



Review article

Psychosocial interventions for reducing vocal challenging behavior in persons with autistic disorder: A multilevel meta-analysis of single-case experiments



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ABSTRACT

Vocal challenging behavior (VCB) forms a common problem in individuals with autistic disorder. Since VCB is associated with negative outcomes for the individual and his or her environment, it is important to know how to manage this type of CB. To evaluate the effectiveness of several psychosocial interventions applied to decrease VCB in individuals with autistic disorder, we conducted a meta-analysis of single-case experiments (SCEs). Fifty-two SCEs, including 74 participants, were combined using a multilevel meta-analysis. The overall treatment effect was large and statistically significant. However, the effect varied significantly over the included studies and participants. Examining this variance, evidence was found for a moderator effect of VCB type and intervention type, with, on average, the largest effects for interventions used to reduce VCB including stereotypical VCB and for interventions containing both antecedent and consequence components. Age, gender, primary treatment setting, publication year, and study quality did not significantly moderate the intervention effect.

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Contents

1. Introduction	4516
2. Methods	4518
2.1. Systematic and comprehensive search for evidence	4518
2.1.1. Inclusion and exclusion criteria	4518
2.1.2. Systematic search process	4518
2.1.3. Selected studies and reliability	4518
2.2. Data extraction	4519
2.2.1. Case and study characteristics	4519
2.2.2. Treatment effectiveness	4519
2.2.3. Reliability of coding	4519
2.3. Data analysis	4519
2.3.1. Standardization and descriptive analysis	4519
2.3.2. Multilevel meta-analysis of single-case experiments	4519

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3.	Results	4520
3.1.	Three-level model	4520
3.1.1.	Three-level model without moderators	4520
3.1.2.	Three-level models with moderators	4521
3.2.	Sensitivity analysis	4522
3.3.	Publication bias analysis	4524
4.	Discussion	4524
	References	4532

1. Introduction

Individuals with autistic disorder present an impaired or abnormal development in social interactions, communication, and/or symbolic play that is manifest before the age of three years. They have qualitative deficits in social skills and communication and show repetitive, stereotyped patterns of behavior, interests, and activities (American Psychiatric Association, 2000; World Health Organization, 2013). Especially these deficits in social skills, language and communication, and the rigid behaviors make them vulnerable to develop challenging behaviors (CB; Buschbacher & Fox, 2003; Howlin, 1998). Besides, persons with autistic disorder often present intellectual disabilities (ID) and/or co-occurring psychopathologies, factors that increase the risk of CB (Helverschou, Bakken, & Martinsen, 2011; Holden & Gitlesen, 2009; Matson & Shoemaker, 2009). A common form of CB in individuals with autistic disorder is *vocal challenging behavior* (VCB). Examples are vocal stereotypy, verbal aggression, inappropriate vocalisations, and screaming (Cohen, Yoo, Goodwin, & Moskowitz, 2011; Healy & Leader, 2011; Lequia, Machalick, & Rispoli, 2012).

The literature about the causal and maintaining factors of VCB is very limited and is often restricted to the operant and the homeostatic function of (vocal) stereotypy (e.g., Cunningham & Schreibman, 2008; Hodgetts, Magill-Evans, & Misiaszek, 2011). Sometimes, the neurobiology of (vocal) stereotypy is discussed (e.g., Langen, Durston, Kas, van Engeland, & Staal, 2011; Miguel, Clark, Tereshko, & Ahearn, 2009). Occasionally, the impaired perspective taking, imagination, and language development are mentioned as contributing factors to VCB in persons with autistic disorder (e.g., Hetzroni & Tannous, 2004; Norris & Dattilo, 1999). Hence, for a comprehensive understanding of the onset and maintenance of VCB in individuals with autistic disorder, we ground on the biopsychosocial model of Došen, Gardner, Griffiths, King, and Lapointe (2007). This is a descriptive model, pointing the attention to different biological (e.g., pain, sleep irregularities), psychological (e.g., experiences of distress, anxiety), and environmental (e.g., lack of structure, attention) factors that may be involved in the onset of CB and/or psychiatric disorders. They can function as instigating, processing, and maintaining conditions. This biopsychosocial paradigm has to be placed in a developmental perspective since a person's cognitive, emotional, social, and personality development and his or her functional skills influence the way he or she experiences and reacts to events. For example, a school-aged child with autistic disorder (i.e., psychiatric disorder) who has no functional speech (i.e., impaired development in communication) can feel very distressed (i.e., psychological factor) during unexpected changes (i.e., environmental factor) and can start screaming (i.e., VCB). Moreover, the teacher's attention to the screaming (i.e., environmental factor) can reinforce the screaming of the child (i.e., psychological mechanism of operant conditioning), which can increase the VCB.

Although VCB does not immediately cause physical harm like for instance self-injurious behavior (cf. Emerson, 2001), it is associated with negative outcomes for the individual concerned and for his or her environment. VCB may impede a person from learning and social interactions and can be socially stigmatizing (e.g., Keeling, Smith Myles, Gagnon, & Simpson, 2003; MacDonald et al., 2007). It may hinder peers (e.g., Liu-Gitz & Banda, 2010) and can involve stress for parents, teachers, therapists, and staff (cf. Hastings, 2002, 2005; Tomanik, Harris, & Hawkins, 2004). VCB thus affects the quality of life of the individual and of his or her environment (cf. Schalock, 2004). Consequently, it is important to know how to manage this type of CB.

Managing VCB forms a specific challenge. To start, VCB cannot be physically stopped or interrupted (Lanovaz & Sladeczek, 2012). In addition, several authors report the difficulty of assessing and treating automatically maintained vocal stereotypy (e.g., Athens, Vollmer, Sloman, & Pipkin, 2008; Rapp, 2007). The produced sensory reinforcers are rather inaccessible for parents, teachers, or therapists who want to diminish the behavior (Vollmer, 1994). Furthermore, individuals with autistic disorder have sometimes very limited communicative skills and language capacities. Hence, teaching alternative verbal responses can be difficult (Franco et al., 2009; Hutchins & Prelock, 2013). Besides, it could happen that interventions intended to reduce VCB simultaneously decrease positive behavior (e.g., appropriate vocalisations), which is not desirable (Lanovaz & Sladeczek, 2012).

Today, several interventions including psychological and/or social components (cf. Došen, 2007; Došen et al., 2007), like for instance differential reinforcement (DR), response interruption and redirection (RIRD), and augmentative and alternative communication (AAC) are applied to reduce VCB in persons with autistic disorder (e.g., Franco et al., 2009; Lanovaz & Sladeczek, 2012). These *psychosocial interventions* have been evaluated in multiple primary-level studies. Except from some group studies including also persons with other autism spectrum disorders (ASD; e.g., Gabriels et al., 2012), to the best of our knowledge, all the published primary-level articles on this topic concern *single-case experiments* (SCEs).

In SCEs, causal relationships between independent and outcome variables are studied within one entity or case by manipulating the independent variables and conducting repeated measurements of the outcome variables under the

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