be viewed in a positive light (Fisher, 1993), could be a possible confound responsible for high PEQ scores. Both PEQ factors' mean scores consisted of mostly high expectation scores, perhaps because participants felt the pressure of social desirability. A lack of variability among the high treatment credibility scores could have contributed to the non-significant results within the treatment credibility scores. Since social desirability may override honesty when participants are responding to questions, it is a factor to consider when examining these results.

Optimism about intervention. One limitation is that this group of participants may not include people who are truly pessimistic about this intervention. People who might not have joined this study because of low expectations for this intervention in the first place are missing from the analysis. People who are more skeptical of the treatment should also be recruited, if possible, to increase the heterogeneity in expectation scores. A greater number of participants would not only increase statistical power, but also would allow researchers to collect additional information on predictors of parent expectations regarding this intervention.

More information about intervention experience. Acquiring more comprehensive information regarding families' previous intervention experience could be another next step in

this research. A detailed source of what previous interventions families used, dosage of those interventions, and how satisfied caregivers were with those services could give researchers even more information regarding how interventions can influence parent expectations. If applicable, information about current interventions during the course of the study should also be collected. These potential active ingredients of interventions should be parsed out in future studies so they can be better understood (Kasari, 2002; Kasari et al., 2005).

Including more variables that could relate to expectations. Future studies could include additional variables of interest. For instance, a study could add parent levels of depression in addition to stress levels, as Nock and Kazdin (2001) did. Depression is often prevalent in the lives of parents of children with ASD (Benson, 2006), so this could also impact parent expectations. Another measure to include would be social desirability, which might impact how parents fill out expectations surveys—especially if they think it might affect their intervention or relationship with researchers. A future study could attempt to recruit even more low-resourced families and more racially/ethnically diverse families to continue to expand research on diverse families.

Expectations' relationship with child outcomes. Seeing how parents' expectations play a role in child outcomes, as well how parent expectations relate to attendance and parent adherence to treatment, would be another next step for research, as Nock and Kazdin (2001) found that expectations predicted other elements such as parent adherence for psychotherapy. Furthermore, because variables that were investigated in this study, such as site and treatment condition, were related to parent adherence in Carr et al.'s (2015) study, a future study that looks at the relationship between the predictor variables in this study, parent expectations, and parent adherence to treatment would be an important continuation of this research.

Implications

From this research, we can move forward to work with both parents and interventionists on ways to retain families in treatment, as understanding factors that may influence parents' expectations can inform support strategies needed for successful involvement in treatment. Studies should continue to individualize as much of the intervention as possible, especially if it could increase parent expectations. Because parent involvement and cooperation is very important for gains such as in generalization of skills and in behavioral outcome measures such as communication or joint attention (Kasari et al., 2010; Matson et al., 2009; Wetherby et al., 2014), it is imperative to continue to have both the parent and the interventionist working together (Moes & Frea, 2000).

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