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Developing a short form of the Psychoeducational Profile-Third Edition for children with autism spectrum disorder



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ABSTRACT

The Psychoeducational Profile-Third Edition (PEP-3), a standardized and norm-referenced scale, is designed to assess the development of communication and motor skills and the presence of maladaptive behaviors in children with autism spectrum disorder (ASD). The purpose of this study was to develop a short form of the PEP-3, the SF-PEP3, which would reduce the administration time while maintaining the psychometric properties similar to the original version. The study consisted of two parts: development and cross-validation of the SF-PEP3. In the first part, 116 children with ASD were recruited and assessed with the Chinese Psychoeducational Profile-Third Edition (CPEP-3). After 6 months, 63 of them were assessed again. We developed the SF-PEP3 by selecting the items with the highest internal consistency and the greatest responsiveness. The easiest and the most difficult items were added because of the notable ceiling and floor effects. The psychometric properties of the 4 versions of the SF-PEP3 were compared with the original CPEP-3. The score distribution, the reliability, and the concurrent validity of the 73-item SF-PEP3 were better than those of the 57-item and 66-item SF-PEP3s. The responsiveness of the 73-item SF-PEP3 was better than those of the 79-item SF-PEP3 and the original CPEP-3. Thus, the 73-item SF-PEP3 was determined to be the best. In the second part, 101 children with ASD were recruited, and 35 of them were followed up after 1 year. The psychometric properties of the 73-item SF-PEP3 were cross-validated and found to be similar to those of the original CPEP-3. In conclusion, the 73-item SF-PEP3 has been developed and shown to be psychometrically similar to the original CPEP-3. It is recommended that the 172-item CPEP-3 be used in the initial evaluation and that the subtests or composites scores of the 73-item SF-PEP3 be used as the outcome indicators for children with ASD.

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1. Introduction

Autism spectrum disorder (ASD) represents persistent deficits in social communication and social interaction across multiple contexts, as well as restricted, repetitive patterns of behaviors, interests, or activities (American Psychiatric Association, 2014). Assessment of communication, motor skills and maladaptive behaviors is crucial in determining the severity of symptoms, setting appropriate treatment goals and plans, and monitoring the treatment progress of children with ASD (Schopler, Lansing, Reichler, & Marcus, 2005; Tomchek & Case-Smith, 2009).

The Psychoeducational Profile-Third Edition (PEP-3), a standardized and norm-referenced scale, is designed to assess the development of communication and motor skills and the presence of maladaptive behaviors in children with ASD (Schopler et al., 2005). The PEP-3 is the most useful measure for assessing the lower functioning end of children with ASD because it contains nonverbal, untimed, and easy items, concrete testing materials, and flexible testing processes (Fu et al., 2010; Fulton & D'Entremont, 2013; Schopler et al., 2005). The PEP-3 can also help clinicians realize children's competence and performance, and get more objective information because it uses two kinds of administration, direct observation of the child, and caregiver reports (Fu, Chen, Tseng, Chiang, & Hsieh, 2012). Moreover, the PEP-3 can be used to assist clinicians or educators in planning treatment or educational programs (Schopler et al., 2005), and it is also the most valid outcome measure which measures the global functioning in children with ASD (McConachie et al., 2015).

However, two issues hinder the widespread utility of the PEP-3. First, the PEP-3 has 172 items and requires 45–90 min to administer (Schopler et al., 2005). This lengthy administration time may cause children with ASD to feel bombarded and is not appropriate for use in busy clinical settings. Second, the high internal consistency of the PEP-3 subtests (Cronbach's $\alpha = 0.92\text{--}0.98$ (Fu et al., 2010)) indicates item redundancy (Frisbie, 1988). To address these issues, the purpose of this study was to develop a short form of the PEP-3, the SF-PEP3, to monitor children's progress and developmental status. We hypothesized that the use of the SF-PEP3 can reduce the administration time while maintaining the psychometric properties similar to those of the original version of the PEP-3.

2. Methods

2.1. Participants

Two cohorts of children with ASD participated in our study. The first cohort, the calibration and validation group, was recruited from the departments of physical medicine and rehabilitation of 2 medical centers in Taipei, Taiwan. The second cohort, the cross-validation group, was recruited from 2 developmental centers, 1 pediatric rehabilitation clinic, and 5 child psychiatry and rehabilitation departments of general hospitals in Taiwan. The both cohorts were convenient sample. Their mean subtest scores of the PEP-3 higher than the midpoints of the scales represented that they might be the higher functioning end of the spectrum.

All the participants met the following four criteria. First, they were diagnosed as autistic disorder, Asperger's disorder, or PDD-NOS by child psychiatrists according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders-Fourth edition, Text Revision (DSM-IV-TR, American Psychiatric Association, 2000) or the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10, World Health Organization, 2007) through observation of the child, interviewing their parents, and multi-disciplinary assessments. They also had the Catastrophic Illness Card with the diagnosis of ASD issued by the Bureau of National Health Insurance, Department of Health, Taiwan. Second, they were aged from 2 years to 7.5 years. Third, their parents or primary caregivers gave informed consent. Fourth, they did not have other physical disorders, blindness, or deafness.

2.2. Measure

The PEP-3 is specifically designed for children with ASD aged from 2 years to 7.5 years (Schopler et al., 2005). The PEP-3 consists of 172 items, which are combined to form 10 subtests (cognitive verbal/preverbal (CVP), expressive language (EL), receptive language (RL), fine motor (FM), gross motor (GM), visual-motor imitation (VMI), affective expression (AE), social reciprocity (SR), characteristic motor behaviors (CMB), and characteristic verbal behaviors (CVB)) and 3 composites (communication, motor, and maladaptive behaviors) (Schopler et al., 2005). A higher score indicates better performance or fewer maladaptive behaviors (Schopler et al., 2005). The internal consistency of the subtests and composites is above 0.90 and the 2-week interval test-retest reliability is 0.94 (Schopler et al., 2005). With respect to its concurrent validity, scores of the PEP-3 subtests are significantly correlated with scores of the Vineland Adaptive Behavior Scale (Fulton & D'Entremont, 2013; Schopler et al., 2005), the Childhood Autism Rating Scale (Schopler et al., 2005), the Autism Behavior Checklist-Second Edition (Schopler et al., 2005), the Brief Ability Rating Scale (Schopler et al., 2005), the Child Development Inventory (Fulton & D'Entremont, 2013) and the Merrill-Palmer Revised (Fulton & D'Entremont, 2013). The PEP-3 CVP score was negatively correlated with the scores of the Autism Diagnostic Observation Schedule (Fulton & D'Entremont, 2013). Confirmatory factor analysis has confirmed that the PEP-3 contains three factors: communication, motor, and maladaptive behaviors (Schopler et al., 2005). The EL and RL subtests in PEP-3 and all the subtests in the previous version (PEP-Revised, PEP-R) are responsive in researches examining the intervention effects of early intervention programs, home-based intervention programs, animal-assisted therapy or Treatment and Education of Autistic and Communication Handicapped Children (Braidon,

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