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The preliminary analysis of the reliability and validity of the *Chinese Edition of the CSBS DP*

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ABSTRACT

This study marked a preliminary attempt to standardize the *Chinese Edition of the Communication and Symbolic Behavior Scales Developmental Profile* (Wetherby & Prizant, 2002; *CSBS DP*) to assist in the early identification of young children with special needs in Taiwan. The study was conducted among 171 infants and toddlers aged 1–2. It also included a follow-up study one year after the initial test. Three domestically developed standardized child development inventories were used to measure the concurrent validity and predictive validity. The *Chinese Edition of the CSBS DP* demonstrated overall good test–retest and inter-rater reliability. It also showed good concurrent and predictive validity. The current study yields preliminary evidence that the *Chinese Edition of the CSBS DP* could be a valuable assessment tool worthy of wider distribution. Future research should employ random sampling to establish a true national norm. Additionally, the follow-up study needs to include atypical groups and to expand to children aged 6–12 months to strengthen the applicability of the instrument in Taiwan.

1. Introduction

Early identification plays a critical role in early intervention. There is a substantial body of research indicating that individual differences in prelinguistic communication are predictors of later language development (Chiat & Roy, 2008; Watt, Wetherby, & Shumway, 2006). The most dramatic changes in language abilities that occur from 1–2 years are reflected in the transition from prelinguistic to linguistic communication. Emergent skills across this period that have been linked to later receptive and expressive language outcomes include the use of gestures (Rowe & Goldin-Meadow, 2009), communication for joint attention (Watt et al., 2006), early vocal behaviors such as inventory of consonants (Watt et al., 2006), rate of vocalization (McCathren, Yoder, & Warren, 1999), frequency of communicative requests (Calandrella & Wilcox, 2000) and symbolic and functional play (Lewis, Boucher, Lupton, & Warren, 2000).

Paul and Roth (2011) reviewed the literature on predicting language outcomes in five infant/toddlers populations who were eligible for early intervention services. In young preverbal children with developmental disabilities, the communicative means, social-affective signaling, reciprocity, and communication functions were found to be the

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significant predictors of later expressive language (McCathren, Yoder, & Warren, 2000). Yoshinaga-Itano (2003) reviewed of longitudinal studies on the early predictors of successful outcomes in Colorado Home Intervention (CHIP) program with infants and toddlers who are deaf and those who are hard of hearing. These results showed that language development was significantly and positively affected by age of identification of hearing loss and age at initiation of intervention services.

McDuffie, Yoder, and Stone (2005) identified a predictive model of vocabulary comprehension and production in a group of toddlers who have been diagnosed with autism spectrum disorder (ASD). The results showed that both preverbal commenting and motor imitation without objects were the unique predictors of vocabulary production 6 months later. Yoder (2006) also reported that the initial frequency of intentional communication and diversity of object play were predictors of lexical density growth over an early 12 months in toddlers with ASD. Other findings from the predicting outcomes of late talkers have revealed that although most late talkers were not identified as having language disorders by school age, they continued to score significantly lower than typically developing children with the similar socioeconomic status on most language measures such as reading through age 9 (Rescorla, 2002).

These findings on the prelinguistic predictors of later language development either in typical or atypical population suggest that children who start out at relatively higher end of the curve tend to have better prognoses, and those who start out at the low end of the curve tend to remain there. Instead of waiting for children to start using words, there is a critical need of a valid and reliable instrument to evaluate these prelinguistic predictors for early identification in children with communication problems. As is often observed in clinical settings in Taiwan, most infants and toddlers who are brought to the hospital by parents out of concern over their speech are older than two and did not exhibit signs of developmental disabilities at birth. However, parents' limited understanding of these subtle but important differences often delays the early identification of young children with special needs.

Currently in Taiwan, there are only a small number of assessment instruments that target infants and toddlers aged two or younger. To assess nonverbal communication for these young children, the *MacArthur-Bates Communicative Development Inventory-Taiwan Version (MCDI-T)* (Liu & Cao, 2010) is the only instrument available that was revised based on the original *MCDI* (Fenson et al., 1993). There are other instruments designed for children up to age 6. However, most these instruments rely solely on interviews of or surveys filled out by parents. Examples have ranged from instruments that were revised and standardized in Taiwan based on tools developed abroad such as the *Developmental Test of Infants and Toddlers* (Xu, Liao & Xu, 1973), based on the work by Frankenburg and Dodds in 1967, and the *Chinese Child Development Inventory (CCDI)*, based on the *Minnesota Child Development Inventory* (Ireton & Thwing, 1972), to those developed domestically, such as the *Developmental Screening Scale for Children Aged 0–6* (Huang, 2000) and the *Preschool Child Development Checklist* (Zheng, Zou, & Lu, 1998).

Introduced in the US in 1993, the *CSBS DP* has demonstrated good reliability and validity (McCathren et al., 2000; Wetherby, Allen, Cleary, Kublin, & Goldstein, 2002; Watt et al., 2006) and has been adopted in countries such as Australia (Eadie et al., 2010) and Croatia (Cepanec, Lice, & Simlesa, 2012). Wetherby et al. (2002) conducted a study among three hundred and nineteen infants and toddlers aged 12–24 months, using the *CSBS DP* first and following up with the *PLS-3* (*Preschool Language Scales-3*, Zimmerman, Steiner & Pond, 1992) or the *MSEL (Mullen Scales of Early Learning*, Mullen, 1995) two years later. They grouped the study subjects into three categories: 12–16 months, 17–21 months, and 22–24 months. The study found that the initial *CSBS DP* test score could confidently predict the level of language development two years later across all three age groups, with the highest sensitivity (predicting 53% of the variance) observed in the 17–21 month age group. The test–retest reliability of the *CSBS DP* was also examined in this study. The researchers concluded that with its demonstrated reliability and validity, the *CSBS DP* appeared to be an effective instrument for identifying young children with special needs between the ages of 6 and 24 months. Watt et al. (2006) conducted a study among one hundred and sixty infants and toddlers aged 14 months on average. It included two follow-up studies that were conducted when the study subjects turned 20 months, and 3 years old to assess their receptive and expressive language development using the *MSEL*. The study found that the symbolic behavior score on the *CSBS DP* at the age of 14 months could predict the *MSEL* score for receptive language development when the subjects turned 3 years old.

Parent report is one strategy used in assessment instruments for both screening and to support diagnosis of communication delay. Parent report assessments are generally cost-effective, requiring no child cooperation and could be expected to provide a more representative and comprehensive assessment of a child's abilities over time than those made by a professional on the basis of a short observation. In contrast, direct behavioral observations have the advantages that the infants' and toddlers' communication behaviors are observed or evaluated by professionals trained in communication development within the time period. Sachse and Von Suchodoletz (2008) compared the accuracy and diagnostic power of a parent report and direct language assessment for early identification of children with language delay in Germany. The results showed that there were no marked differences between two instruments regarding accuracy of prediction of language delay in 2-year-old toddlers.

Assessment instruments currently available for birth to 2 years old rely heavily on parent report, with only a few structured observational procedures currently available. The *CSBS DP* is one of the few available for this age group which has both an observation and a parent report component for early detection of ASD, developmental delays and language impairments. Before embarking on the series of the study, the research team obtained permission from the original author and the publisher to translate the *CSBS DP* into Chinese. Translations of the development checklists for the infants and toddlers and the questionnaires for the parent interviews, in addition to modifications such as substituting English picture books with Chinese ones, were all carried out in collaboration with the original author. This study marked a preliminary