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The Diagnostic Behavioral Assessment for autism spectrum disorder—Revised: A screening instrument for adults with intellectual disability suspected of autism spectrum disorders

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ABSTRACT

Given the strong association between intellectual disability (ID) and autism spectrum disorder (ASD), standardized instruments for the assessment of ASD in adults with ID are desirable. The *Diagnostic Behavioral Assessment for ASD – Revised* (DiBAS-R) is a DSM-5/ICD-10 based caregiver-report screening tool that consists of 19 Likert-scaled items. This study evaluated the item-validities, item-difficulties, item-variances, part-whole corrected item total-correlations, reliability, and the factorial, diagnostic, and convergent/discriminant validities of the DiBAS-R in a clinical, adult ID sample ($N = 219$). Factor analysis yielded two consistent dimensions; i.e., social interaction/communication and stereotypy/rigidity/sensory abnormalities. The diagnostic validity was adequate, as reflected by an area under the curve of 0.89 and balanced sensitivity and specificity values of 81%. The DiBAS-R total scores were significantly correlated with the *Social Communication Questionnaire* ($r = 0.52$), the *Scale for Pervasive Developmental Disorders in Mentally Retarded Persons* ($r = 0.50$), and the *Autism-Checklist* ($r = 0.59$), while no significant correlation with the *Modified Overt Aggression Scale* was observed. The interrater reliability was excellent (ICC = 0.88). These findings indicate that the DiBAS-R is a promising and psychometrically sound instrument for ASD screening of adults with ID.

1. Introduction

Individuals with intellectual disability (ID) exhibit an increased risk for autism spectrum disorder (ASD), which is associated with high rates of comorbid mental health problems and challenging behaviors (Matson & Shoemaker, 2009; McCarthy et al., 2010; Sappok, Bergmann, Kaiser, & Diefenbacher, 2010; Sappok, Budczies, Dziobek, et al., 2013). ASD is a neurodevelopmental disorder characterized by impairments in social communication and repetitive, stereotyped behaviors

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and interests (DSM-5; American Psychiatric Association, 2013). Approximately 25% of people with ID exhibit comorbid ASD (Fombonne, 2009; Kim, 2011; Sappok et al., 2010). While ASD onset occurs in early childhood, many ASD patients with comorbid ID remain undiagnosed and untreated until adulthood (Malfa, Lassi, Bertelli, Salvini, & Placidi, 2004; Sappok, Diefenbacher, Budczies, et al., 2013).

Diagnosing mental disorders or ASD in patients with ID remains challenging for a number of reasons. Firstly, individuals with ID are less able to report their inner experiences due to diminished speech comprehension and expressive abilities (Balboni, Coscarelli, Giunti, & Schalock, 2013). Secondly, due to *diagnostic overshadowing* (Reiss & Szyszko, 1983), problem behaviors or mental disorders may be attributed to the ID itself rather than an additional comorbid diagnostic entity. Thirdly, *diagnostic substitution*, i.e., diagnosing ASD rather than ID may occur (King & Bearman, 2009; Shattuck, 2006; Weintraub, 2011). Fourthly, neurological disorders, such as sensory or motor impairments and epilepsy, may further hamper diagnostic clarification (Matson & Shoemaker, 2009). Finally, currently, many adults with ID have been raised in long-term mental institutions and/or have lost contact with their relatives (Haberfellner, Grausgruber, Grausgruber-Berner, Ortmair, & Schöny, 2004); thus, their medical histories are fragmented, which produces difficulties in the proper diagnostic classification of ASD. On the background of DSM-5's emphasis on a lifetime perspective for diagnosing ASD, a thorough medical history with detailed and reliable early childhood information get even more important.

For this reason, ASD diagnostics for this group are mainly based on assessments of current behavior. Individuals with ID, especially those with comorbid ASD, may behave differently when interacting with unfamiliar people or when in an unfamiliar environment, such as a clinical setting (Gerber et al., 2011; Kumin, 1994). Therefore, it is mandatory that information from the private living environment, including information from close caregivers, be sought in the diagnostic process. Diagnostic clarification allows for more appropriate treatment options in ID and comorbid ASD that include non-drug strategies and lead to improved mental health and quality of life (Gordon et al., 2011; van Bourgondien, Reichle, & Schopler, 2003). Standardized, evidence-based instruments can support clinicians and researchers in this diagnostic process; e.g., the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1989), the Pervasive Developmental Disorder in Mental Retardation Scale (PDD-MRS; Kraijer, 2006; Kraijer & Melchers, 2003), the Social Communication Questionnaire (SCQ; Berument, Rutter, Lord, Pickles, & Bailey, 1999; Rutter, Bailey, & Lord, 2001), the Autism Spectrum Disorder-Diagnostic Scale for Adults (ASD-DA; Matson, Boisjoli, González, Smith, & Wilkins, 2007; Matson, Wilkins, Boisjoli, & Smith, 2008), and the Autism-Checklist (ACL; Sappok, Heinrich, & Diefenbacher, 2013).

The ADOS is a semi-structured observational instrument that assesses social communicative abilities (Lord et al., 1989), while the ADI-R is a semi-structured parental interview that evaluates social interaction, communication, and restrictive, repetitive behaviors and interests from childhood to adulthood (Lord, Rutter, & Le Couteur, 1994). These two instruments are frequently used in combination for diagnosing autism in children and they have recently been validated for adults with ID (Sappok, Diefenbacher, Budczies, et al., 2013). However, both measures are time-consuming and can only be applied to a limited number of adults with ID (Sappok, Diefenbacher, Budczies, et al., 2013). With increasing severity of ID and comorbidity of ASD, the feasibility of the ADOS was reduced to 68%, while the applicability of the ADI-R was even reduced to 37%, presumably due to loss of contact to close relatives. The SCQ is a screening instrument that consists of 40 binary items that are rated by parents or close caregivers (Berument et al., 1999; Rutter et al., 2001). There are lifetime and current versions of the SCQ. The SCQ-lifetime has been found to have particularly poor specificity values in cases of moderate and severe ID (Sappok, Diefenbacher, Gaul, & Bölte, in press). Raising the cut-off value of the SCQ-current improves diagnostic validity for this special group of patients, but the specificity remains rather low. The ASD-DA is another diagnostic instrument that consists of 31 items in which the rater endorses as 0 for *no impairment/not different*, or 1 for *some impairment/different*. The raters are instructed to compare the target person to an individual with a similar age living in the community. A three-factor model was computed for the scale, which showed good psychometric properties (Matson et al., 2007; Matson et al., 2008). The PDD-MRS assesses behaviors during daily routines and was conceptualized for individuals with ID between the ages of 2 to 70 years (Kraijer, 2006; Kraijer & Melchers, 2003). Although this test is considered a screening instrument, its completion takes approximately half an hour, and the test must be administered by a specialist; e.g., a psychologist or psychiatrist. The Autism-Checklist (ACL) is an ICD-10-based screening instrument for physicians. This test evaluates characteristic social interaction, communication, and stereotypies. The completion of this test requires approximately 10 min. As the sensitivity and specificity values of this test are 91 and 68%, respectively, the ACL is a suitable measure for adults with ID and suspected ASD (Sappok, Heinrich, et al., 2013). In conclusion, there is a need for an ASD screening instrument that can be easily administered by close caregivers without specific knowledge of ASD. For this purpose, we developed a 20-item questionnaire, the Diagnostic Behavioral Assessment for ASD (DiBAS) that is derived from the ICD-10 and DSM-5 criteria for ASD. In a pilot study, the DiBAS was applied to 91 patients with ID and suspected ASD (Sappok, Gaul, et al., 2014). Item validity analysis revealed 8 items that did not differentiate sufficiently between individuals with and without comorbid ASD, and despite the appropriate sensitivity of 83%, the specificity was low (64%). Thus, an item-revision of the DiBAS was recommended to further improve its diagnostic validity. The invalid items were replaced by another 8 ICD-10/DSM-5-based questions to replenish the DiBAS-Revised (DiBAS-R).

The aim of the present study was to examine the reliability and the factorial, diagnostic, and convergent/discriminate validities of the DiBAS-R in screening for ASD in adult patients with ID on the item and scale levels.