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Review article

Self-injurious behavior in people with profound intellectual disabilities: A meta-analysis of single-case studies

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ABSTRACT

The limitations people with profound intellectual disabilities experience in functioning contribute to a vulnerability to self-injurious behavior. Since this problem behavior has important negative consequences for people concerned, examining the effectiveness of treatments is important. In the current meta-analysis, single-case studies investigating non-aversive, non-intrusive forms of reinforcement were combined using hierarchical linear models. This analysis revealed that the average effect of treatment was relatively large and statistically significant. Further, significant variance was observed between both studies and participants. In addition, some evidence was found for a moderator effect of sensory impairment. Finally, no statistically significant moderator effects of medication, motor impairment, setting, age, gender, matching of treatment with behavioral function and contingency were found.

Contents

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1. Introduction

Self-injurious behavior can be defined as behavior that causes physical injury to the individual's own body (Tate & Baroff, 1966). Multiple studies report that self-injurious behavior is highly prevalent in people with intellectual disabilities. Depending on the methodology, the definition of self-injurious behavior and/or the composition of the sample, the reported prevalence rates vary from 1.7 to 93% (Borthwick-Duffy, 1994; Cooper et al., 2008; Emberson & Walker, 1990; Hillery, 1999; Rojahn & Esbensen, 2006).

This vulnerability to engage in self-injurious behavior is related to the limitations people with intellectual disabilities experience in cognitive, socio-emotional, communicative, personality, sensory-motor and adaptive functioning (Došen, Gardner, Griffiths, King, & LaPointe, 2007; Gardner, Graeber-Whalen, & Ford, 2001). The three-dimensional paradigm, which we further explain below, should therefore be placed in a developmental perspective (Došen et al., 2007).

Tate and Baroff (1966) emphasize the physical consequences of the behavior, i.e. the physical injury. Also the measures that are undertaken to control the self-injurious behavior can have physical (e.g. muscular atrophy, demineralization of bones) and social (e.g. prevention of opportunities to engage in activities) consequences (Fisher, Piazza, Bowman, Hanley, & Adelinis, 1997; Gardner & Sovner, 1994). Self-injurious behavior further not only may impede physical and social development, but may also interfere with community participation (Gardner & Sovner, 1994; Rojahn & Esbensen, 2006). Exhibiting self-injurious behavior therefore hampers a person's quality of life (Schalock, 2004; Symons, Koppekin, & Wehby, 1999). Furthermore the self-injurious behavior elicits negative emotional reactions and stress and can thus influence the quality of life of direct care staff, teachers, professionals and other family members (Mosseman, Hastings, & Brown, 2002). Finally this challenging behavior has financial implications: the cost of care and treatment can run high (Gardner & Sovner, 1994).

It is thus not surprising that scientists and clinicians continually seek more effective and efficient treatments. The current emphasis on evidence based practice may contribute to the flow of research about this topic. Many of these studies concern applied behavior analysis (Iwata, Roscoe, Zarcone, & Richman, 2006). Since in this approach the behavior of the individual participant is central, the use of a single-subject design is assumed to be in line with its goals (Bailey & Burch, 2002).

The findings of studies based on applied behavior analysis have been summarized in reviews, differing in their focus. In some reviews treatment effects are examined in the broad category of challenging behavior (e.g. Grey & Hastings, 2005). Other reviews investigate the treatment of self-injurious behavior with a specific target population (e.g. Olson & Houlihan, 2000), a specific topography (e.g. Cannella, O'Reilly, & Lancioni, 2006) or a specific intervention (e.g. Carr et al., 2000). Kahng, Iwata, and Lewin (2002) provide a quantitative analysis of behavioral research on self-injurious behavior in people with developmental disabilities. They notice that most treatments are highly effective. Further they observe that the use of punishment has decreased. This trend coincides with the debate about the use of aversive and intrusive treatments (Bihm, Sigelman, & Westbrook, 1997; Murphy, 1993; Susan, 1996; van Oorsouw, Israel, von Heyn, & Duker, 2008).

Yet, to our knowledge, no review focusing on the effect of non-aversive and non-intrusive forms of reinforcement on self-injurious behavior in people with profound intellectual disabilities exists. In addition, few studies examine the overall effect of treatment and/or the influence of potential moderators. Those who do are somewhat dated (e.g. Sternberg, Taylor, & Babkie, 1994) or are restricted to a specific type of intervention (e.g. Carr, Severtson, & Lepper, 2009). Moreover, single-case studies are typically excluded from quantitative reviews. Yet, recent advances in meta-analytic techniques allow for combining single-case study results using hierarchical linear models (Van den Noortgate & Onghena, 2003a, 2003b).

Therefore the aim of the present study is to statistically combine single-case experiments concerning the effect of non-aversive and non-intrusive reinforcement on self-injurious behavior in people with profound intellectual disabilities. Using meta-analytic techniques we want to shed light on following questions:

- What is the overall effect of non-aversive, non-intrusive reinforcement on self-injurious behavior in participants with profound intellectual disabilities?
- What are the differences between studies?
- What are the differences between participants?
- What characteristics of studies and participants influence the effect of treatment?

The fourth question includes an investigation of moderator effects, which can be defined as interactions between an independent variable and a quantitative or qualitative variable that specifies the appropriate conditions for its operation (Holmbeck, 1997).

Based on the three-dimensional paradigm, a first set of potential moderators was put forward. This approach assumes biological, psychological and environmental factors are involved in the onset of problem behavior. In addition, factors on the biological, psychological and environmental level may act as instigating, processing and maintaining conditions (Došen, 2007; Gardner & Sovner, 1994). More specifically, we found evidence in the literature that several characteristics may influence the effect of treatment:

First, the treatment of self-injurious behavior may be improved by the integration of the behavioral and biomedical approach (Deleon, Rodriguez-Catter, & Cataldo, 2006). Therefore, the effect of the treatment can be expected to be larger if