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Promoting constructive engagement by two boys with autism spectrum disorders and high functioning through behavioral interventions

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ABSTRACT

We assessed a behavioral intervention-based strategy to promote constructive engagement and to reduce stereotyped behaviors by two boys with autism spectrum disorders and high functioning. The program included two functional activities for each participant (i.e. coloring and using a personal computer with a multimedia software for reading and writing) according to a multi-elements baseline design, during classroom. Both participants showed a preference for the computer activity during the choice phase. Results showed an increasing of constructive engagement, according to both functional activities, and a reduction of stereotyped behaviors during intervention phases for both participants. Psychological as well as practical implications of the findings are discussed.

1. Introduction

Autism spectrum disorders (ASD) are neuro-developmental disabilities and core of generalized pervasive developmental impairments characterized by cognitive, social, emotional and communication inabilities. ASD are described with challenge and stereotyped behaviors (Matson & Smith, 2008). Children with ASD usually show a large variability in communication and social skills: some of them can communicate using complete sentences, others use single words to express basic needs, and some others will never speak. Some of them remain aloof while other ones will be affectionate and interested in interacting with people and surrounding objects (Ben-Itzchak & Zachor, 2007). In addition, all the children with ASD usually show very little or no eye contact and have difficulties reading and understanding people's facial expressions and body language. Moreover, variability also concerns responses to interventions: some children achieve limited or no progress in target behaviors while others rapidly attain relevant results (Peters-Scheffer, Didden, Korzillius, & Sturmey, 2011). Among intervention strategies, several studies focused at improving (a) social skills, crucial to establish social relationship in everyday life (Rao, Beidel, & Murray, 2008; Reichow & Volkmar, 2010; Wang, Parrila, & Cui, 2013), and (b) adaptive skills, in order to enhance constructive engagement in children with high functioning ASD (Chang, Lung, Yen, & Yang, 2013; Love, Carr, Almason, & Ingeborg Petursdottir, 2009; Palmen, Didden, & Lang, 2012).

Independent functioning represents an essential issue for children with ASD and high functioning. As mentioned above, those children may have difficulties to establish social relationship with other children, to engage with academic and/or recreational activities, to live autonomously (Eaves & Ho, 2008), and they need to rely on continuous support from parents and caregivers (Farley et al., 2009). Nonetheless, studies concerning adaptive activities in those children pointed out

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discrepancies between level of adaptive skills and IQ scores. Thus, adaptive capacities seem to be lower than those predictable by cognitive level of functioning, as measured by standardized intelligence scales (Kenworthy, Case, Harms, Martin, & Wallace, 2010). Furthermore, those discrepancies would increase with age (Kanne et al., 2011). The latter point justify a large body of literature across the lifespan on adaptive and social skills for people with high-functioning ASD (Koegel, Vernon, & Koegel, 2009). Most of the studies used behavioral interventions based on techniques for people with or without intellectual disabilities, such as task analysis, modeling, prompting, self management and positive reinforcements (Begeer et al., 2011; Wang et al., 2013). Literature reviews on behavioral strategies suggest that early interventions are particularly promising and successful on ASD children's challenge behaviors and social skills (Didden et al., 2008; Makrygianni & Reed, 2010).

In a recent review, Matson, Hattier, and Belva (2012) pointed out the relevance of behavioral strategies aimed at improving adaptive skills in adolescent and adults with ASD. Those strategies resulted to be highly effective, and authors suggested that adaptive living skills should be investigated more intensively, given their impact on lifespan, on quality of life and on autonomous functioning. Studies reviewed focused largely on participants with ASD and intellectual disabilities, and it is noteworthy that research on persons with ASD and high functioning is lacking (for a review, see Palmen et al., 2012). Additional research is needed on the efficacy of behavioral interventions for the latter group.

Among rehabilitation programs for persons with ASD, a growing interest has been given to the presentation of stimulation conditions (Hill, Trusler, Furniss, & Lancioni, 2012). There has been an interest for music stimulation, which provides sensory input, but does not necessarily require constructive engagement by participant (Lanovaz, Sladeczek, & Rapp, 2011; Lanovaz & Sladeczek, 2011). An appropriate intervention program should foster both the increase of stimulation input and the enhancement of constructive engagement (Kazdin, 2001; Stasolla & Caffò, 2013). The effects of such intervention are expected to reduce (a) isolation and/or passivity, and (b) stereotyped behaviors. Activities such as coloring, using the computer, sorting objects, may be viewed as helpful to pursue these rehabilitation goals.

The present study was aimed to assess the effectiveness of a stimulation program with two boys with ASD and high functioning who presented stereotyped behaviors. Particularly, an academic activity (i.e. using personal computer for reading and writing) was compared with (a) a conventional stimulation condition (i.e. coloring pictures familiar to the boys, and (b) a baseline condition in which no specific activity/stimulation was programmed. A choice opportunity was then allowed between the computer use and the picture coloring activity. Eventually the condition more frequently chosen by each participant was retained and then compared with baseline condition. The objectives of the study concerned (a) the increasing of constructive engagement and (b) the reduction of stereotyped behaviors during intervention phases (Cunningham & Schreibman, 2008).

2. Method

2.1. Participants

Bud and Martin were 8 and 7 years old at the beginning of the study and were diagnosed with severe ASD at childhood autism rating scale (CARS) (Rellini, Tortolani, Trillo, Carbone, & Montecchio, 2004) with scores of 40 and 42, respectively. Although no formal Intellectual Quotient scores were available, they were both estimated, by clinical observations, as borderline between normal and mild intellectual disabilities. The participants attended to a regular classroom with a special training and were able to communicate their personal needs, although their language were not easily understandable. They presented with frequent off task behaviors, especially linked to stereotyped behaviors (i.e. hand related movements, sound and noises production, withdrawal), relationship problems with peers, and had no resilience to frustration, showing aggressive behaviors against people surrounding them. Bud and Martin were autonomous on basic needs (i.e. personal hygiene), although they continuously needed reminders to be on task. They were recruited for the study through reporting by a neurologist. Their families considered the intervention program highly desirable and signed a formal consent for the participation of Bud and Martin to the research. The Review Board of the Institution approved the study protocol, and the whole study was performed in accordance with the Helsinki Declaration and its later amendments.

2.2. Setting, activities and data collection

The study was carried out in the classroom. The participants' desk was arranged with a laptop equipped with a multimedia interactive software, a series of preferred pictures and colored markers. The two activities selected for the study consisted of (a) coloring preferred and familiar pictures to the participants and (b) using a personal computer equipped with an interactive software to learn reading and writing. Those activities represented the most grateful ones by both participants and the most suitable ones in the school setting according to both parents' and teachers' interviews. Data recording concerned Bud and Martin's stereotyped behaviors, constructive engagement (i.e. appropriate use of the materials) and choices between activities. The first two measures were recorded according to a partial interval system, in which 10 s of observation were followed by 5 s of scoring (Lancioni et al., 2007, 2010). Inter-rater agreement was assessed in 20% of sessions of each phase (see below Section 2.3) between two independent research assistants. The percentages of agreements (checked out separately for the two measures by dividing the number of agreements by the total of intervals and multiplying by 100) were between 90 and 100% with a mean of 94% for both measures. Two research assistants were involved to record