Diagnostic Interview for Social and Communication Disorders: Summary of research and key publications

Research using the DISCO includes examination of its algorithms for Asperger’s syndrome, for Wing & Gould’s Autistic Spectrum Disorder, for ICD-10 Childhood Autism (Leekam et al. 2000; Leekam, et al., 2002) and for DSM-5 (Kent, Carrington, et al., 2013). More recent studies have focused on identifying items essential for the diagnosis of DSM-5 ASD through statistical abbreviation of the DISCO DSM-5 algorithm (Carrington, Kent et al., 2014; Carrington et al., 2015). Research has also used the DISCO to investigate the role of associated sensory symptoms (Leekam et al., 2007), the adult outcomes of autism (Billstedt et al, 2007; Cederlund et al, 2008), gender dysphoria (de Vries, 2010) foetal alcohol syndrome (Mukherjee, 2011) and the link between epilepsy and autism symptoms (Danielsson et al, 2005; Turk et al, 2008). Epidemiological studies have also used the DISCO to study autism in adulthood (Brugha et al, 2011) and in the population of the Faroe Islands (Ellefsen et al, 2006). In addition, the DISCO has been used for the purpose of creating research questionnaires and checklists that have been used in studies of autism and typical populations to investigate empirical clustering of symptoms and cognitive abilities (Prior et al, 1998) the relation between language delay and diagnosis (Eisenmajer et. al, 1996) and the development of repetitive behaviours (Leekam et al. 2007; Arnott et.al, 2010).

Psychometric Data
The psychometric properties of the DISCO have been examined in studies carried out in UK in Sweden and in Holland. The UK studies (Wing et al, 2002; Leekam et al, 2002), used DISCO-9 to carry out inter-rater reliability and validity analyses with data from 82 cases aged 3 to 11 years. Thirty-six had autistic spectrum disorder, 17 had learning disability and 14 had language impairments. Inter-rater reliability was analysed for over 400 items in the interview. Inter-rater reliability was high with kappa coefficient or intra-class correlation at .75 or higher for over 80% of the interview items. Analyses with the same sample examined two algorithms based on the ninth revision of the schedule (DISCO 9). Algorithm diagnoses were applied to interview items in order to analyse the relationship between clinical and algorithm diagnoses and the inter-rater reliability between interviewers for each algorithm output. Results showed that clinical diagnosis was significantly related to the diagnostic outputs for both algorithms and inter-rater reliability was high for both algorithms. The ICD childhood disorder algorithm produced more discrepant diagnoses than the Wing and Gould autistic spectrum algorithm. Analysis of the ICD-10 algorithm items and combination of items helped to explain the reason for these discrepancies. It was concluded from these results that the DISCO is a reliable instrument for diagnosis when sources of information are used from the whole interview and that it is particularly effective for diagnosing disorders of the broader autistic spectrum.

The Swedish study (Nygren et al., 2009) used a translation of the tenth version of the DISCO (DISCO-10). Validity analysis compared DISCO-10-algorithm diagnoses with clinical diagnoses and with Autism Diagnostic Interview Revised (ADI-R) algorithm diagnoses in 57 cases of children and adults. Results showed good-excellent inter-rater reliability in 40 cases. The criterion validity was excellent when compared with clinical diagnoses and the ADI-R. The report concluded that although the DISCO-10 is not as widely used as the ADI-R, that the evidence shows that it has the same level of psychometric credibility. The authors report that similarity in psychometric quality may be traced back to the fact that the DISCO-10 was developed from the HBS, which, in turn, formed part of the basis for the design of the ADI-R. The advantage over the ADI-R however, is that the DISCO collects valuable information on the broader autism phenotype and identifies co-existing clinical conditions. A recent psychometric study has been carried out by Maljaars et al (2012) using the Dutch translation of the DISCO-11. Their study included young and low functioning children with low intellectual disability (ID). DISCO algorithms for ICD-10 were used in comparison clinical classification and with the Autism Diagnostic Observation Schedule (ADOS; Lord et. al. 1999) and Social Communication Questionnaire (SCQ: Rutter et al, 2003) to examine its criterion and convergent
validity. Sensitivity and specificity of the DISCO was .96 and .79 respectively. Strong agreement was found between DISCO-11 and ADOS classification (k=.69, p<.001) although lower agreement was found with the SCQ (k=.49, p<.001). Comparisons with clinical diagnosis showed correct classification for the majority of cases, with mismatches mainly explained by lower ID cases. These results confirm that the DISCO has good criterion and convergent validity. This was especially the case for those with average intelligence or mild intellectual disability. However, the specificity was lower for those with low levels of intellectual disability in line with previous findings.

The most recent psychometric study (Kent, Carrington et al., 2013), used DISCO data to test the DSM-5 Draft description. The study used different ways of combining the rules for a DSM-5 diagnosis. It also tested the DSM-5 criteria on children and adults with different ability levels. Using the optimal rules for diagnosis described in the study (the Modified algorithm), sensitivity and specificity of the DISCO was 1.0 and .84 respectively. The results found that DSM-5 does not significantly under-diagnose people who would currently receive a diagnosis of Autism or Asperger Syndrome. Of the 397 participants in the study, 93% of those who received a clinical diagnosis of ICD-10 (N=278) also received a diagnosis of ASD according to DSM-5. This was true for children, adolescents and adults with both high and low ability. In addition, in a sample of 200 cases of varying age and ability, the study found that 90% of the 89 individuals with a diagnosis of Gillberg’s Asperger’s syndrome (Gillberg et al., 2001), also qualified for a diagnosis of DSM-5 ASD (Kent, 2013, PhD). In a follow-up study, highly discriminating, “essential” items were identified from the DSM-5 algorithm, to try and identify a reduced set of items that could guide diagnosis. Abbreviation of the DSM-5 algorithm did not significantly affect either sensitivity or specificity within the research samples tested (Carrington, Kent et al., 2014). Moreover, a subset of items from the abbreviated DSM-5 item that best discriminated between individuals with autism and individuals with non-autism clinical diagnoses were identified. This set of just 14 items had excellent predictive validity according to best estimate clinical diagnosis, and also showed excellent agreement with established DSM-5 and ICD-10 DISCO algorithms (Carrington et al., 2015).

Research Publications


