

Original article

# Development and verification of child observation sheet for 5-year-old children

Keiko Fujimoto<sup>a,\*</sup>, Toshisaburo Nagai<sup>a</sup>, Shin Okazaki<sup>b</sup>, Mie Kawajiri<sup>c</sup>,  
Kiyotaka Tomiwa<sup>d</sup>

<sup>a</sup> Course of Health Science, Graduate School of Medicine, Osaka University, Osaka, Japan

<sup>b</sup> Osaka City General Hospital, Osaka, Japan

<sup>c</sup> Osaka City Health Center, Osaka, Japan

<sup>d</sup> Todaiji Medical and Educational Center, Nara, Japan

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## Abstract

The aim of the study was to develop a newly devised child observation sheet (COS-5) as a scoring sheet, based on the Childhood Autism Rating Scale (CARS), for use in the developmental evaluation of 5-year-old children, especially focusing on children with autistic features, and to verify its validity. Seventy-six children were studied. The children were recruited among participants of the Japan Children's Cohort Study, a research program implemented by the Research Institute of Science and Technology for Society (RISTEX) from 2004 to 2009. The developmental evaluation procedure was performed by doctors, clinical psychologists, and public health nurses. The COS-5 was also partly based on the Kyoto Scale of Psychological Development 2001 (Kyoto Scale 2001). Further, the Developmental Disorders Screening Questionnaire for 5-Years-Olds, PDD-Autism Society Japan Rating Scale (PARS), doctor interview questions and neurological examination for 5-year-old children, and the Draw-a-Man Test (DAM) were used as evaluation scales. Eighteen (25.4%) children were rated as Suspected, including Suspected PDD, Suspected ADHD and Suspected MR. The COS-5 was suggested to be valid with favorable reliability ( $\alpha = 0.89$ ) and correlation with other evaluation scales. The COS-5 may be useful, with the following advantages: it can be performed within a shorter time frame; it facilitates the maintenance of observation quality; it facilitates sharing information with other professions; and it is reliable to identify the autistic features of 5-year-old children. In order to verify its wider applications including the screening of infants (18 months to 3 years old) by adjusting the items of younger age, additional study is needed.

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**Keywords:** COS; Pervasive developmental disorders; Clinical psychologists; 5-Year-old children; Screening; CARS

## 1. Introduction

In recent years, studies of pervasive developmental disorders (PDDs) have been increasingly conducted, and a large number of researchers have reported that

early detection and intervention are essential for the treatment of PDDs [1–5]. Particularly in children with high-functioning ( $IQ \geq 70$ ) pervasive developmental disorders (HFPDDs) without marked verbal retardation, it has been shown to be difficult to provide early diagnosis and support [5,6].

Some preceding studies have reported that it is possible to provide a reliable diagnosis of autism spectrum disorders (ASDs) at the age of 2 [1–3]. In Japan, although

\* Corresponding author. Address: Course of Health Science, Graduate School of Medicine, Osaka University, 1-7 Yamadaoka, Suita, Osaka 567-0871, Japan. Tel./fax: +81 6 6879 2531.

E-mail address: k5\_fujimoto@yahoo.co.jp (K. Fujimoto).

development screening systems for 3-month-, 18-month-, and 3-year-old infants have been established, PDDs are not sufficiently screened by those screening systems at the present time [6].

Children with developmental problems are usually identified through 18-month- and 3-year-old child screening performed by public health nurses and clinical psychologists, but some are not conclusively diagnosed until they enter an elementary school. In line with this, 5-year-old preschool child screening has been a focus and has been performed in Japan in recent years, revealing its growing importance [7,8]. Screening systems, however, vary among municipalities, and evaluation methods, excluding doctors' observations, have not yet been fully examined [9,10]. Under such circumstances, it may be necessary to develop a well-structured observation method applicable to Japanese screening systems in order to precisely understand the characteristics of children with PDDs.

Previously, several PDD screening systems have been developed. The most accurate instrument is the Autism Diagnostic Interview Revised (ADI-R) [11], a semi-structured diagnostic interview which has not been easily adopted in Japan, as it is designed to be exclusively used by researchers engaged in developer-certified research, after being trained in the USA, and takes several hours to perform and score.

It has also been reported that, on screening using the CARS-Tokyo Version (CARS-TV), a Japanese version of the Childhood Autism Rating Scale (CARS) [12], those with HFPDDs exhibited significantly higher scores than those with attention deficit hyperactivity disorder (ADHD) [13], suggesting the possibility of using this instrument for developmental screening.

Based on these ideas, this study aimed to develop a child observation sheet for 5-year-old children (COS-5) based on the CARS [14] and CARS-TV, and to verify its validity by comparing it with the results of the comprehensive assessment, which included doctor's examination, psychologist observation, and questionnaire provided by parents.

## 2. Subjects and methods

### 2.1. Subjects and period of study

The subjects were recruited from participants in District-A of the Japan Children's Study (JCS) [15], implemented by the Research Institute of Science and Technology for Society (RISTEX) from 2004 to 2009. Among 129 participants aged 5, 76 (58.9%) were studied whose parental consent was obtained.

This cohort studies based on Brain-Science, aim to elucidate the development of sociability. The Osaka research group (JCSO) conducts a longitudinal study of children, up to 36 months. The number of births in District-A was 834 in 2005. The initial number of participants in the JCSO study was 280.

The period of the present study was from April 2010 to March 2011.

### 2.2. Methods

The developmental evaluation procedure was performed at the Health and Welfare Center of District-A. Fig. 1 shows on developmental evaluation, the results of consultations with doctors, clinical psychologists' observations, and interviews with parents were comprehensively evaluated and collated with the results of a questionnaire provided to parents before developmental evaluation. Feedback regarding the child was provided to his/her parents within the same day.

The determination meeting was participated in by four doctors and two psychologists who had been involved in developmental evaluation. Determinations were conducted according to the DSM-IV diagnosis by referring to data obtained from each scale. Diagnostic results were classified into "Normal", "Observation", and "Follow-up".

Diagnostic criteria were as follows: Children undergoing typical development were diagnosed as "Normal". When doctors' diagnosis or psychologists' observation had identified unusual behaviors, but not the level of the disorders defined in the DSM-IV, in children, they were included in the "Observation" group. Children who required follow-ups but not diagnosis were classified into the "Anxious" group. Children who presented with the characteristics of the disorders defined in the DSM-IV and had been at high risk were classified into the "Suspected" group. Suspected and Anxious groups were included in the "Follow-up" group. Regarding PDD and ADHD, diagnoses were conducted in accordance with the DSM-IV. Diagnosis of MR was performed using mainly the DAM, and based on the IQ scores for drawing skills.

### 2.3. Ethical considerations

The study was conducted with approval of the research ethics committee of the related organization.

A letter of request for participation in the study and an attitude questionnaire were provided to participants of the JCSO study. The questionnaire responses were individually returned to researchers by mail. Subsequently, written consent was obtained from those who wished to participate in our developmental evaluation for 5-year-olds. On the day of developmental evaluation, parents' approval was confirmed again prior to developmental evaluation and analysis.

### 2.4. Evaluation scales

For a structured observation approach, a child observation sheet was initially developed, adopting mainly the

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