The reliability and validity of the Greenspan Social Emotional Growth Chart (GSEGC) in Israeli children with developmental delay and autism—A pilot study

Zoma Tede [a,*], Michal Ophir Cohen [b], Arieh Riskin [c], Emanuel Tirosh [a,b]

[a] The Rappaport Faculty of Medicine, The Technion, Israel Institute of Technology, Haifa, Israel
[b] The Hanna Khoushy Child Development Center, Bnai Zion Medical Center, Haifa, Israel
[c] Department of Neonatology, Bnai Zion Medical Center, Haifa, Israel

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ABSTRACT

Healthy social-emotional development in early childhood is important as an indicator of general well-being and for positive outcome in later childhood. Therefore, screening for potential social emotional problems is valuable. Accurate, usable, and affordable screening tools have been especially difficult to develop. The cross cultural validity of a screening instrument should be assessed. The aim of the current study was to investigate the reliability and validity of the Greenspan social–emotional growth chart (GSEGC) in Israeli children of three diagnostic groups: (1) Autistic spectrum disorder (ASD) (2) Developmental language disorder (DLD) and (3) Developmental motor delay (DMD). An internal reliability of alpha of 0.95 for the GSEGC standardized for age score and of 0.78 for the sensory processing sub scores was found. A confirmatory factor analysis (CFA) using a 5-factor model confirmed an acceptable fit. Positive (62.86%) and negative (94.73%) predictive values also support the clinical usefulness of the GSEGC in identifying children at low risk for ASD. Conclusions:The GSEGC appears to be a promising tool for the screening of social emotional problems in early childhood. Further studies in different cultures are warranted.

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What this paper adds?

The results of the current investigation add new evidence for the psychometric value of the GSEGC. It is shown that the GSEGC is of particular value in identifying young children with low risk for ASD. It further provides data pertaining to the reliability and validity among children of non American origin and thus the possible applicability in diverse cultural groups.

1. Introduction

Healthy social-emotional development in children is important as an initial indicator of general well-being and it is critical for positive outcomes in schools and in other settings (Briggs et al., 2012; Heo & Squires, 2012). There is greater awareness that children with social emotional problems are at increased risk for a host of negative outcomes, including psychiatric disorders and poorer social development in later childhood (Carter, Briggs-Gowan, & Davis, 2004; Bohlin & Hageull, 2009).

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* Corresponding author.
  E-mail address: Zomat246@gmail.com (Z. Tede).

Therefore, timely and accurate identification of young children with potential social emotional problems is important (Heo & Squires, 2012; Bagner, Rodríguez, Blake, Linares, & Carter, 2012; Carter et al., 2004; Briggs et al., 2012). Via screening, a significant percentage of children can be identified as being at risk for social-emotional problems, and can be referred for further investigation (Carter et al., 2004; Squires, Bricker, Heo, & Twombly, 2001; Briggs et al., 2012). However, accurate, usable, and affordable screening procedures to assist in the detection of social or emotional problems in young children have been particularly slow to emerge (Bagner et al., 2012) and difficult to develop (Briggs-Gowan & Carter, 2008; Carter et al., 2004).

In children with ASD impairments in social interaction and difficulties in emotional competence are considered core deficits and these difficulties span over all developmental stages, regardless of cognitive abilities (Sappok et al., 2013; Bauminger, 2002). The social abilities of toddlers with ASD were found to be more impaired than children with other developmental deficits such as global developmental delay and specific language disorders (Ventola et al., 2007). The prevalence of social difficulties among the latter although, of milder severity (Bacon, Fein, Morris, Waterhouse, & Allen, 1998) has been repeatedly documented (Brinton & Fujiki, 2005; Mok, Pickles, Durkin, & Conti-Ramsden, 2014). According to the Centers for Disease Control and Prevention (CDC), 1 in 68 American children was diagnosed in 2010 with ASD which is a 30% increase from 2008 (Hampton & Strand, 2015). This increase may reflect improved detection and recognition of autism and its variants, it could be attributed to changes in the diagnostic practice, or it may reflect an actual increase in the prevalence of autism (Al-Qabandi, Gorter, & Rosenbaum, 2011).

The American Academy of Pediatrics (AAP) recommended that screening for autism be incorporated into routine practice (Plauche Johnson & Myers, 2007).

Different screening instruments are available in Europe (García-Primo et al., 2014) and in the USA (Hampton & Strand, 2015).

The Checklist for Autism in Toddlers (CHAT; Baron-Cohen, Allen, & Gillberg, 1992) was developed for primary screening of 18 month-olds in the United Kingdom. The CHAT includes 14 items related to joint attention and pretend play, 9 of which are reported by the parents and 5 of which are directly observed. CHAT has a high specificity of 98%, but a low sensitivity. The results depend on whether a 1- or 2-stage screening protocol is followed. When administered to a population of 16235 children at 18 months, the CHAT failed to detect children with mild symptoms and those with a regressive pattern of autism. In addition, the CHAT did not discriminate well between children with global developmental delay and ASD. Sensitivity increased when the CHAT was administered at 24 months (Al-Qabandi et al., 2011). Overall, due to the need to observe 5 behaviors and the low sensitivity the CHAT is not recommended for early detection of autism (Al-Qabandi et al., 2011; Baird et al., 2000).

The Modified CHAT (M-CHAT; Robins, Fein, Barton, & Green, 2001) was developed as a primary screening instrument for autism at health supervision visits for children between 16 and 30 months of age. It is a 23-item yes/no parent questionnaire that takes 5 min to administer with a specificity of 99% and a sensitivity of 85% (Al-Qabandi et al., 2011; Robins & Dumont-Mathieu, 2006). Overall, the M-CHAT was found to be a promising instrument for the early detection of ASD in children 16–30 month olds. The biggest shortcoming of the M-CHAT appearing to date is the low PPV of the screener in unselected populations before the telephone interview. Therefore, for low-risk samples it is important to always use the follow-up interview either in person or on the telephone (Kleinman et al., 2008).

The Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003) was developed from the Autism Diagnostic Interview-Revised (ADI-R) and is often considered the gold-standard diagnostic interview used in autism research studies. The SCQ is a parent-report screening inventory that comprises 40 yes/no questions and consists of four subscales: social interaction, communication, abnormal language, and stereotyped behaviors. The SCQ can usually be completed in less than 10 min and takes less than 5 min to score (Al-Qabandi et al., 2011). Most previous studies that investigated the diagnostic validity of the SCQ identified sensitivity and specificity scores within the "acceptable" range (Hampton & Strand, 2015).

The Gilliam Autism Rating Scale (GARS; Gilliam, 2006) is an instrument designed to screen for ASDs among individuals 3–22 years of age. It is a behavioral checklist developed for use by parents, teachers, and professionals to discriminate individuals who are autistic from those with other developmental disabilities. The GARS intended to be used in both clinical and research settings (Hampton & Strand, 2015; South et al., 2002). It consists of 42 items on which a caregiver rate behaviors on a four-point Likert scale, ranging from "never observed" to "frequently observed". Items are grouped into three subscales: communication, social interaction, and stereotyped behaviors. A primary summary score, called the autism index, is used to predict diagnostic group placement, with cutoff scores of 69 or less indicating a child is "unlikely" to have autism, 70–84 identifying a child "possibly" has autism, or 85 and higher signifying a child is "likely" to have autism (Hampton & Strand, 2015). Most studies that investigated the diagnostic validity of the GARS found it to be lacking (Hampton & Strand, 2015).

There are many other ASD screening instruments available for use by the primary caregiver or the developmental screener. However, none of the autism screening instruments currently available has been shown to be able to fulfill the properties of accuracy namely high sensitivity, high specificity, and high predictive value in a population-wide screening program (Al-Qabandi et al., 2011). Sensitivity and specificity are often considered the most important criteria of validity (García-Primo et al., 2014; Hampton & Strand, 2015) and a trade-off between these two parameters is common in a way that a screening procedure with a high sensitivity will often have a high false-positive rate, thereby lowering its specificity (García-Primo et al., 2014). In addition, the sensitivity and the specificity of the autism screening tools vary depending on the age of the child and the severity of symptoms (Al-Qabandi et al., 2011).