Vineland-II adaptive behavior profile of children with attention-deficit/hyperactivity disorder or specific learning disorders

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ABSTRACT

Background: The evaluation of adaptive behavior is informative in children with attention-deficit/hyperactivity disorder (ADHD) or specific learning disorders (SLD). However, the few investigations available have focused only on the gross level of domains of adaptive behavior.

Aims: To investigate which item subsets of the Vineland-II can discriminate children with ADHD or SLD from peers with typical development.

Methods and procedures: Student's t-tests, ROC analysis, logistic regression, and linear discriminant function analysis were used to compare 24 children with ADHD, 61 elementary students with SLD, and controls matched on age, sex, school level attended, and both parents' education level.

Results: Several item subsets that address not only ADHD core symptoms, but also understanding in social context and development of interpersonal relationships, allowed discrimination of children with ADHD from controls. The combination of four item subsets (Listening and attending, Expressing complex ideas, Social communication, and Following instructions) classified children with ADHD with both sensitivity and specificity of 87.5%. Only Reading skills, Writing skills, and Time and dates discriminated children with SLD from controls.

Conclusions: Evaluation of Vineland-II scores at the level of item content categories is a useful procedure for an efficient clinical description.

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What this paper adds

The unique contribution of this study can be summarized as follows. (1) For the first time, the adaptive behavior profile of children with ADHD or SLD has been investigated using the updated Vineland-II. (2) Rigorous strategies have been used to

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establish equivalence (i.e., matching) of children with and without ADHD or SLD and to rule out the effects of other variables that could influence adaptive behavior. (3) The analyses went beyond the Vineland-II total domain and subdomain scores and considered specific item subsets to help in diagnosis and intervention.

1. Introduction

Adaptive behavior has been defined as the collection of learned "conceptual, social, and practical skills" (Luckasson et al., 2002) performed by people in their everyday lives (Schalock et al., 2010; Tassé et al., 2012). The Vineland Adaptive Behavior Scale (VABS; Sparrow, Balla, & Cicchetti, 1984) has been proposed as one of the most valid and reliable tools for the evaluation of adaptive behavior skills (Balboni, Pedrabissi, Molteni, & Villa, 2001; Schalock et al., 2010). These properties have been confirmed for the revised second (Vineland-II; Sparrow, Cicchetti, & Balla, 2005) and third (Vineland-3; Sparrow, Cicchetti, & Saulnier, 2016) editions. The four scales of Communication, Daily Living Skills, Socialization, and Motor Skills allow for the measurement of all adaptive behavior skills, as well as motor skills, by means of a semi-structured interview with the individual's caregiver.

Traditionally, the assessment of adaptive behavior has been associated with a diagnosis of intellectual disability disorder (Heber, 1961; Schalock et al., 2010). However, the assessment has also proved useful for planning personalized treatments for individuals with other disorders, for instance, autism spectrum disorder (e.g., Balboni, Tasso, Muratori, & Cubelli, 2016; Kanne et al., 2011).

The evaluation of adaptive behavior also appears to be informative in children with attention-deficit/hyperactivity disorder (ADHD) or specific learning disorder (SLD), both neurodevelopmental disorders (Leigh, 1987; Roizen, Blondis, Irwin, & Stein, 1994). ADHD is characterized by a persistent pattern of inattention, disorganization, and/or hyperactivity-impulsivity, which interferes with functioning or development (American Psychiatric Association, 2013). Social dysfunctions and difficulties in social communication are generally associated with ADHD (Nijmeijer et al., 2008), starting in early childhood and in most cases persisting into adolescence and adulthood (Barkley, Fischer, Smallish, & Fletcher, 2002). Recently, deficits in social cognition and pragmatic language have been suggested as causes of these social dysfunctions (Caillies, Bertot, Motte, Raynaud, & Abely, 2014; Staikova, Gomes, Tartter, McCabe, & Halperin, 2013; Uekermann et al., 2010). SLD concerns difficulties in learning and using academic skills (e.g., reading, writing, and mathematics), and affects academic and occupational performance and/or daily life activities (American Psychiatric Association, 2013).

Although deficits in adaptive behavior are considered peripheral in ADHD and SLD, they can provide additional information about the underlying disorder and may be useful in diagnostic and therapeutic stages. However, very few studies have investigated the adaptive behavior profile of children with ADHD or SLD, and findings are far from conclusive (e.g., Clark, Prior, & Kinsella, 2002; Ditterline, Banner, Oakland, & Becton, 2008).

Typically, investigations of adaptive behavior in ADHD have involved comparisons of children with ADHD and peers with other disorders occurring in isolation or associated with ADHD. The main aim was to identify the adaptive behavior domains that distinguish ADHD from the other pathologies, e.g., autism spectrum disorder (Ashwood et al., 2015; Magnúsdóttir, Saemundsen, Einarsson, Magnússon, & Njardvik, 2016; Stein, Szumowski, Blondis, & Roizen, 1995), oppositional defiant/conduct disorder (Clark et al., 2002), obsessive compulsive disorder (Sukhodolsky et al., 2005), or prenatal alcohol exposure (Crocker, Vaurio, Riley, & Mattson, 2009).

In just few studies, children and adolescents with ADHD or SLD have been compared with peers with typical development. Participants with ADHD showed delays in all three domains of conceptual, social, and practical adaptive behavior skills (Clark et al., 2002; Crocker et al., 2009; Sukhodolsky et al., 2005). In contrast, children with SLD showed deficits that were specific to the conceptual adaptive behavior domain and affected all areas related to functional academic skills (Fagerlund et al., 2012; Leigh, 1987). However, to investigate the adaptive behavior profile deeply, some methodological concerns should be addressed.

To understand the adaptive behavior of children with behavioral and cognitive impairments, researchers should match the profiles of these children with those of typically developing peers on the relevant socio-demographic variables (i.e., age, sex, socio-cultural level, and school level attended). As suggested by Kover and Atwood (2013) and Steiner, Cook, Shadish, and Clark (2010), for each matching variable, equivalence between the clinical and control groups should be based not only on p values, but also on effect sizes (Cohen's d within 0.10) and on variance ratios (between 0.9 and 1.25). In previous investigations with matched clinical and typical development groups (Clark et al., 2002; Crocker et al., 2009; Fagerlund et al., 2012; Sukhodolsky et al., 2005), the matching criteria suggested by Kover and Steiner were not met for all of the relevant socio-demographic variables. Moreover, equivalence was based on the mean of the matched variables. A customary group-matching procedure is to exclude participants iteratively, from one or both clinical-control groups, until matching criteria are fit. In this way, however, the exclusion of participants can compromise the power of statistical procedures. Moreover, this approach prevents any data analysis procedure that takes into account the relationship between the dependent variables. To overcome these methodological concerns, the one-to-one matching procedure is preferable (e.g., Tabachnick & Fidell, 2013): each participant in the clinical group is associated with a control participant with the same or similar values of all the matching variables.

In the present study, we examined the adaptive behavior profiles of children with ADHD or SLD selected for the Italian standardization of the Vineland-II Survey Interview Form (hereafter, Vineland-II; Balboni, Belacchi, Bonichini, & Coscarelli, 2016). We compared children with ADHD or SLD and peers with typical development matched one-to-one on relevant socio-