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Predictors of Stress in Parents of Children with Fetal Alcohol Spectrum Disorders

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ABSTRACT. This study examined child characteristics and family factors as predictors of stress in the biological or adoptive parents of 6- to 12-year-old children with fetal alcohol spectrum disorders (FASDs). Impaired executive functioning, poorer adaptive functioning, externalizing and internalizing behavior problems, and adoptive parent status all made significant and independent contributions to the prediction of higher levels of child domain stress, as reported by parents on the Parenting Stress Index. Biological parent status and fewer family resources were associated with higher levels of parent domain stress. Teacher ratings of the child's executive functioning impairments and externalizing and internalizing behavior problems also were associated with parent reports of child domain stress. Findings highlight the need to provide support not only to children with FASDs, but to their caregivers as well. *J Dev Behav Pediatr 27:396–404, 2006.* Index terms: *fetal alcohol spectrum disorders, parenting stress, behavior problems, executive functioning.*

Fetal alcohol syndrome (FAS) is a preventable birth defect associated with prenatal alcohol use and defined by a characteristic pattern of facial anomalies, growth retardation, and central nervous system dysfunction.[1] An extensive body of literature has documented significant cognitive, behavioral, and emotional difficulties among children with FAS,[2–5] as well as among children who have been prenatally exposed to alcohol, but do not meet the full criteria for FAS.[6–9] This latter group of individuals may be diagnosed with partial FAS, alcohol-related neurodevelopmental disorder (ARND), or alcohol-related birth defects (ARBD) and, together with those diagnosed as having FAS, are increasingly being referred to under the larger rubric of fetal alcohol spectrum disorders (FASDs).[10]

Despite the abundance of findings that prenatal alcohol consumption is associated with increased negative consequences for growth and development,[3] as well as campaigns to increase public awareness regarding the risks of prenatal alcohol use, research indicates a substantial increase in alcohol consumption among pregnant women.[11] Recent estimates suggest that approximately 1% of children born in the United States meet criteria for FASDs,[12] highlighting FASDs as a significant public health concern and important area of empirical inquiry.[13]

A considerable body of research attests to the adverse effects of prenatal alcohol exposure for children's development. Numerous studies have shown individuals with FASDs to experience a broad range of cognitive and academic problems[14] and impairments in executive[6,15] and adaptive[14,16,17] functioning. Researchers also have found higher rates of externalizing[18–20] and internalizing[7,8,21,22] behavior problems in children with prenatal alcohol exposure. In light of the myriad of impairments exhibited by children with FASDs, it is not surprising that investigators have suggested that such children are more challenging to parents and thus can create significant stress in the family.[20,23]

Previous research suggests that parents of children with behavioral or emotional difficulties often experience increased levels of stress associated with childrearing.[24–28] There is also a mounting body of research documenting higher levels of stress among parents of children with developmental problems than parents with typically developing children.[29,30] These higher levels of stress do not appear to be transient perturbations in parental well-being, but rather are fairly chronic and may even increase over time.[29,31]

Although findings of increased stress among parents of children with behavioral or developmental problems are fairly well established, there nonetheless appears to be considerable variability among such parents in their experience of stress.[32] Some studies suggest that parenting stress may vary as a function of the child's diagnosis or

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disability.[33,34] However, such differences may have less to do with the child's type or level of disability and more to do with associated impairments in functioning. A recent study found that parents of developmentally delayed preschoolers reported higher levels of stress than parents of children without developmental delays, but this difference was attributable to the child's behavioral problems rather than to the extent of their cognitive delay.[29]

Other research has examined the role of family factors that might contribute to parenting stress, including family structure and socioeconomic factors. Some studies have found higher levels of stress among single parents of children with disabilities than among married or partnered parents.[35] Higher levels of stress have also been documented in adoptive parents when compared to biological parents,[36] although increased stress among adoptive parents may be at least partly related to the child's behavior problems.[37,38] Research also suggests that economic difficulties are predictive of parental stress,[39] and such stress may have even more of an impact in families with children with behavioral or developmental problems.[40,41]

The wealth of studies documenting increased stress among parents of children with behavioral and/or developmental problems suggests that parents of children with FASDs are likely to be vulnerable to experiencing higher than normal levels of stress. However, there has been limited examination of stress among parents of these children. One previous study[20] demonstrated that biological mothers of children with moderate or heavy prenatal alcohol exposure reported higher levels of parenting stress than mothers of children with no or light prenatal exposure. Moreover, higher levels of maternal stress were predicted by higher levels of child externalizing behavior and fewer family resources. Although such findings suggest that parents of children with prenatal alcohol exposure are at increased risk of experiencing high levels of stress, they also raise important issues for further study, including whether similar associations might be documented in parents of children who actually meet criteria for FAS or another related condition and whether other child and family factors might also contribute to parenting stress in this population.

Thus, one major focus of the current study was an exploration of child characteristics and family factors that might be associated with stress among parents of children with FASDs. Regarding child characteristics, we considered the contributions of cognitive, executive, adaptive, and behavioral functioning, given that children with prenatal alcohol exposure have been found to exhibit impairments in all of these domains. We also explored whether parents of children who met criteria for a diagnosis of FAS would report different levels of stress than parents whose children did not meet the full criteria for FAS, but instead met criteria for a related condition, specifically Partial FAS or ARND. We also considered what family factors might contribute to increased stress in parents of children with FASDs. Previous research suggests that single parents would report higher levels of stress than parents who were married or living with a partner, perhaps because single parents would be less likely to have someone else with whom to share the responsibility of caring for their child. Custodial arrangements may also contribute to parenting stress. Although previous research indicates that adoptive parents often report higher levels of parenting stress than biological parents, it seemed possible that the biological parents (especially mothers) in our sample might report higher levels of stress, either if they felt responsible for their child's difficulties or because their previous use of alcohol was indicative of some underlying vulnerability to stress. Thus, we examined whether the custodial status of the parents (biological versus adoptive/foster) played a role in predicting parenting stress. The adequacy of family resources was also considered as a possible predictor of parenting stress.

Finally, we examined whether parenting stress was related to teacher reports of the child's characteristics. Previous research has not always found a link between parent stress and child behavior problems when such problems are rated by teachers,[42] raising the question of whether parents who are highly stressed may be especially inclined to perceive their child more negatively. Thus, we investigated the associations between parenting stress and children's executive, academic, adaptive, and behavioral functioning, as reported by teachers.

METHODS

Participants

The sample consisted of 100 children (51% male) with prenatal alcohol exposure and their parents. Children had a mean age of 8.59 years (SD = 1.56; range, 6.0–11.58). The ethnic composition of the sample was 54% non-Hispanic white, 17% African American, 17% Hispanic, 2% Asian, and 10% other or mixed ethnicity. Twenty-three percent of the children lived with one or both biological parents, with the remaining 77% living with adoptive or foster parents. The majority of this latter group were children living with adoptive parents (71%), with a small minority living with foster parents (6%). Moreover, all the participants who were in foster care were in the process of being adopted by their foster parents. For children who were adopted or in foster care, the mean number of placements was 2.75 (SD = 1.84; range, 1–7). Mean education level for the child's primary caregiver was 16.28 years (SD = 0.26; range, 10–20). The majority (62%) of primary caregivers were married or living with a partner, with the remainder being single, separated, divorced, or widowed.

Procedure

All study procedures were approved by the Institutional Review Boards for the University of California, Los Angeles and the Centers for Prevention and Disease Control, and a Certificate of Confidentiality was obtained from the National Institute of Alcohol Abuse and Alcoholism. Children and their parents were recruited as part of a larger study on a social skills intervention for children with prenatal alcohol exposure. Children were recruited through a large medical center on the west coast of the United States, community mental health clinics, private practitioners, local

schools, flyers posted in the community, and a website affiliated with the medical center. All children were required to have documented prenatal alcohol exposure. Both the children and the parents needed to be fluent in English. Additionally, parents were excluded if they were currently abusing alcohol as measured by the Alcohol Use Disorders Identification Test.[43]

Once interested participants contacted the project, they were screened over the telephone to determine their initial eligibility for the larger study. If the child and parent(s) were initially eligible, they were then scheduled for an in-person assessment to determine their final eligibility for the larger study. Informed consent and assent forms were reviewed and completed with the parents and with children 7 years and older, respectively. The parents and children then participated in testing which involved obtaining demographic information, child I.Q. screening, a physical examination to assess the child for dysmorphology associated with prenatal alcohol exposure, and parent report of the child's executive, adaptive, and behavioral functioning, and their own parenting stress and adequacy of resources. For all parent report measures, we requested the primary caregiver complete the questionnaires. With parent consent, teachers completed measures of the child's executive, academic, adaptive, and behavioral functioning.

Measures

Demographic Questionnaire. Demographic variables included child gender, age, ethnicity, custodial status (biological versus adoptive/foster), number of placements (for adoptive/foster children), and parent education.

Health Interview for Women. To obtain information on children's prenatal alcohol exposure, all biological mothers in the study were interviewed using the Health Interview for Women.[44] The interview yields standard alcohol measures of average and maximum number of drinks per drinking occasion, and the frequency of both. One drink was considered to be .60 ounces of absolute alcohol. All alcohol levels obtained were considered estimates of actual exposure because they were based on maternal self-report. Criteria for alcohol exposure was that the mother drank seven or more drinks per week or three or more drinks per drinking occasion during pregnancy. In a recent study,[45] a cut point of seven or more drinks per week had 100% sensitivity and 83% specificity for diagnosis of FASDs. In other studies, a cut point of three or more drinks per drinking occasion has been a statistically significant predictor of behavioral teratogenesis associated with prenatal alcohol exposure.[21,46]

Review of Medical Records. For adoptive/foster children, medical, adoption, or legal records were obtained documenting known exposure. Examples of such documentation included medical records that indicated the biological mother was intoxicated at delivery, or adoption records indicating that the mother was observed to drink heavily during pregnancy by a reliable collateral source. Because many children with prenatal alcohol exposure are either adopted or in foster care, it is often necessary to rely on such records to assess the child's history of exposure and is accepted practice in the scientific community when making a diagnosis of fetal alcohol syndrome (FAS) or a related condition.[47]

Fetal Alcohol Spectrum Disorders Diagnosis. All children received a physical examination to evaluate the presence of the diagnostic features of fetal alcohol spectrum disorders (FASDs) using guides by Astley and Clarren.[48,49] This system uses a 4-digit diagnostic code reflecting the magnitude of expression of each of the four key diagnostic features of FAS: (1) growth deficiency, (2) the FAS facial phenotype, (3) central nervous system dysfunction, and (4) gestational alcohol exposure. Using the four-digit diagnostic code, the magnitude of expression of each feature was ranked independently on a 4-point Likert scale with 1 reflecting complete absence of the FAS feature and 4 reflecting the full manifestation of the feature. The study physician administered this examination after achieving reliability with the lead investigator, who was trained in the method by Drs. Astley and Clarren. The examining physician, a board certified child psychiatrist, had extensive expertise and experience in diagnosing and treating children and adolescents with a wide variety of psychiatric diagnoses, developmental disabilities, and/or genetic disorders. In conducting the physical examinations to assess the children for features of FASDs, the physician routinely considered any possible genetic causes that might underlie their presentation. None of the study children exhibited features consistent with a genetic syndrome that might better account for their presentation. On the basis of the four-digit code diagnostic system, 11% of the children were diagnosed as having FAS, 43% of the children were diagnosed with partial FAS, and 46% were diagnosed with static encephalopathy. This latter group of subjects would be classified as having alcohol-related neurodevelopmental disorder (ARND), according to guidelines developed by Dr. Astley (written communication, July 2005) for converting the four-digit code to the diagnostic categories proposed by the Institute of Medicine (IOM)[50] and also consistent with the guidelines proposed by Chudley and colleagues[51] for reconciling the IOM nomenclature and the four-digit code.

Alcohol Use Disorders Identification Test. Parents were administered the Alcohol Use Disorders Identification Test (AUDIT), a measure developed by the World Health Organization[43] to assess any current high-risk drinking. The AUDIT contains 10 items and has been shown to have high sensitivity and specificity (with a cut point of ≥ 8) in a six-nation validation trial using heavy drinking as the criterion.[52] The mean AUDIT score for the sample was 2.04 (SD = 2.03).

Kaufman Brief Intelligence Test. The child was administered the Kaufman Brief Intelligence Test (K-BIT),[53] a brief, individually administered, psychometrically sound measure of verbal and nonverbal intelligence for individuals aged 4 to 90 years. I.Q. scores are based on standard scores, with a mean = 100 and SD = 15. The child's Composite I.Q. was used as an index of their general cognitive functioning. For the current sample, the mean Composite I.Q. was 97.24 (SD = 14.83).

The Behavior Rating Inventory of Executive Functioning. The child's executive functioning was assessed with

the Behavior Rating Inventory of Executive Functioning (BRIEF), parent and teacher forms,[54,55] a measure standardized for children ages 5–18. The BRIEF yields a Global Executive Composite score, an overall measure of the child's executive functioning, with *T* scores of ≥65 (1.5 SD above the mean) considered to be clinically significant (higher scores indicate poorer executive functioning). The BRIEF Global Executive Composite demonstrates high internal consistency (Cronbach's alpha = .97–.98) and test-retest reliability (*r* = .81–.91) for normative and clinical samples.[54,55] Convergent validity has been established with other measures of inattention, impulsivity, and learning skills and divergent validity demonstrated against measures of emotional and behavioral functioning. Due to a procedural oversight, the teacher version of the BRIEF was not obtained for subjects in the early stages of the study, resulting in the BRIEF-Teacher Form (BRIEF-T) being obtained for a subsample of 58 study children. However, a comparison of children for whom the BRIEF-T was obtained and those children for whom the BRIEF-T was not obtained revealed no significant differences in either child-related or parent-related stress. For the study sample, the mean *T* scores on the Global Executive Composite were 71.54 (SD = 10.90) for the parent form and 67.60 (SD = 17.62) for the teacher form.

Vineland Adaptive Behavior Scales, Interview Edition, Survey Form. The Vineland Adaptive Behavior Scales, Interview Edition, Survey Form (VABS) is an interview designed to elicit a parent's assessment of their child's adaptive functioning in four domains: communication, daily living (self-help), social, and motor skills.[56] Standard scores are derived for each of these domains, as well as for an Adaptive Behavior Composite, which reflects functioning across all domains. For the present study, the child's Adaptive Behavior Composite was used as an index of their general level of adaptive functioning. The Adaptive Behavior Composite demonstrates good test-retest reliability (.88), and interrater reliability (.74).[56] Higher scores on the Adaptive Behavior Composite indicate better adaptive functioning. For the study sample, the mean Adaptive Behavior Composite was 61.56 (SD = 10.80).

Child Behavior Checklist. The Child Behavior Checklist (CBCL)[57] is a parent-report rating scale that assesses children's behavior problems and is standardized for children ages 6–18 years. The Externalizing and Internalizing Behavior Scales were used in this study as an index of the child's behavior problems. These scales demonstrate good internal consistency (Cronbach's alpha = .94–.97) and test-retest reliability (*r* = .91–.92). Validity studies have demonstrated the CBCL's utility in differentiating clinical from nonclinical populations.[57] *T* scores (mean = 50; SD = 10) >63 on the Externalizing and Internalizing scales are considered to be in the clinical range (higher scores indicate more problematic behavior). For the study sample, the mean *T* scores were 68.04 (SD = 9.65) for the Externalizing Scale and 63.47 (SD = 10.29) for the Internalizing Scale.

Teacher Report Form. The Teacher Report Form (TRF), standardized for children 6–18 years old, is a rating scale completed by teachers that assesses children's behavior problems in the school setting.[58] The TRF yields the same broad band scales (Externalizing and Internalizing) as the CBCL, as well as an Academic Performance scale and an Adaptive Functioning summary score. For the Externalizing and Internalizing scales, a *T* score >63 is considered to be in the clinical range, whereas for the Academic Performance scale and the Adaptive Functioning summary score, a *T* score <37 is considered to be in the clinical range. These scales demonstrate high internal consistency (Cronbach's alpha = .90–.95) and test-retest reliability (*r* = .86–.93).[58] For the study sample, the mean Externalizing *T* score was 61.25 (SD = 10.43), the mean Internalizing *T* score was 56.68 (SD = 10.07), the mean Academic Performance *T* score was 43.82 (SD = 8.49), and the mean Adaptive Functioning *T* score was 41.16 (SD = 6.42).

Family Resources Scales. Parents completed this 30-item questionnaire to assess the adequacy of resources in their household.[59] The items are arranged according to a hierarchy, ranging from very basic needs (e.g., food, clothing), social needs (e.g., time with family), adequate transportation, medical and dental care, and finally resources for less critical needs such as entertainment and toys. This measure has good internal consistency (.92) and test-retest reliability (.70) and has been found to predict distress in parents of children with developmental disabilities.[60] Scores can range from 30 to 150, with lower scores indicating fewer resources. The average Family Resources Scale score for study families was 124.50 (SD = 16.15), suggesting adequate resources for the sample as a whole.

Parenting Stress Index. The Parenting Stress Index (PSI)[61] assesses the level of stress in the parent's life that is related to parental characteristics (Parent Domain score) and child characteristics (Child Domain score). The Child Domain score is composed of six subscales, including Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability. Elevated scores in this domain may reflect child characteristics ''that make it difficult for parents to fulfill their parenting roles''.[61] The Parent Domain is composed of six subscales, including Competence, Isolation, Health, Role Restriction, Depression, and Spouse. Higher scores in this domain may reflect parenting stress that is associated with aspects of the parent's functioning (e.g., depressed mood) or their social network (e.g., an unsupportive spouse). The PSI Child and Parent Domains demonstrate adequate internal consistency (Cronbach's alpha = .90–.93) and test-retest reliability (*r* = .55–.91) and have been well validated in cross-cultural studies and studies of mothers who used drugs during pregnancy.[62,63] Both the Child and Parent Domain raw scores were used for analysis. Although the Parent Domain and Child Domain scores can be summed to yield a Total Stress score, we opted to examine the Child and Parent Domains separately, as previous studies suggest that stress in each of these two domains may be predicted by different factors.[40,64] The means for the normative sample[61] were 99.7 (SD = 18.8) for the Child Domain and 123.1 (SD = 24.4) for the Parent Domain score.

Data Analysis Plan

Data were first analyzed to assess for any demographic variables that might serve as covariates in the prediction of

Table 1. Correlations of Child Characteristics and Family Factors with Parent and Child Domains of the Parenting Stress Index

	Parenting Stress Index	
Predictor Variables	Child Domain	Parent Domain
Composite I.Q.	.05	.09
Executive functioning	.70**	.20*
Adaptive functioning	−.26**	−.18
Externalizing behavior	.62**	.24*
Internalizing behavior	.41**	.21*
FAS diagnosis	.15	.09
Custodial status	.35**	−.24*
Marital status	.01	−.21*
Family resources	−.19	−.47**

*$p < .05$; **$p < .01$.
FAS, fetal alcohol syndrome.

child domain or parent domain stress. Correlational analyses were then conducted to examine the associations of child and parent domain stress with child and family variables (Table 1). Variables that were significantly associated with child or parent domain stress were entered into regression equations in order to examine which variables made a unique contribution to the prediction of child or parent domain stress, respectively (Table 2). Finally, correlational analyses were conducted to examine the associations of child and parent stress with teacher ratings of child behavioral, academic, and adaptive functioning (Table 3).

Table 2. Prediction of Child-Related and Parent-Related Stress

	F	β	B (SE)	R^2 (Adjusted R^2)
Child-related stress	27.03**			.59 (.57)
Executive functioning		.40**	.92 (.22)	
Adaptive functioning		−.18*	−.41 (.16)	
Externalizing problems		.23*	.60 (.25)	
Internalizing problems		.15*	.37 (.18)	
Custodial status		.15*	8.62 (4.18)	
Parent-related stress	6.04**			.28 (.23)
Executive functioning		.09	.20 (.29)	
Externalizing problems		.18	.46 (.33)	
Internalizing problems		−.02	−.05 (.25)	
Custodial status		−.21*	−12.33 (6.00)	
Marital status		−.06	−2.80 (4.84)	
Family resources		−.35**	−.53 (.16)	

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

Table 3. Correlations of Teacher-Reported Child Characteristics with Child-Related and Parent-Related Stress

	Parenting Stress Index	
	Child Domain	Parent Domain
Child characteristics		
Academic performance	−.10	.07
Executive functioning[a]	.34**	.17
Adaptive functioning	−.15	−.10
Externalizing behavior	.31**	.12
Internalizing behavior	.29*	.11

[a]For the teacher's measure of executive functioning (Behavior Rating Inventory of Executive Functioning-Teacher Form [BRIEF-T]), data were not available for 42 of the children due to a procedural error. Analyses were conducted to impute the BRIEF-T data for those participants with missing data. With data imputation, similar results were obtained when examining the association of teacher-reported executive functioning with parenting stress (BRIEF-T and Child Domain of the Parenting Stress Index (PSI): $r = .30$, $p < .01$; BRIEF-T and Parent Domain of the PSI: $r = .12$, not significant).
*$p < .05$; **$p < .01$.

RESULTS

Demographic Variables

In examining the role of various child characteristics and family factors in predicting stress among parents of children with fetal alcohol spectrum disorders (FASDs), it was important to first consider a number of demographic variables that might relate to parental stress. These possible covariates included the child's age, gender, ethnicity, number of placements (for adopted/foster children), and parent education. Analyses revealed that none of these variables was significantly associated with parental stress in the study sample.

Predictors of Child Domain Stress

The associations of child domain stress with child characteristics and family factors are presented in Table 1. Correlational analyses revealed that child domain stress was not associated with child I.Q., a diagnosis of fetal alcohol syndrome (FAS), parents' marital status, or adequacy of family resources. However, child domain stress was associated with poorer executive and adaptive functioning and higher levels of externalizing and internalizing behavior in the child. There was also a significant association between child domain stress and custodial status due to higher levels of child-related stress among adoptive/foster parents than biological parents.

We next conducted a regression analysis to examine the relative contributions of child characteristics and family factors in predicting child-related stress. Only those variables that were significantly associated with child-related stress were entered simultaneously in the regression equation. This method allows for examination of the association of each predictor to the outcome variable after controlling for all other variables. As seen in Table 2, the overall model predicting child-related stress was significant, $F_{5,94} = 27.03$, $p < .01$ (adjusted $R^2 = .57$). Impaired child executive functioning, poorer adaptive functioning, and higher levels of externalizing and internalizing

behavior all made independent and significant contributions to the prediction of child-related stress in parents of children with FASDs. In addition, adoptive/foster parent status made a significant and independent contribution to the prediction of child domain stress.

Predictors of Parent-Domain Stress

Correlational analyses (Table 1) revealed that higher levels of parent domain stress were significantly related to impaired child executive functioning and higher levels of externalizing and internalizing behavior. Additionally, custodial status, parents' marital status, and level of family resources were all associated with parent domain stress. Specifically, biological parents, single parents, and parents with fewer resources all reported higher levels of parent-related stress. Parent domain stress was not related to the child's I.Q., adaptive functioning, or having a diagnosis of FAS.

A regression analysis to examine the relative contributions of child characteristics and family factors in predicting parent-related stress yielded a significant overall model (Table 2), $F_{6,93} = 6.04$, $p < .01$ (adjusted $R^2 = .23$). However, only custodial status and family resources were significant independent predictors of parent domain stress, with biological parent status and fewer family resources predicting higher levels of parent-related stress. Child variables no longer made statistically significant contributions to the prediction of parent domain stress after accounting for custodial status and family resources.

Association of Child Domain and Parent Domain Stress with Teacher Ratings

We also examined the associations of child-related and parent-related stress with teacher reports of the child's functioning (Table 3). Although child-related stress was not associated with the teacher's report of the child's academic performance or adaptive functioning, it was significantly related to the teacher's report of impairments in the child's executive functioning, as well as externalizing and internalizing behavior problems. In contrast, parent-related stress was not associated with any of the teacher ratings of the child's functioning.

DISCUSSION

Findings from the current study help elucidate different patterns of predictors of stress in parents of children with fetal alcohol spectrum disorders (FASDs). Consistent with previous studies,[28,65] associations were documented between child behavior problems and parent reports of higher levels of child-related stress, that is, stress associated with the parent experiencing the child as demanding or finding it particularly challenging to care for the child. Furthermore, regression analyses revealed that both externalizing and internalizing behaviors were independent and significant predictors of child domain stress. Although it is not surprising that it would be stressful to care for a child with high levels of overactive and/or disruptive behavior, it is important to note that the parents in our sample also experienced higher levels of stress when their children were viewed as withdrawn, anxious, and/or depressed. Although such children may not be as behaviorally problematic, parents may still worry about the well-being of these children and perhaps face other challenges, such as concerns about their children's potential for developing more severe internalizing problems, such as mood or anxiety disorders. As internalizing problems are not uncommon in children with prenatal alcohol exposure,[7,8,22,44] it is important not to overlook the need for support among parents who are caring for children whose behavior may not be overtly difficult to manage, but may nonetheless be quite worrisome.

Both executive and adaptive functioning were also independent and significant predictors of parents' reports of child-related stress in this sample. To date, we know of no previous investigations of the association between parenting stress and children's executive functioning. However, it seems reasonable that parents of children who exhibit deficits in ''cognitive skills that are responsible for the planning, initiation, sequencing, and monitoring of complex goal-directed behavior''[66] would report higher levels of child-related stress. Executive functioning deficits are well documented in children with FASDs, and, interestingly, impairment in this domain was the strongest predictor of parent report of child-related stress in this sample. It is notable that executive and adaptive functioning were predictive of child-related stress, whereas I.Q. was not. These findings suggest that it was not general cognitive impairment, but rather specifically the child's cognitive limitations in planning and organizing their behavior in order to engage in effective problem solving and their ability to perform developmentally appropriate tasks in everyday life that were especially taxing to parents.

The custodial status of parents was also a significant predictor of child-related parenting stress, that is, adoptive and foster parents reported higher levels of child-related stress than did biological parents. Notably, adoptive/foster parent status was predictive of child-related stress, even after accounting for the contributions of the child's characteristics. One possible explanation for these findings is that adoptive/foster parents may not have been adequately prepared for the severity of their child's difficulties, particularly as some were initially unaware of their child's prenatal exposure to alcohol, whereas others may not have been fully cognizant of the potential risks of prenatal exposure to alcohol before bringing the child into their family.

A different pattern of findings for predictors of parent-related stress was obtained in the present study. Although simple correlations indicated there were associations between parent-related stress and child characteristics, none of these characteristics were significant predictors of parent-related stress after accounting for the contribution of family factors. The fact that child characteristics were associated most specifically with the child domain of the Parenting Stress Index (PSI) and less with stress associated with feeling inadequate in the task of parenting, as indexed by the parent domain of the PSI, suggests that these parents were not just inclined to rate all aspects of

their parenting experiences more negatively and that their observations concerning the problematic behaviors of their alcohol-exposed children may have been reasonably valid. The only significant predictors of parent domain stress were custodial status and level of family resources, with biological parent status and fewer family resources predicting higher levels of parent-related stress.

Notably, there was no association between the severity of the child's FASD diagnosis and either child domain or parent domain stress. Parents of children who met full criteria for a diagnosis of fetal alcohol syndrome (FAS) did not report higher levels of parenting stress than parents of children who did not meet the full criteria, but instead were diagnosed with either partial FAS or alcohol-related neurodevelopmental disorder (ARND). Consistent with previous research, parenting stress, particularly child domain stress, appeared to be more strongly related to the child's functional impairments rather than to their particular diagnosis. This finding has important clinical implications in that it highlights the need for support for parents of children across the entire spectrum of disorders associated with prenatal alcohol exposure, and not just those caring for children with FAS.

Analyses also revealed that teacher reports of impairments in the child's executive functioning and higher levels of externalizing and internalizing behavior were associated with child domain, but not parent domain, stress. Furthermore, teacher ratings of the children's academic performance and adaptive functioning in the school setting were not associated with either child domain or parent domain stress. The fact that relatively similar patterns of results were obtained whether parents or teachers were rating the child's characteristics suggests that associations between child-related parenting stress and parent ratings of the child's functioning may not simply be attributable to highly stressed parents viewing their children more negatively. The results from both parent and teacher data suggest that it is not children's general cognitive delays or poor academic performance, but rather their behavioral problems and poor planning and organizational skills that are especially stressful for the adults who are caring for them.

A number of issues merit discussion in terms of limitations of this study and directions for future research. First, the present study was aimed at examining potential predictors of stress among parents of children with FASDs; however, the correlational nature of the data precludes drawing any definitive conclusions regarding the direction of linkage among these variables. It is equally plausible that highly stressed parents may behave in ways that contribute to their child's difficulties. The relationship between child functioning and parenting stress is likely a reciprocal one. Previous research suggests that parenting stress can lead to later child behavior problems after accounting for initial behavior problems,[29] but also that challenging child behavior can lead to significant increases in parenting stress over time.[67] Such a process highlights the importance of providing support and intervention not only to children with FASDs, but to their parents and caregivers as well in order to interrupt what is likely to be a self-perpetuating cycle.

The finding that adoptive/foster parent status was predictive of higher levels of child-related stress underscores the importance of not only providing greater support to these caregivers, but also providing them with better education and training regarding the difficulties faced by children with FASDs. In a recent study,[68] when queried about what they would require in order to provide a successful foster placement for a child with FASD, among the primary needs foster parents highlighted were social, instrumental, and professional support and services, and an understanding of FASDs, including knowledge and skills related to behavioral management and parenting children with disabilities, and knowing ''what you are getting into''. Children in foster care are at increased risk of FASDs,[69] and it has been estimated that approximately two thirds of children with FASDs are likely to be raised outside their biological homes.[70] Providing adoptive and foster parents with adequate resources and training in caring for children with FASDs would likely help ameliorate their own stress and enhance their ability to facilitate the development of these at-risk children.

It should not be overlooked that biological parent status was associated with higher levels of parent domain stress. Although none of the biological mothers in this sample currently met criteria for high-risk drinking, and in fact the majority were no longer drinking any alcohol, it is possible that higher levels of parent-related stress may have reflected unresolved feelings about having consumed alcohol during pregnancy. Biological parents of children with FASDs may also feel stigmatized, particularly if others are aware of the child's disability. Thus, it is imperative that support and resources also be provided for biological parents who are caring for a child with FASD in order to enhance their sense of efficacy as parents and their ability to promote their children's adjustment and well-being.

Findings from the present study suggest the importance of early intervention not only with children affected by FASDs, but with their families as well. Early identification and intervention appear to play a crucial role in the prevention of secondary disabilities in children with FASDs.[23] As these children likely require considerable support from their parents in learning to better organize, plan, and regulate their own behavior, it is essential that parents be provided with the necessary skills and knowledge to facilitate their children's development in these areas. Indeed, the most effective interventions may be those that not only aim to ameliorate the myriad of cognitive, social, and behavioral difficulties often exhibited by this population of children, but also focus on providing support, education, and training to maximize the well-being and efficacy of their parents and caregivers.

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