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| Abstract: | Children with developmental delays (DD) are at heightened risk for developing behavior problems, which contributes to parenting stress and caregiving burden. There is an established relation between parenting behaviors and child developmental outcomes with less known about parent-child interactions in young children with DD. The present study examined the associations between parenting behaviors and child behavior in a sample of 180 families with preschool-aged children with DD. Results indicated that caregivers' harsh and coercive behaviors were associated with observed challenging behavior in children. Child age, as well as the number of commands issued by caregivers were associated with noncompliance in children. The significance and limitations of these findings are discussed, as well as recommendations for interventions and future research. |

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Abstract

Children with developmental delays (DD) are at heightened risk for developing behavior problems, which contribute to parenting stress and caregiving burden. There is an established relation between parenting behaviors and child developmental outcomes with less known about parent–child interactions in young children with DD. The present study examined the associations between parenting behaviors and child behavior in a sample of 180 families with preschool-aged children with DD. Results indicated that caregivers' harsh and coercive behaviors were associated with observed challenging behavior in children. Child age, as well as the number of commands issued by caregivers were associated with noncompliance in children. The significance and limitations of these findings are discussed, as well as recommendations for interventions and future research.

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Associations Between Parenting Behaviors and Behavioral Problems in Young
Children with Developmental Delays

Children with developmental delay (DD) are three to four times more likely to display challenging behaviors than children without DD (Baker et al., 2003). These behavioral problems can include aggression, non-compliance, destruction, overactivity, and self-injury (Emerson, 2001) and place children with DD at heightened risk for the development of comorbid psychopathology. Baker et al. (2010) conducted a longitudinal study of 236 children (95 of which had DD) and found that over 50% of the children with DD met criteria for at least one psychiatric disorder at the age of five, with attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) being the most common. The presence of a developmental delay may indeed be a risk factor for the development of behavioral problems, yet developmental delays are heterogeneous and often represent a range of functioning. The pathways to various developmental outcomes are complex and influenced by myriad child, family, and contextual risk factors. Factors related to the development of behavioral problems in children with DD include poorer self-regulation skills, adaptive, and language skills (Chow & Wehby, 2018; McIntyre et al., 2006). Some of the risk factors for the development of behavior problems in children with DD represent not easily malleable factors. For example, contextual risk (e.g., poverty, education, income, etc.), has been found to be associated with increased behavior problems in children (Mazza et al., 2016).

The presence of significant behavioral challenges in individuals with DD can present families, social services, and schools with unique challenges. For example, Bruininks and colleagues (1988) determined that throughout the lifespan, significant behavioral problems in individuals with dual diagnoses restricted their ability to fully integrate into educational,

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residential, and employment settings. The presence of challenging behavior in individuals with DD have been found to be associated with an increased risk of out of home placements, as well as more restrictive placements (McIntyre et al., 2002).

Parenting Behavior and Associated Behavior Problems in Children

Parent–child interactions are an integral part of children’s development. The onset and escalation of some problem behaviors may be influenced by coercive, dyadic exchanges between caregivers and their children (Patterson, 1982). Lindahl (1998) described coercive parenting as an “attempt [for parents] to influence the child through the use of force, physical manipulation, or harsh, repetitive commands” (p. 421). Caregivers who have children with behavior problems are more likely to engage in coercive, harsh, and controlling behaviors (Scaramella & Leve, 2004), creating a vicious coercive cycle. Day and colleagues (2021) conducted a cross-sectional study of 1,392 children aged 2–12 with disabilities and found that the use of coercive parenting behaviors increased with escalations in child behavior problems. Additional child factors may increase the likelihood of coercive parenting behaviors. Carson et al. (2007) examined self-reported parenting behaviors in young children with and without language delays and found that parents of children with language delays reported themselves as using higher rates of punitive discipline factors, suggesting differences in parenting behaviors by child developmental status.

Additionally, harsh and/or punitive parenting strategies (Scaramella & Leve, 2004; Zubizarreta et al., 2019) and inconsistent discipline (Shaw et al., 2003) have also been associated with increased internalizing and externalizing behaviors in typically developing children. Zubizarreta et al. (2019) completed a longitudinal study with 572 children and their caregivers and found that harsh punishment practices by caregivers increased both internalizing and externalizing problems in children. Adolescents with intellectual disability were found to have

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higher rates of behavior problems when their parents endorsed more frequent use of criticism, low parental warmth and harsh, punitive discipline practices (Chadwick et al., 2008). Parental consistency (e.g., following through with commands, consistent praise) and consistent discipline have also been focal points of research in predicting problem behavior in children, such that consistent discipline strategies have been found to positively correlate with compliance (Gardner, 1989; Lytton, 1977). Together, these studies highlight the importance of consistent, clear parenting practices for children with or at-risk for challenging behavior, such as those with DD.

Current Study

Research has demonstrated clear associations between parenting and the development of problem behavior in typically developing children, although fewer studies have focused on these associations with young children with DD. Children with DD represent a particularly vulnerable population, given their heightened risk for developing mental health and/or challenging behavior (Emerson, 2003). Consequently, caregivers of children with DD and problem behavior are prone to higher levels of stress, which may impact their parenting abilities to appropriately address behavior problems in their children (McIntyre & Kunze, 2021). Most studies that include parenting and child challenging behavior have relied on self-report, with fewer studies relying on direct observations (McIntyre, 2013; McIntyre & Kunze, 2021).

Research questions. The present study extended previous research on parent–child interactions by exploring the relations between parenting behaviors and child problem behaviors in a large sample of preschool-aged children with DD. We asked four research questions: (1) How often do caregivers of children with DD use undesired parenting practices? (2) Are caregivers’ undesired command behaviors (e.g., number of commands and inappropriate commands and/or lack of follow through) associated with noncompliance in children with DD?)

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(3) Are caregivers' use of harsh parenting behaviors (e.g., positive consequences for inappropriate behavior, criticism, and/or physical aggression) associated with observed problem behavior in children with DD? (4) Are caregivers' use of harsh parenting behaviors (e.g., positive attention for inappropriate behavior, criticism, and/or physical aggression) associated with parent-reported problem behavior in children with DD? We investigated the contributions of parent education, income, child age, and child diagnosis in all models.

Hypotheses. It was hypothesized that higher use of caregivers' commands and inappropriate commands and/or lack of follow through would be associated with higher rates of noncompliance in children with DD. It was hypothesized that higher use of caregiver's undesired/inappropriate parenting behavior would be associated with both observed child problem behavior and parent-reported problem behavior.

Method

Participants

Participants were 180 preschool-aged children with DD and their primary caregivers participating in a larger randomized controlled trial investigating a parenting intervention on child and family functioning (GRANT # PI Blinded for Peer Review). Data for the current study were from baseline assessments conducted prior to intervention. Inclusionary criteria for the larger RCT included: 1) child age between 2–5 years, 2) child presence of a developmental delay; 3) and child in custodial care of parent or guardian for 1+ years. Children were excluded if they were non-ambulatory, deaf, or blind. No criteria were required for the presence of behavioral problems. Children were recruited from local agencies that provided early intervention services and were required to have either an individualized education program or an

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individualized family service plan that documented a DD or disability. Caregivers reported on the presence of DD and services received. Table 1 details child and parent demographics.

Measures

Demographic survey. Parents provided demographic information via an in-person interview with research assistants. Variables of interest included: child age, child race/ethnicity, child sex, parent age, parent sex, parent race/ethnicity, annual household income, parent education level, and number of individuals living in home.

Parent-reported child behavior problems. The *Child Behavior Checklist for Ages 1 ½ - 5* (CBCL; Achenbach & Rescorla, 2000) is a 99-item, norm-referenced checklist that examines a variety of social and behavioral problems in young children and was completed by primary caregivers. Scores on the CBCL are reported as *T*-scores ($M = 50$; $SD = 10$), with higher scores indicating more significant behavioral problems. The Total Problems score includes all items and is comprised of scores from both the Internalizing Problems and Externalizing Problems. Scores on the Externalizing Problems scale were used in the present study. The internal consistency reliability for the CBCL Externalizing Problems scale in the present sample was high ($\alpha = .93$).

Observed caregiver behaviors and child behavior problems. A 15-minute parent–child interaction task was coded to extract parent and child behaviors. The observation was conducted in the family home and video-recorded for later coding. Trained coders analyzed video recordings using paper and pencil, which was later transferred, and data were extracted and analyzed. The *Parent Child Behavior Observation System* (PCBOS; Phaneuf & McIntyre, 2007) was used to code observed parent and child behaviors across three tasks during the 15-minute observation. The proportion of 30-second intervals that included the specific caregiver and child target behaviors was calculated using a partial interval recording method, which documents the

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presence of absence of the target of behavior during each interval. Data were collected using the PCBOS across each of the three tasks (10 min free play, 2 min clean-up, 3 min structured activity) separately to examine differences in parenting behaviors.

Child target behaviors included negative verbalizations and noncompliance. Negative verbalizations were defined as any instance of negative vocalizations, such as whining, screaming, swearing, threats, yelling, or growling. Noncompliance was defined as failure to follow or attempt to follow a caregiver-delivered command within five seconds. Compliance was calculated based on the number of times a child complied divided by the total number of commands delivered by the caregiver and then multiplied by 100. Compliance/noncompliance data were only collected during the clean-up task, given that the free play and structured activity tasks did not have clear expectations for the child to comply.

Parent target behaviors included number of commands, inappropriate commands, lack of follow through, positive consequences for child inappropriate behavior, aggression, or criticism. A command was defined as clear and firm directives for behavior change in the immediate future. Commands were only calculated during the two-minute clean up task. Inappropriate commands were defined as commands that were ambiguous, phrased as a question, or repeated more than twice. Lack of follow through included providing escape following the delivery of a demand or failing to provide praise following child compliance. Positive consequences for inappropriate behavior included delivery of either vocal attention, physical attention, or a tangible object following inappropriate child behavior. Aggression included yelling, irate tone of voice, or striking child with open or closed hand. Criticism included verbal expression of disapproval of the child, or their activities or choices.

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Data coders were trained by a master coder to an 80% criterion across all codes for five consecutive observations prior to independently coding data. Two coders independently coded 24% of all sessions to calculate interobserver agreement (IOA) using an interval-by-interval calculation method. IOA calculated for individual parenting behaviors is as follows: inappropriate commands 80%, lack of follow through 77%, positive consequences for inappropriate behavior 97%, physical aggression 100%, criticism 99%. IOA for child negative verbalizations was 95%. Overall reliability for child noncompliance was 65%, with intervals for child noncompliance deemed reliable if two coders coded the proportion of compliance within .10 of one another (i.e., total reliability at or within 10% for each rater).

Variables of Interest

Observed parenting behaviors and child problem behaviors. Two inappropriate parent behavior composites were created. The first, Inconsistent Parenting, included parenting commands and included the proportion of intervals with any instances of inappropriate commands and/or lack of follow-through with commands. These inconsistent parenting practices have been demonstrated to be associated with problem behaviors in children (Patterson, 1982; Snyder, 1977) The second composite, Harsh and Coercive Parenting, included the proportion of intervals with any instances of positive consequences for inappropriate child behavior, aggression, and/or criticism. The associations between harsh and coercive parenting strategies and later conduct and problem behavior in children who are typically developing has been well-documented in the literature (Patterson, 1982; Scaramella & Leve, 2004). Additionally, research has also suggested that inconsistent parent can affect discipline practices (Shaw et al., 2003).

Observed child problem behaviors included negative verbalizations and noncompliance, both common behavioral concerns for preschool-aged children. Consistent with a developmental

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progression of behavior problems in children, we would expect a higher prevalence of verbal aggression than physical aggression at the age of children in the current sample, due to the development of verbal and other communication skills (Liu et al., 2013; Patterson, 1982).

Reported child problem behavior. *T*-scores on the Externalizing Problems score of the CBCL were used to quantify caregivers' reports of child problem behavior. The Externalizing Problems score is a continuous, quantitative variable.

Family contextual factors. Poverty level for the present study and was determined from the U.S. Department of Health and Human Services (U.S. DHHS, 2015). Thresholds were calculated using the 2015 poverty guidelines (when the original study was initiated), based on reported household income and total number of people in the household. This information was used to determine whether families fell below or at/above the 100% poverty level threshold, which are values that have been used in previous research with young children and DD (Holtz et al., 2015; Mitchell, & Hauser-Cram, 2009). Caregiver education level was dichotomized based on self-reported levels of education to include those with or without a college degree.

Procedures

The procedure for the observed parent-child interactions included 10-minutes of free play, a two-minute clean up task, and a three-minute structured activity task with the caregiver and their child. During the free play task, parents and children were provided with a standardized set of toys (e.g., blocks, figurines, pretend food, etc.) and were instructed to play as they normally would play. This task sought to observe parent-child interactions during an unstructured, play activity. During the clean-up task, participants were instructed to return the play materials to the storage container. The purpose of the clean-up task was to observe caregiver-issued commands and resulting child compliance (or non-compliance). The rate of

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commands was not controlled for, given our interest in better understanding how commands and child compliance varied within the sample. The final task was the structured activity task, in which participants were provided with three activities (e.g., puzzles, stacking rings) and instructed to choose an activity to complete together. Tasks were chosen that had a clear end and structure, where parents and their child were required to work together to complete the activity. A one-minute warning was provided to participants prior to the end of each task.

Data Analysis

IBM SPSS Statistics 25 was used to analyze the data for the current study. Descriptive statistics and multiple regression analyses were used to address the research questions. Several multiple regression analyses were conducted for research questions 2-4 to examine the extent to which observed parenting behaviors were associated with both observed (e.g., through structured observations) and reported (e.g., CBCL) child behaviors. Each model included child age, child primary diagnosis, primary caregiver education level, and poverty level, in addition to specific independent variables associated with each research question. Child age was a continuous variable, reported in months. Child primary diagnosis was dummy coded (1 = speech/language delay; 0 = global delay or ASD). Caregiver education was dummy coded (1 = bachelor's degree or higher; 0 = less than a bachelor's degree). Poverty level was determined based on the guidelines discussed above and was dummy coded (1 = below poverty threshold; 0 = at or above poverty threshold).

Results

Descriptive Statistics for Parenting Behaviors

Means and standard deviations were used to examine parenting behaviors across the three tasks of the parent-child observation as well as separated out by parenting behavior during each

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task. Correlations and descriptive statistics for child and parent behaviors are presented in Table 2. Raw data are presented, without modification or transformation.

Number of commands. The number of commands was only calculated during the two-minute clean-up task when parent-delivered commands were expected. During the two-minute clean-up, caregivers delivered an average of 18 commands ($M = 18.04$, $Mdn = 16.00$, $SD = 11.00$), or approximately nine commands per minute. There was considerable variability, with the number of commands ranging from 0–62 during the two-minute clean-up task.

Inappropriate commands and/or lack of follow through. Overall, caregivers engaged in inappropriate commands and/or lack of follow through during an average of 41% of intervals across all three tasks ($M = 0.41$, $SD = 0.18$). Inappropriate commands and/or lack of follow through were most prevalent during the clean-up task (78% of intervals; $M = 0.78$, $SD = 0.27$), compared to the free play activity (33% of intervals; $M = 0.33$, $SD = 0.20$) or structured activity (45% of intervals; $M = 0.45$, $SD = 0.29$).

Positive consequences for inappropriate behavior, aggression, and/or criticism. Overall, caregivers engaged in positive consequences for inappropriate behavior, aggression, and/or criticism in approximately 3% of intervals across all three tasks ($M = 0.03$, $SD = 0.05$). These parenting behaviors were most common during the clean-up task (9% of intervals; $M = 0.09$, $SD = 0.21$), compared to the free play activity (1% of intervals; $M = 0.01$, $SD = 0.04$) or structured activity (4% of intervals; $M = 0.04$, $SD = 0.13$).

Parenting Behavior and Associations with Child Problem Behaviors

Child noncompliance. To address research question 2, a multiple regression analysis was conducted to examine if caregivers' use of inappropriate commands and/or lack of follow through explained unique variance in child noncompliance. Table 3 presents results of the

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multiple regression analysis accounting for observed child noncompliance. The model was statistically significant, $F(6, 177) = 11.27, p < .001$, and accounted for 28% of the variance in child noncompliance ($R^2 = .28$). Of the predictors, the number of commands delivered by caregivers was the strongest, significant predictor, ($\beta = 0.40, p < .001$), followed by child age ($\beta = -0.25, p < .001$). The relation between the number of commands delivered by caregivers and child noncompliance was positive, indicating more commands delivered by caregivers was associated with increased noncompliance in children. Additionally, the relation between child age and noncompliance was negative, which suggests that younger child age was associated with increased noncompliance.

Observed child problem behavior. To address research question 3, another multiple linear regression analysis was conducted to determine if harsh and coercive parenting behavior (aggression, criticism, and/or positive consequences for inappropriate behavior) accounted for unique variance on child negative vocalizations. Table 4 presents results of the multiple regression analysis accounting for observed child problem behavior. The model was significant, $F(5, 178) = 3.29, p = .007$, and accounted for approximately 9% of the variance in children's observed problem behavior ($R^2 = .09$). Within the model, the proportion of intervals with caregiver's use of harsh and coercive parenting practices (positive consequences for inappropriate behavior, criticism, and/or aggression) was significant ($\beta = 0.28, p < .001$). This relationship was positive, indicating that harsh and coercive parenting was associated with more child negative vocalizations.

Reported child problem behavior. To address research question 4, a multiple regression analysis was conducted to determine if harsh and coercive parenting behavior (use of aggression, criticism, and/or positive consequences for inappropriate behavior) explained unique variance on

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parent-reported externalizing problem behavior, as evidenced by the Externalizing Problems Scale on the CBCL. Table 5 shows that the model was significant, $F(5, 178) = 3.34, p = .007$, and accounted for approximately 9% of the variance in children's externalizing behavior scores ($R^2 = .09$). Observed harsh and coercive parenting behavior did not account for significant variance on parent-reported behavior problems. Within the model, child and family characteristics, including the presence of a speech/language delay ($\beta = -0.17, p < .05$) and caregiver education ($\beta = -0.17, p < .05$) were significantly associated with CBCL Externalizing Problems. The relationship between child primary diagnosis and caregiver education and child behavior problems was negative, suggesting that children with a speech/language delay (compared to children with other DDs) and caregivers with at least a four-year college degree were associated with lower levels of problem behavior.

Discussion

The present study contributes to the existing literature on associations between parenting behaviors and challenging behaviors in young children and adds to a dearth in literature to focus an examination of these factors on families with young children with DD. Few studies have focused on children with DD and even fewer have utilized observational data collected in the home. The present study's focus on early childhood represents an important time when behavior problems often emerge (Baker et al., 2003). Parent-child interactions can take on coercive patterns during this time, which may increase the likelihood of the development of externalizing patterns of behavior in typically developing children (Patterson, 1982). It is important to understand the extent to which similar associations are evident in young children with DD.

A significant contribution of the present study is the demonstrated associations between observed parenting behaviors and observed behavior problems in young children with DD. We

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found that child noncompliance was associated with number of parent-administered commands and child age. Additionally, higher instances of harsh or coercive parenting behaviors were associated with higher rates of observed behavior problems in children, but not reported problem behaviors. There are a few potential explanations for the differences in direct observations versus parent report. First, observations conducted by researchers during 15-minute activities represent a snapshot of both caregiver and child behaviors. Caregivers who completed the CBCL were asked to provide ratings of their child's behavior over the last several months. The wide scope of the CBCL is likely to impact the caregiver's view of their child's behavior to a longer period and encompasses a larger sample of behaviors across a variety of contexts (e.g., within the community at stores, during transitions between activities, at others' homes, etc.), significantly different than what is obtained through a 15-minute direct observation of parent-child interactions. Additionally, the ratings provided on behavioral rating scales, like the CBCL, are subjective, but provide some anchors (e.g., "Not true," "Sometimes true," or "Always true") to support raters with ways to guide their ratings. Research has yielded mixed results on the correlations between challenging behavior reported by caregivers and observed problem behaviors. For example, Stormshak et al. (1997) found low correlations between scores on the CBCL and direct observations of children during a clinic intake, while Robinson and Eyberg (1981) found high correlations between observations of children and reported problem behaviors.

McLoyd (1990) described parenting behavior as the single most proximal factor associated with problem behaviors in typically developing children. A similar relationship was found within the current study, with caregivers' use of harsh or coercive parenting behaviors significantly predicting observed child behavior problems in children with DD, after controlling for child diagnosis, parent education, poverty, and child age. Standardized beta weights from the

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model suggested that for approximately every $\frac{1}{4}$ standard deviation increase in caregivers' harsh or coercive parenting behaviors, an associated approximate $\frac{1}{4}$ standard deviation increase in problem behaviors in children was observed. Despite these harsh and coercive parenting behaviors occurring infrequently across all tasks (approximately 3% of all intervals), the model still accounted for a significant amount of variance in observed child behavior and represented a medium effect size ($R^2 = .09$), reflecting the importance of these parenting behaviors on child challenging behavior. These results are consistent with previous research on caregivers' increased use of harsh and coercive parenting practices that are associated with increased behavior problems in children (Chadwick et al., 2008; Scaramella & Leve, 2004; Zubizarreta et al., 2019). While data were collected during a single point in time, these interactions may represent a snapshot in time of what Patterson (1992) described as the coercion cycle, which includes mutually reinforcing, coercive interactions between caregivers and their children. These coercive interactions were observed most often during the clean-up task. Difficult tasks that have previously been associated with problem behaviors in children may set the stage for coercive interactions. Caregivers may change their behavior to avoid problem behaviors exhibited by children, while children may display problem behaviors to avoid or escape from undesired tasks.

A second significant contribution of the present study is the data obtained on base rates of directly observed parenting behaviors during parent-child interaction tasks with young children with DD. The current study provides information related to a significant gap in literature about how often parents of young children with DD engage in specific parenting behaviors, such as coercive interactions, harsh parenting, or the frequency or types of commands that are delivered. Caregivers engaged in harsh or coercive behaviors (i.e., providing positive consequences for inappropriate behavior, engaging in aggression, and/or using criticism) at the highest rates during

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the clean-up task. Caregivers engaged in inappropriate commands and/or lack of follow through with commands in 41% of intervals across all tasks. Again, the clean-up task was associated with the highest rate of these undesired parenting behaviors (e.g., inappropriate commands and/or lack of follow through), which found that 78% of intervals included inappropriate commands and/or lack of follow through by caregivers. During this two-minute clean up task, caregivers delivered on average 18 commands, with a range between 0 to 62 commands. Child noncompliance increased as the number of commands delivered by caregivers increased.

This study also focused on family factors and individual characteristics of children. In addition to the inclusion of caregivers' parenting behavior and the relationship to behavior problems in children found in the present study, family factors and child characteristics were also included in each model to determine their association with child problem behaviors. Across all models, family poverty was not found to be a significant predictor of child problem behaviors, which differs from previous studies that have found associations between poverty level and behavior problems in children (Duncan et al., 1994). It is possible because this was a relatively low-income sample, that we did not detect associations between poverty and child behavior. The presence of a communication delay (compared to other global delays) and higher caregiver education level was associated with only reported problem behaviors in children.

Implications

The results of this study support parenting interventions that target positive parenting strategies to improve child compliance and strengthen positive parent-child relationships. Intervention to improve these positive relationships aim to reduce the likelihood of caregivers using harsh, punitive, or coercive strategies (Dishion et al., 2012; Eyberg, 1988; Forgatch et al., 2004; Webster-Stratton & Reid, 2018). Interventions that focus on reducing the number of

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commands delivered by caregivers and setting appropriate limits by focusing on commands that allow caregivers to follow through with an appropriate consequence (either praise or often guided compliance) may be especially beneficial. Additionally, a focus on developmentally appropriate, behavioral family interventions is relevant, given the findings of the current study. Child age was a significant predictor of child noncompliance only when considered with number of commands delivered by caregivers. As child age increased and number of commands decreased, child noncompliance decreased. This finding is important and highlights the needs for families to use language that their child understands when delivering commands. Researchers have modified existing behavioral parenting curricula to focus on the unique parenting needs that come with parenting a child with DD (McIntyre, 2008).

Limitations

Despite the contributions from the present study to existing literature on the associations between parenting behavior and behavioral problems in children with DD, the present study is not without limitations. First, the study is cross-sectional in design and was drawn from a larger, longitudinal, randomized controlled trial study. As such, the current study limits the measurement to associations between variables at a single point in time and lack a causal inference. Despite this limitation, the present study does contribute to an understudied area of the relationship between parenting behaviors and the development of problem behaviors in children with DD and sets the stage for future research to understand how these parenting behaviors develop over time and influence behavior problems in children with DD.

Secondly, predictors and outcomes for both children and caregivers focused on negative, or undesired outcomes. We did not explore associations between desired parenting behaviors in caregivers and either improvements in challenging behavior or prosocial, desired behaviors in

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children. Ideally, associations between undesired parenting and child behaviors should be viewed along with associations between desired, positive parenting behaviors and prosocial, or positive child behaviors. Additionally, associations between parenting behaviors and internalizing problems in children were not explored in the current study.

It is also relevant to bring attention to the participants within the current sample and to what extent the results are generalizable to the larger population. The current sample was taken from a larger, longitudinal study from one geographical region in the Northwestern United States. Children and caregivers were predominantly White (approximately 90% and 88%, respectively). Research has also consistently documented sex differences in children with DD, with a higher prevalence of boys with DD than girls (Zablotsky et al. 2019). Parenting behaviors, family relationships, and parenting beliefs differ across cultures. These may relate to use and views related to discipline (Deater-Deckard et al., 1996), parental warmth and positive parenting, or expectations for child behavior (Dishion & Stormshak, 2007). Caregivers were recruited from the larger study by the inclusion criteria of identifying as a primary caregiver for the child participants. Given this, a majority (over 92%) of primary caregivers were female, which is consistent with previous research within DD (Feldman et al., 2007) and over 75% of the sample did not possess a college degree. Given these limitations, it is important for the results of the present study to be compared with results for future studies that include families of diverse backgrounds, cultures, and socioeconomic status (e.g. education, poverty level, etc.) to examine the impact these differences may have on parenting beliefs and behaviors.

While demographic information was collected about participants, additional information on children and their families would be useful. For example, direct cognitive or language testing was not conducted on children. This information would be useful to better characterize the

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sample and potentially allow for additional covariates within the included models. Observations were not collected on interactions with the caregivers and other members of the family (e.g., siblings), nor was information on behavioral problems in siblings collected. Within literature on typically developing children, research has found that targeted parenting interventions for children with behavioral problems can generalize to other siblings, resulting in reductions in behavioral problems (Price et al., 2015). Robinson and Eyberg (1982) found improvements in observed compliance for siblings of treated children using behavioral parent training. Future research should examine the extent to which undesired parenting behaviors observed for children with developmental delays are also observed for siblings of these children.

Lastly, as previously discussed, several limitations also exist within the measurement systems to examine child and caregiver behaviors. A strength of the current study is that child behavior was measured both through direct observation and reported by caregivers. However, the sensitivity of using the Externalizing Problems scale of the CBCL may have too broadly examined child behavioral problems to detect significant associations with specific parenting behaviors, while 15-minute observations may be too narrow. Additionally, the PCBOS coding system utilized a 30-second partial interval recording method to calculate the proportion of intervals with given target behaviors, with no transformations made during the analyses. While proportions seek to control for various durations of observations for target behaviors, few occurrences of target behaviors can greatly influence total proportion of intervals with target behaviors in samples with few intervals. IOA was also significantly lower for child noncompliance than for other behaviors. A potential reason for this lower IOA score is that noncompliance was coded based off a command issued by a caregiver. Some commands issued by caregivers were ambiguous or unclear, which was a variable of focus for the current study, as

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well as previous research (Eyberg, 1988; Robinson & Eyberg, 1981), which may have affected reliability coding IOA on child noncompliance when parent commands were unclear.

Future Directions

Future studies could employ a developmental psychopathology perspective by using longitudinal designs to understand the transactional nature between both caregiver's parenting behavior and problem behavior in children with DD, as well as positive parenting behaviors and positive, or prosocial child behaviors. Future research could also examine associations between parenting behaviors and internalizing behavior problems in children with DD. Research with typically developing adolescents has found significant associations between parenting behaviors (e.g., parental warmth and hostility) and internalizing problems (McKee et al., 2008) and also in young children, with higher levels of over-involved parenting predicting higher internalizing problems scores in a sample of typically developing 2-year-old children (Bayer et al., 2006).

Conclusion

Limitations notwithstanding, the present study adds to the extant literature on the associations of parenting behaviors on children's problem behavior. Noncompliance in children was significantly associated with the number of commands delivered by caregivers and observed problem behaviors in children were significantly associated with caregiver's use of harsh and coercive parenting behaviors. Parenting behavior, unlike contextual factors such as poverty and parent education, are amenable to intervention. Thus, prevention or early intervention of child problem behavior in young children with DD could naturally involve supporting caregivers to use strategies that are demonstrated to be effective with improving behavioral outcomes in children.

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Table 1

Demographic Information for Children and Caregivers (N = 180)

| Characteristic | <i>M or %</i> | <i>SD</i> |
|--------------------------------|---------------|-----------|
| Child | | |
| Age (months) | 36.96 | 4.66 |
| % Male | 75.60 | |
| % White* | 91.70 | |
| % Hispanic* | 15.00 | |
| % Native American* | 11.10 | |
| % Developmental delay* | 15.00 | |
| % Autism spectrum disorder* | 13.30 | |
| % Communication delay* | 53.30 | |
| CBCL externalizing problems | 58.52 | 12.90 |
| Caregiver | | |
| Age (years) | 32.37 | 7.20 |
| % Female | 92.20 | |
| % White* | 88.30 | |
| % Hispanic* | 11.70 | |
| % Native American* | 7.20 | |
| % Employed full time | 18.90 | |
| % Below 100% poverty threshold | 43.89 | |
| % With college degree | 23.90 | |

Note. CBCL = Child Behavior Checklist, * = values may exceed 100% due to endorsement or present of multiple responses.

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Table 2

Bivariate Correlations and Descriptive Statistics for Family, Child, and Parenting Behavior Variables (N = 178)

| Variable | <i>M</i> | <i>SD</i> | S-W | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|----------|-----------|--------|-----|-------|-------|-------|--------|------|---|
| 1. CBCL Externalizing | 58.52 | 12.90 | .99 | - | | | | | | |
| 2. Number of commands | 18.04 | 11.00 | .92*** | .07 | - | | | | | |
| 3. Inconsistent Parenting ¹ | .41 | .18 | .99 | .09 | .56** | - | | | | |
| 4. Harsh and coercive ¹ | .03 | .05 | .61*** | .12 | .20** | .18* | - | | | |
| 5. Child noncompliance ¹ | .67 | .28 | .93*** | .06 | .45** | .30** | .19** | - | | |
| 6. Child negative verbal ¹ | .11 | .13 | .74*** | .09 | .11 | .20** | .29** | .31** | - | |
| 7. Child age (months) | 36.96 | 4.66 | .95*** | .08 | -.10 | -.14 | -.08 | -.31** | -.02 | - |

Note. * $p < .05$, ** $p < .01$., *** $p < .001$ ¹ = Numbers depicted as a proportion. S-W = Shapiro-Wilk statistic. Inconsistent Parenting =

Inappropriate commands and/or lack of follow through; Harsh and Coercive Parenting = Positive consequences for inappropriate behavior, aggression, and/or criticism.

Table 3

Multiple Regression for Noncompliance in Children with DD (N = 178)

| Variable | <i>B</i> | <i>SE B</i> | β |
|---|----------|-------------|----------|
| Constant | 1.04 | 0.16 | |
| Communication delay | -0.07 | 0.04 | -0.12 |
| Caregiver college degree | -0.01 | 0.04 | -0.01 |
| Poverty level | 0.02 | 0.04 | 0.04 |
| # Of commands | 0.01 | <0.01 | 0.39*** |
| Inappropriate commands/lack of follow through | 0.05 | 0.12 | 0.03 |
| Child age | -0.02 | <0.01 | -0.25*** |
| R^2 | | .28 | |
| F | | 11.27*** | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. *B* and β = unstandardized and standardized beta weights, respectively.

Table 4

Multiple Regression for Observed Problem Behavior in Children with DD (N = 179)

| Variable | <i>B</i> | <i>SE B</i> | β |
|---|----------|-------------|---------|
| Constant | 0.10 | 0.08 | |
| Communication delay | -0.01 | 0.02 | -0.06 |
| Caregiver college degree | -0.01 | 0.02 | -0.03 |
| Poverty level | <0.01 | 0.02 | 0.01 |
| Positive consequences, aggression, and/or criticism | .75 | 0.20 | 0.28*** |
| Child age | <0.01 | <0.01 | 0.01 |
| <i>R</i> ² | | .09 | |
| <i>F</i> | | 3.29*** | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. *B* and β = unstandardized and standardized beta weights, respectively.

Table 5

Multiple Regression for Reported Problem Behavior in Children with DD (N = 179)

| Variable | <i>B</i> | <i>SE B</i> | β |
|---|----------|-------------|---------|
| Constant | 49.94 | 7.69 | |
| Communication delay | -4.25 | 1.88 | -0.17* |
| Caregiver college degree | -5.10 | 2.31 | -0.17* |
| Poverty level | 1.19 | 1.95 | 0.05 |
| Positive consequences, aggression, and/or criticism | 27.15 | 19.76 | 0.10 |
| Child age | 0.30 | 0.20 | 0.11 |
| R^2 | | .09 | |
| F | | 3.34*** | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. B and β = unstandardized and standardized beta weights, respectively.