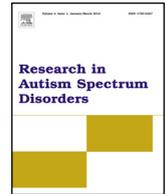




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Contents lists available at ScienceDirect

Research in Autism Spectrum Disorders

journal homepage: <http://ees.elsevier.com/RASD/default.asp>

Relations between specific and global outcome measures in a social-communication intervention for children with autism spectrum disorder



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ARTICLE INFO

Article history:

Received 21 January 2016

Received in revised form 5 May 2016

Accepted 17 May 2016

Number of reviews completed is 2

Available online 10 June 2016

Keywords:

Autism spectrum disorders

Social communication

Treatment

Intervention

Outcome measures

Brief observation of social communication change (BOSCC)

Children

Joint engagement

ABSTRACT

Assessment of relevant outcomes is a key challenge in evaluating effects of social-communication interventions. However, few studies have investigated in what ways specific and more global measures may influence reported results of social-communication interventions for children with autism spectrum disorder (ASD). In this study both a specific and a global, more global autism symptom measure were used to assess effects of a brief social-communication intervention. Fifty-nine children (2–4 years) diagnosed with autistic disorder were assessed with the Joint Engagement (JE) states coding procedure and a preliminary version of the Brief Observation of Social Communication Change (BOSCC). A statistically significant difference was found between intervention and control groups from baseline to intervention endpoint on JE but not on BOSCC. Degree of change on the measures was moderately related, and both were independent of language level and non-verbal mental age. This study adds to the knowledge of what may be expected of different outcome measures and provides suggestions to how measures may be deployed to investigate underlying mechanisms and developmental pathways.

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1. Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social communication and interaction as well as restricted and repetitive patterns of behaviours (APA, 2013). The disorder is thought to be caused by complex interactions between genes and environmental factors, but it remains unclear how this interplay influences the behavioural phenotype (Hallmayer et al., 2011; Sandin et al., 2014). Epidemiological studies report worldwide prevalence of ASD to be somewhere within the range of 50–70 per 10 000 (Elsabbagh et al., 2012; Fombonne, Quirke, & Hagen, 2011) although some studies report prevalence estimates close to 120 per 10 000 in regions in the UK and

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the US (Baird et al., 2006; Kogan et al., 2009). Thus, ASD is today recognized as one of the more common developmental disorders.

There has been a substantial increase in ASD related research during the past two decades, including research on early identification and intervention (Charman, 2011; Dawson & Bernier, 2013; Lecavalier, 2016). Knowledge in these areas is important, as an early start for intervention is thought to be crucial for modification of areas of impairments affecting the developmental trajectories of children with ASD (Bradshaw, Steiner, Gengoux, & Koegel, 2015; Webb, Jones, Kelly, & Dawson, 2014). Although results from intervention studies are mixed (Fletcher-Watson, McConnel, Manola, & McConachie, 2014; Howlin, Magiati, Charman, MacLean, 2009; Oono, Honey, & McConachie, 2013), some studies have reported improvement in areas of social-communication functioning (e.g. Green et al., 2010; Kasari, Paparella, Freeman, & Jahromi, 2008; Kaale, Fagerland, Martinsen, & Smith, 2014; Warreyn & Roeyers, 2014; Wetherby et al., 2014).

Interventions aiming to enhance social communication in children with ASD often target a specific set of behaviours or abilities (e.g. joint attention, imitation, shared engagement), but it is implied that gains in specific functioning may lead to improvements in more global autism symptoms (Mundy, Sigman, & Kasari, 1994; Yoder, Bottema-Beutel, Woynaroski, Chandrasekhar, & Sandbank, 2014).

The choice of terminology here is important. Yoder et al. (2014) proposed a matrix where outcome measures were described as “context-bound” as opposed to “generalized”, and “proximal” as opposed to “distal”, in relation to the intervention tested. The generalized/context-bound dichotomy relates to whether the measurement process was tied to the therapeutic context or not. The proximal/distal dichotomy relates to how far (in an implied linear manner) the evaluated skill lies from the taught skill. Instead, we use the terms “specific” and “global”. This is because the transition between the two measurement tools explored in this study represents a broadening of measured traits from a more narrow range directly related to the intervention target, to a wide range representative of the entire constellation of characteristics used in autism diagnosis.

Most studies of the effects of social-communication interventions utilize outcome measures that are specific and related to the intervention targets (Yoder et al., 2014). However, a few high quality social-communication intervention studies have also examined change in global autism symptoms (e.g. Green et al., 2010; Wetherby et al., 2014). The studies indicate different findings derived from specific outcome measures compared to global outcome measures. For instance, Green et al. (2010) conducted a large scale RCT testing the effect of a parent-mediated social-communication intervention, using Autism Diagnostic Observation Schedule-Generic social communication scores (ADOS-G: Lord et al., 2000) as the primary outcome measure. They found that the intervention group improved on symptom scores. However, as improvements were also present in the control group, the treatment effect was statistically non-significant. Nevertheless, significant treatment effects were found on ‘blinded’ measures more closely related to intervention targets, such as parent interaction style and children’s communication initiations to their parent. This is in line with the review by Yoder et al. (2014) where results showed more positive effects of intervention studies using outcome measures specific to intervention targets (e.g. Early Social Communication Scales (ESCS: Mundy et al., 2003)), compared to more global measures (e.g. ADOS: Lord, Rutter, DiLavore, & Risi, 1999).

There is a huge variety of outcome measures employed in autism intervention studies (Bolte & Diehl, 2013; Cunningham, 2012), and these measures differ on multiple aspects, not only whether the measures capture specific or more global aspects of behaviour (Fletcher-Watson & McConachie, 2015; Green et al., 2010). For example, outcome measures may be directly-observed versus informant reports; based on standardised assessment, curriculum-based assessment or free play; amenable to blind rating or not; independent of general developmental level, or not; and designed and proven to be responsive to change over time, or not.

Despite the variety of procedures available, it is clear that to the extent that change in more global outcomes is anticipated, intervention studies should include measures that capture broader aspects of child functioning. This is important to strengthen the validity and importance of conclusions regarding the impact of the intervention on behaviours beyond specific treatment targets

It seems intuitively correct that measures capturing skills and behaviours that are specific to treatment targets may be more sensitive to detection of changes compared to more global measures. However, there is a lack of empirical investigation of this notion, the review by Yoder et al. (2014) being an exception.

In this report, we review two measures closely matched on the criteria listed above (i.e. both directly observed, from a free-play sample, blind rated and designed to capture change over time) which differ in their specificity to the intervention targets.

1.1. The specific measure

Measures that focus on change in specific behaviours or skills related to the social-communication domain include, among others, the ESCS (Mundy et al., 2003) and the Communication and Symbolic Behavior Scales–Developmental Profile (CSBS-BP; Wetherby & Prizant, 2002). Although not coding discrete behaviours directly, the Joint Engagement States coding procedure (JE; Bakeman & Adamson, 1984) is another measure that seems to have increasing status as an appropriate outcome measure in evaluation of social-communication interventions for young children with ASD. This coding procedure was developed to measure the quality of the interaction between adult and child through identification of six mutually exclusive engagement states; unengaged, on-looking, person engagement, object engagement, supported joint engagement

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