



# The effects of developmental quotient and diagnostic criteria on challenging behaviors in toddlers with developmental disabilities<sup>☆</sup>

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## ABSTRACT

Previous research has found that individuals with intellectual disability and/or autism spectrum disorder (ASD), and those with greater symptom severity within these diagnoses, show higher rates of aggressive/destructive behavior, stereotypic behavior, and self-injurious behavior. In this exploratory cross-sectional study, toddlers at-risk for a developmental disorder ( $n = 1509$ ) ranging from 17 to 36 months fell into one of three diagnostic categories: Autistic Disorder, Pervasive Developmental Disorder-Not Otherwise Specified [PDD-NOS], and atypically developing – no ASD diagnosis. Mental health professionals from EarlySteps, Louisiana's Early Intervention System, interviewed parents and guardians using the *Baby and Infant Screen for Children with aUtism Traits (BISCUIT) – Part 3* (Matson, Boisjoli, & Wilkins, 2007) to obtain measures of challenging behaviors and the *Battelle Developmental Inventory, 2nd Edition (BDI-2)* (Newborg, 2005) to obtain developmental quotients (DQ). Toddlers diagnosed with Autistic Disorder or PDD-NOS showed a positive relationship between total DQ and challenging behavior; whereas, atypically developing toddlers with no ASD diagnosis showed a more adaptive, negative relationship. The DQ domains that were most influential on challenging behaviors varied by diagnosis, with communication and motor domains playing greater roles for toddlers with Autistic Disorder or PDD-NOS, and personal-social and cognitive domains playing greater roles for atypically developing toddlers with no ASD diagnosis.

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## 1. Introduction

Although a clear consensus on what constitutes a challenging behavior does not presently exist (Elgie & Hastings, 2002; Holden & Gitlesen, 2009), these behaviors are generally defined as those which significantly interfere with learning, skill performance, and social interactions, while also potentially causing physical harm to the self and/or others (Emerson, 2005; Emerson et al., 2001; Mudford et al., 2008). Examples of such behaviors include physical aggression, self-injurious behavior (SIB), stereotypy, property destruction, and verbal aggression. Despite these behaviors not being unique to individuals with developmental disabilities, they are remarkably prevalent within this population, with prevalence estimates reaching above 80% in some samples (Matson, Wilkins, & Macken, 2009; Poppes, van der Putten, & Vlaskamp, 2010). To date, the majority of research in this area has focused on individuals with intellectual disability (ID) and/or autism spectrum disorder (ASD), with

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school-aged children and adult participants comprising the majority of samples (e.g., Matson, Wilkins, et al., 2009; McCarthy et al., 2010; Tarbox et al., 2009). In particular within these populations, it has been found that those individuals with comorbid diagnoses of ID and ASD engage in greater rates of challenging behaviors than individuals with ID alone (Matson & Rivet, 2008; Rojahn, Wilkins, Matson, & Boisjoli, 2010).

With respect to this comorbidity, the effect of the level of intellectual impairment on the presentation of challenging behaviors within individuals with ASD has been explored. Among children with ASD, McTiernan, Leader, Healy, and Mannion (2011) found that lower IQ was associated with an overall increase in the frequency of aggression, stereotypy, and SIB, as well as an increase in the severity of stereotypy and SIB. Similarly, when examining a sample of children, adolescents, and adults, Holden and Gitlesen (2006) found overall rates of challenging behaviors rose with increasing levels of intellectual impairment. However, within this sample, specific topographies of challenging behavior followed different trends among the varying levels of ID; individuals with mild to moderate ID were more likely to engage in physically aggressive behaviors, while individuals with severe to profound ID were more likely to engage in SIB. Other researchers have corroborated this finding, which suggests that individuals with mild to moderate ID present with more outwardly aggressive and destructive behaviors while those with severe to profound ID evince more self-directed or sustained challenging behaviors, such as SIB and stereotypies (Cooper et al., 2009; Koskentausta, Iivanainen, & Almqvist, 2007; Murphy, Healy, & Leader, 2009; Witwer & Lecavalier, 2008). Yet, other researchers have failed to substantiate all of these findings by noting a lack of a relationship between sets of challenging behaviors and level of ID (Murphy et al., 2009). Therefore, while it is generally accepted that a decrease in intellectual functioning is associated with an overall increase in challenging behaviors, the details regarding which specific topographies of challenging behaviors are affected are somewhat less clear, though likely in the aforementioned directions.

In addition to the examination of varying levels of intellectual impairment on challenging behaviors amongst individuals with ASD, differences in the presence of challenging behaviors among individuals with and without ASD diagnoses and also between different ASD diagnoses have also been found. When comparing individuals with ASD to those without ASD (e.g., ID, atypically developing), researchers have consistently found that those with an ASD diagnosis present with significantly more challenging behaviors overall (Baghdadli, Pascal, Grisli, & Aussilloux, 2003; Kozlowski & Matson, 2012; Matson & Rivet, 2008). Furthermore, researchers have also established that individuals with more severe ASD symptoms or more severe forms of ASD (i.e., Autistic Disorder) evince significantly more challenging behaviors than those with less severe symptomatology or less severe forms of ASD (i.e., Pervasive Developmental Disorder-Not Otherwise Specified [PDD-NOS]) (Jang, Dixon, Tarbox, & Granpeesheh, 2011; Kozlowski & Matson, 2012; Matson & Rivet, 2008). This relationship has been found to exist across many topographies of challenging behavior, including aggressive behaviors, SIB, and stereotypies.

While researchers have found that children and adults with greater symptom severity of ASD present with greater rates of challenging behavior (e.g., Jang et al., 2011), and that comorbid ID is associated with an even further increase in these rates with greater intellectual impairments correlating with higher rates of challenging behavior (e.g., Cooper et al., 2009), the precise relationship between these two disabilities has yet to be examined closely. That is, given the common co-occurrence of ASD and ID (Matson & Shoemaker, 2009) as well as the frequent presence of challenging behaviors among both populations, could one diagnosis be moderating the relationship between the other diagnosis and challenging behavior? Furthermore, since the vast majority of studies examining challenging behavior presentation within the ID and ASD populations has been focused on school-aged children and adults, the question of whether or not level of intellectual impairment and severity of ASD symptomatology has the same effect upon toddlers has not been addressed.

Therefore, the purpose of the present study was to examine the effect of overall developmental quotient (DQ) on challenging behavior presentation in toddlers with varying levels of ASD symptomatology according to diagnosis (i.e., Autistic Disorder, PDD-NOS, and atypically developing – no ASD diagnosis). In addition to this, the specific domains of DQ were examined to determine which facets of developmental impairment were most associated with challenging behaviors for individuals with particular diagnoses.

## 2. Method

### 2.1. Participants

Seven hundred and five cases were removed from the dataset due to missing data on the main variables, incorrect data, or ages beyond those appropriate for the standardized, normed measures. This transformed the original sample size from 2214 to 1509. The participants were caregivers of toddlers with developmental disabilities. Caregivers consisted mainly of biological mothers (81.7%), but also included biological fathers (2.8%), biological grandparents (5.2%), step-parents and foster/adoptive parents (4.6%), and unidentified or other caregivers (5.7%). The toddlers ranged in age from 17 to 36 months ( $M = 25.7$ ,  $SD = 4.7$ ), height from 12 to 48 inches ( $M = 33.3$ ,  $SD = 4.0$ ), and weight from 14 to 52 pounds ( $M = 28.7$ ,  $SD = 5.3$ ). There were 1070 males (70.9%), 434 females (28.8%), and 5 children who did not have gender identified. The ethnicity of the children was reported to be Caucasian (48.4%), African American (40%), Hispanic (2.2%), or other/unidentified (9.4%). At the time of the assessments, all of the children were receiving services through EarlySteps, Louisiana's Early Intervention System under the Individuals with Disabilities Education Act, Part C, which provides services to infants and toddlers and their families from birth to 36 months. To qualify for services through EarlySteps, children must be diagnosed with a developmental delay or a medical condition that puts them at risk for a developmental delay.

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