



Stereotyped behaviors predicting self-injurious behavior in individuals with intellectual disabilities



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ABSTRACT

We examined the relation between stereotyped behavior and self-injurious behavior (SIB) for 1871 individuals with intellectual disabilities who had a score of >0 on the Behavior Problem Inventory (BPI-01; Rojahn et al., 2001). We report three main findings: First, structural equation modeling techniques (SEM) revealed that the BPI-01 stereotyped behavior subscale scores predicted BPI-01 SIB subscale scores. Second, when stereotyped behavior was modeled as a predictor of SIB, mixture-modeling techniques revealed two groups of individuals: one in which stereotyped behavior was a strong, statistically significant predictor of SIB (69% of the sample), and another one in which stereotyped behavior was not a predictor of SIB (31%). Finally, two specific stereotyped behavior topographies (i.e., body rocking and yelling) were identified that significantly predicted five different SIB topographies (i.e., self-biting, head hitting, body hitting, self-pinching, and hair pulling). Results are discussed in terms of future research needed to identify bio-behavioral variables correlated with cases of SIB that can, and cannot, be predicted by the presence of stereotyped behavior.

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Self-injurious behavior (SIB) refers to self-directed acts that either cause immediate tissue damage or they have the potential¹ to do so if left untreated (Rojahn, Schroeder, & Hoch, 2008). The most common SIB topographies among individuals with intellectual disabilities (ID) are head banging, body hitting, self-biting, and self-scratching, but depending on the definition of SIB they also include less prevalent behaviors such as, hair pulling, gouging and air swallowing (aerophagia) (Rojahn et al., 2008). Individuals with ID and autism are especially vulnerable to develop SIB at some point in their life showing higher SIB prevalence rates than their typically developing counterparts (e.g., Baghdadli, Pascal, Grisi, & Aussiloux, 2003; Bodfish, Symons, Parker, & Lewis, 2000; Kozlowski & Matson, 2012; McClintock, Hall, & Oliver, 2003; Oliver, Murphy, & Corbett, 1987). Point-prevalence studies indicate that SIB occurs in approximately 10% to 12% of individuals with ID in general (Didden et al., 2012). Rojahn et al. (2008) estimated that the prevalence of SIB in individuals with mild ID may be 4%, in those with moderate ID 7%, in severe ID 16%, and 25% in individuals with profound ID. SIB prevalence tends to be higher in childhood and adolescence as compared to older age groups (Rojahn et al., 2012a). However, the SIB prevalence in a

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¹ This definition of SIB refers to firmly established, often chronic behavior (as opposed to emerging proto-injurious behavior) that would cause tissue damage without ongoing treatment.

general ID population is difficult to determine because it depends so heavily on factors such as level of ID, age, sex, and etiology of ID and others (and complex interactions among them). Non-injurious stereotyped behaviors, which can be described as atypical, idiosyncratic, and repetitive behaviors such as body rocking, hand flapping, spinning, and hand clapping are also very common in the ID population (Berkson, Tupa, & Sherman, 2001; Bodfish et al., 1995; Murphy, Hall, Oliver, & Kissi-Debra, 1999; Rojahn, Matlock, & Tassé, 2000). Stereotyped behavior is quite common in individuals with ID. Didden et al. (2012) estimated that perhaps as much as 50% of the population may demonstrate one or more stereotypic response topographies.

Many studies have shown a high probability of a concurrence of SIB and stereotyped behavior. For instance, Rojahn et al. (2012a) reported a Spearman correlation between the SIB and stereotyped behavior frequency ratings of 0 on the Behavior Problem Inventory (BPI-01; Rojahn, Matson, Lott, Esbensen, & Smalls, 2001) in 1122 individuals; 744 had a positive SIB subscale score (i.e., a score of 1 or larger), and 955 had a positive Stereotyped Behavior subscale score. Given the high prevalence of both behaviors in that population, a correlation between SIB and stereotyped behavior may be simply a function of chance and does not necessarily imply a functional relationship. Guess and Carr (1991) provided persuasive conceptual and empirical evidence in support of their proposition that some cases of stereotyped behavior and SIB first emerge as developmentally delayed, repetitive motor behaviors that initially serve a homeostatic function in under- or over-stimulating environments, and later may become sensitive to socially mediated contingencies such as access to caregiver attention. However, speculations that some cases of SIB may be causally (or functionally) related to stereotyped behavior have a long history in the empirical literature on chronic SIB (e.g., Baumeister & Forehand, 1973; Baumeister & Rollings, 1976).

In one of the first studies on the early development of SIB, Murphy et al. (1999) asked teachers from several special education classes for children with severe ID or autism below the age of 11 years to identify those who were “beginning to show early SIB” (p. 149) according to a list of nine specific SIB topographies (which, interestingly, were taken from an earlier but quite similar version of the BPI-01 (Rojahn et al., 2001) that is the basis of the current study). Seventeen children comprised the SIB index group; the control group consisted of 14 children without any signs of emerging SIB and matched on age and ambulation. While the index children showed indeed more potential SIB, there was also a significant overlap between the groups with regard to percent duration of potential SIB, suggesting the difficulties inherent in reliably identifying initial or early onset of SIB. After that, behavior observations of the index group were repeated for 18 months in 3-month intervals. Clear SIB escalations were found for some of those children, but not for all. Using regression analyses (except for earlier teacher concerns about behavior problems) none of several other independent variables, including early stereotyped behavior, were found to predict SIB. In a subsequent study Hall, Oliver, and Murphy (2001) focused on four of those children that had exhibited escalating SIB over the 18 months observation period. They found a significant association between early SIB and low levels of social contact from teachers. The authors hypothesized that this association may be a risk marker for the exacerbations of SIB.

The term *proto-injurious behavior*, introduced by Berkson, Tupa, and Sherman (2001), refers to certain types of stereotypic behaviors or non-repetitive, discrete bouts of behavior that may lead to topographically similar forms of SIB. Proto-injurious behavior is viewed as a potential risk marker for emerging SIB (Furniss & Biswas, 2012; Langthorne & McGill, 2008; Petty, Allen, & Oliver, 2009; Richman & Lindauer, 2005; Symons, Sperry, Dropik, & Bodfish, 2005) under the assumption implied in the term that the intensity or frequency of that proto-injurious behavior may be shaped such that it ultimately causes tissue damage. It also implies that some kind of topographic similarity between the proto-injurious behavior and the subsequent SIB should exist. In addition to the Hall et al. (2001) study just mentioned several other studies have provided evidence of the proto-injurious behavior hypothesis for some topographies of SIB. Berkson et al. (2001) examined body rocking and SIB in 39 young children between the ages of 3 and 40 months with severe disabilities in a longitudinal study. Twenty-one of the participants exhibited proto-SIB and/or SIB, while 10 displayed proto-SIB alone. The authors concluded that some proto-SIBs seemed to lead to SIBs of similar topographies. Richman and Lindauer (2005) followed emerging patterns of SIB in very young children with moderate-to-profound developmental delays. They confirmed that the majority of the proto-SIB remained topographically unchanged as they morphed into SIB for some of the children that developed SIB during the course of the study. Similarly, Petty et al. (2009) studied the temporal relationship between stereotypic, proto-injurious, and self-injurious behaviors in six children with intellectual disabilities and also found that stereotyped behavior was a precursor to proto-SIB and that proto-SIB in turn was a precursor to SIB in all of the children assessed.

However, not all studies provided empirical evidence in support of the proto-injurious stereotyped behavior hypothesis, at least if proposed as an exclusive description of how SIB may develop. Kurtz, Chin, Huete, and Cataldo (2012), for instance reported that most of the young children in their sample of 32 either showed stereotypic behaviors and SIB simultaneously or they exhibited SIB only. Therefore, they concluded that SIB in their sample of children did not emerge from stereotypic behavior. A certain limitation of this study was, however, that the data for documenting the emergence of stereotyped behavior and SIB were based exclusively on parental report. In other words, it is unclear at this point whether and under what conditions certain stereotyped behavior may be precursors of certain proto-injurious behaviors and whether and under what circumstance proto-injurious behavior can be a precursor to SIB.

In the current study, we examined whether the construct of stereotyped behavior (represented by a subscale score across many different stereotyped behavior topographies) can predict the construct of SIB (represented by a subscale score across many different SIB topographies). Second, after a stereotyped behavior construct was indeed found to be predictive of SIB, we

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