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# The effectiveness of a cross-setting complementary staff- and parent-mediated early intensive behavioral intervention for young children with ASD

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ABSTRACT

We compared the effects of Early Intensive Behavioral Intervention (EIBI) and eclectic intervention in children with ASD on autism severity, developmental performance, adaptive behavior, language skills and challenging behaviors. Twelve children received cross-setting staff- and parent-mediated EIBI of centre-based one-to-one and play sessions as well as home-based sessions, including continuous parent training and supervision. A comparison group of 10 children received eclectic intervention. Standardized tests were carried out independent examiners at intake and after 6 months. The groups were equivalent on key variables at intake. The intervention group outperformed the eclectic group in measures of autism severity, developmental and language skills. Scores on adaptive behaviors revealed comparable changes in both treatment groups. Furthermore, the intervention group reduced challenging behaviors, a progress facilitated by parents that achieved treatment fidelity and gained competence to manage challenging behavior functions. Descriptive data of treatment progress showed that parental treatment provision and treatment fidelity gains indicated differential child progress in outcomes and skill mastery in learning environments. Our results show the effectiveness of a staff- and parent-mediated EIBI program for children with ASD. These findings highlight the importance of generalization across settings and persons for improving functional behavior in various learning environments that result in reduced problem behaviors and increased language and communication skills.



## 1. Introduction

Early intervention outcome of children with autism spectrum disorder (ASD) has been widely addressed. Meta-analysis and meta-analytic reviews agreed that there is substantial evidence for the effectiveness of Early Intensive Behavior Intervention (EIBI) in producing improvements in various skills (Eldevik et al., 2009; Makrygianni & Reed, 2010; Peters-Scheffer, Didden, Korzilius, & Strumey, 2011). In particular, intervention outcome studies found EIBI to be superior to an

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eclectic integration of several intervention approaches, in producing progress in cognitive abilities, adaptive skills (Eldevik, Eikeseth, Jahr, & Smith, 2006; Eikeseth, Smith, Jahr, & Eldevik, 2007; Eikeseth, Smith, Jahr, & Eldevik, 2002; Perry et al., 2008; Reed, Osborne, & Corness, 2007; Smith, Groen, & Wynn, 2000), and autism severity (Zachor & Ben Itzchak, 2010; Zachor, Ben Itzchak, Rabinovich, & Lahat, 2007). However, the efficiency of EIBI as an intensive application of Applied Behavior Analysis (ABA) principles over standard care ranges from not adequate (Spreckley & Boyd, 2009) to sufficient (Reichow & Wolery, 2009). Several other studies demonstrated early intensive behavioral intervention to be effective when provided in typical community settings (Cohen, Amerine-Dickens, & Smith, 2006; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Remington et al., 2007). Remington et al. (2007) addressed two crucial questions: the influence of treatment on diagnostic autism core symptoms and the effects of intensive treatment on family core members. Although the authors demonstrated a lack of increased parental stress and relative improvements in pro-social behaviors, such changes on parent-reported child behavior problems and autistic behaviors were not found. Studies that compared the effects of early intervention implemented either in a clinic- or parent-directed model were not conclusive in identifying which approach was more effective. Smith et al. (2000) found weekly provided 25 h of centre-based treatment was more effective than a less intensive 5 h a week intervention based on parent-training. In contrast, Sallows and Graupner (2005) did not find marked differences between clinic- and parent-directed treatments. Overall, the fact remains that outcomes of effectiveness studies are strongly influenced by the inherent heterogeneity of autism spectrum disorder with a variety of variables likely affecting a child's response to treatment. Most studies focused on child factors and/or treatment factors. Well-established child factors includes the age at the initiation of treatment, with younger children yielding better outcomes (Granpeesheh, Dixon, Tarbox, Kaplan, & Wilke, 2009; Harris & Handleman, 2000; Perry et al., 2011), cognitive ability at intake with moderate relation of initial IQ to outcome (Eikeseth et al., 2002, 2007; Harris & Handleman, 2000; Hayward, Gale, & Eikeseth, 2009; Sallows & Graupner, 2005), adaptive behaviors at intake with children that have better initial adaptive levels tending to have better outcomes, and autism severity at intake accurately predicting "rapid responders" to treatment (Remington et al., 2007; Sallows & Graupner, 2005). In summary, research conducted on child factors as outcome predictors are inconsistent. Studies that address treatment itself for prediction of child outcomes mainly comprise treatment intensity with high-intensity treatments producing better outcomes (Reed et al., 2007). However, meta-analysis demonstrated that raising intensity above 25 h did not produce significant increases in the maintenance of developmental gains (Makrygianni & Reed, 2010), parental stress reduced positive child outcomes in high time-input treatments (Osborne, McHugh, Sounders, & Reed, 2008), and treatment fidelity demonstrated that parent's valid administration of teaching techniques leads to the maintenance of child's mastery of skills and lasting behavior changes in children with ASD (Vismara, Colombi, & Rogers, 2009).

Nevertheless, besides notions of methodological limitations that may reduce the internal validity of studies conducted such as group assignment and choice of outcome measures and, therefore, question outcome and its predictors (see Kasari, 2002), these results yield several practical considerations in treatment provision to be addressed and integrated in efficient treatment planning. The integration of treatment programs with different teaching strategies, environments and treatment providers in comprehensive EIBI is a necessary requirement for providing treatments across settings and persons. It is essential that any treatment should have effects which generalize in such a way as to maintain the outcome benefits in multiple settings. To do this it is essential not only to integrate a variety of treatment methods but to integrate them in a systematic way.

The purpose of this study was to describe the preliminary results of a subsample participating in a comprehensive cross-setting staff- and parent-mediated EIBI program (Fava & Strauss, 2011). This cross-setting EIBI program systematically addressed the question how correlated treatment features are successfully integrated to achieve: (a) treatment provisions in structured, quasi-naturalistic and natural settings, (b) treatment provisions across staff and parents, (c) intensive staff and parent training in order to gain treatment fidelity, and (d) integration of treatment strategies to target skill levels appropriately and to coordinate skill training across developmental domains.

Our preliminary findings were used to address the following questions:Did children within the first 6 months of a cross-setting staff- and parent-mediated EIBI program significantly change on diagnostic, developmental and language outcome measures, and what was the range of progress compared to a comparison group following an eclectic approach?Did problem behaviors significantly decrease because functional behavioral assessments of the child's challenging behaviors were systematically included in strategy planning?Since parents were constantly included in treatment provisions and, therefore, were intensively trained and supervised, did parents validly apply treatment strategies and to what extent did this training reduce parental stress?How was a child's direct measure of behavior change – namely mastery of behavior targets – influenced by parent inclusion in treatment provision and parent training gains in treatment fidelity?

## 2. Methods

### 2.1. Procedures

The participants were 22 children diagnosed with autistic disorder or pervasive developmental disorder—not otherwise specified (PDD-NOS). Potential participants in the cross-setting staff- and parent-mediated EIBI program were referred by a child neuropsychiatry unit of a regional pediatrician hospital. Diagnosis for all 22 children was made independently of the study by external neuro-psychiatrists and child psychologists who conducted additional cognitive, language and adaptive assessments at intake and follow-up after 6 months. After diagnosis and behavioral assessments, the decision of a child's treatment referral was dependent on parental preference. Children from parents that requested parental participation in