THE COMMUNICATION DEALL DEVELOPMENTAL CHECKLIST - INTER RATER RELIABILITY

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ABSTRACT

A checklist is ideal when assessing young children who are 'difficult to test'. The Communication DEALL Developmental Checklist (CDDC) was developed by Karanth (1), to assess developmental skills of children up to the age of 6 years, along eight developmental domains, with norms based on an Indian population. Since all checklists depend on rater reliability, the aim of the current study was to establish inter rater reliability of the CDDC. Two senior Speech Language Pathologists used a 4-point rating scale, to assess 40 children with developmental disabilities (across the ages of 0-6 years) on the CDDC checklist. Each rater independently made two ratings during the assessment; the first as reported by the parent (PR1 and PR2), and the second based on the clinician's own observation (CR1 and CR2). The correlation between CR1 and CR2, as well as PR1 and PR2 for each rater separately, was found to be high, suggesting that the CDDC provides a reliable baseline for the developmental skills of children up to 6 years.

Key words: Assessment of developmental skills, children with developmental disabilties, India

INTRODUCTION

The Communication DEALL programme is an early intervention programme. It provides intensive multidisciplinary intervention to small groups of 12 children, in the age range of 0-6 years, diagnosed with developmental disabilities. The goal of the programme is to integrate these children into regular schools by school entry age, i.e., 6 years. Assessment of the child's skills prior to, and periodically during the intervention, is important for measuring progress and to ascertain whether the child is ready for schooling.

The assessment of young children is a difficult and time-consuming process. When very young children - from a few months old, and upto six years of age - have developmental difficulties, the problem of assessment is further compounded. For the 'difficult to test' population, which includes children with developmental

disabilities, assessment is generally carried out through checklists that measure a range of skills, based on reports given by caregivers. Checklists have generally been designed by clinicians, who target very specific areas like motor or mental capabilities, or speech and language skills. To assess the actual skills, the checklist has to be a reliable tool which has been tried and tested.

The Communication DEALL Developmental Checklist (CDDC) was developed by Karanth (1), to carry out assessments of the children enrolled into the Communication DEALL programme. The CDDC is a criterion referenced checklist, to assess developmental skills in 8 domains – namely, gross and fine motor skills and activities of daily living, receptive and expressive language skills, and cognitive, social and emotional skills - at 6 month intervals, from 0 – 6 years of age. The questions in each of the 8 domains have been divided into 12 subgroups, i.e., 0-6 months, 6-12 months, etc. For each subgroup, three questions have been delineated to assess skills within that age range. The total number of questions per domain is 36, and the total number of questions within the checklist, across all 8 domains, is 288. The checklist carries with it a response sheet, which has appropriate space to mark the child's responses to the questions. The norms for the CDDC were based on field testing of 360 Indian children. However, at that time the inter rater reliability was not established.

An inter rater reliability study is essential, to check the degree of agreement among raters while using a checklist like the CDDC. Sound reliability portrays a good consensus between the raters during assessment. When rating scales are used to rate responses, subjectivity influences the outcome to a great extent. To ensure that a checklist is thorough and has been developed with utmost clarity, an inter rater reliability test becomes necessary. Hence this study was conducted, to test the inter rater reliability for the Communication DEALL Developmental Checklist (CDDC).

METHOD

Two raters (R1 and R2) conducted the assessments in the study. The raters were senior Speech Language Pathologists working with Com-DEALL. They had experience with assessment on the CDDC, prior to the study.

The assessment was conducted at the Com-DEALL head office, in small cubicles or an open play area (the area was chosen depending on the comfort level of the child to be assessed). At the time of assessment, both raters were present along with the child and his/her parent/s (P). Appropriate materials for assessment

were chosen, and distractions were kept to the minimum. The assessment was carried out for a duration of 45 minutes to one hour per child.

Tool used

Raters conducted the assessment, using the Communication DEALL Development Checklist (CDDC).

Subjects

The subjects chosen were children under the age of 72 months. These were children with developmental disabilities, who came to Com-DEALL Trust to seek appropriate assessment and intervention. The total number of subjects was 40.

Procedure/ Administration

Each rater had a copy of the checklist and a fresh score sheet for each child to be assessed. One of the raters (either R1 or R2) asked the parents (P) the questions on the checklist across all domains, one after the other. The questions were put forth as given in the checklist. Additional examples were given where relevant, for the family to comprehend the questions better.

Each of the raters noted two ratings: (1) ratings of the parent's responses to the questions (PR), and (2) ratings of their own observations of the child's skills (CR). Hence, rating by R1 are PR1 (Parent rating as marked by R1) and CR1 (R1's rating based on observation of the child's skills). In a similar manner, R2's ratings are PR2 and CR2.

Testing in each domain was terminated at the chronological age of the child.

Scoring

The rating of the responses was done along a 4 point scale:

0 - Not acquired
1 - Acquired but lost
2 - Acquired but present inconsistently
3 - Acquired and consistently present across all situations
NR - No response

Inter rater Analysis

For all the 40 subjects, the two raters scored the following: Parental reports as marked by the two raters (PR1 and PR2), and ratings of their own observations by raters (CR1 and CR2).

Statistical Analysis

MS. Excel

MS Excel software (version 2003) was used for the calculation of 'Individual total score' for each child, as given by each rater separately. For this, the sum of the ratings of PR (PR1 for R1 and PR2 for R2) and CR (CR1 for R1 and CR2 for R2) within a domain was calculated. The calculations were done separately for every domain.

This was followed by calculating the 'Overall total scores' by each rater. The calculation was done by summing up the 'Individual total scores' (as calculated earlier) for all 40 children, separately under each domain. Again, the sum of all PR1 or PR2, and CR1 or CR2 was used, separately for each rater (R1 or R2).

Statistical Test used

The SPSS (version 11.5) statistical software was used for statistical analysis of the data. For analysis of correlation, Pearson's r was used to measure correlation between the raters (R1 and R2), between the parents (PR1 and PR2), and between rater's and parent's ratings.

RESULTS AND DISCUSSION

Tables 1, 2 and 3 show the results of the statistical analysis through Pearson's coefficient of correlation for all 40 children.

Table 1. Table of correlation values (CR) between the raters (R1 and R2)

SL. NO	INTER RATER ANALYSIS	PEARSON'S CORRELATION
1	MOTOR	
A	*Gross motor*	0.948*
B	*Fine motor*	0.891*
C	*ADL*	0.977*
2	COMMUNICATION	
A	*Receptive language*	0.974*
B	*Expressive language*	0.964*
3	HIGHER COGNITIVE SKILLS	
A	*Cognitive*	0.951*
B	*Social*	0.956*
C	*Emotional*	0.964*

* Statistically significant

Table 2. Table of correlation values (PR) between the parent's ratings (PR1 and PR2)

SL.NO	INTER RATER ANALYSIS	PEARSON'S CORRELATION
1	MOTOR	
A	Gross motor	0.948*
B	Fine motor	0.891*
C	ADL	0.977*
2	COMMUNICATION	
A	Receptive language	0.977*
B	Expressive language	0.965*
3	HIGHER COGNITIVE SKILLS	
A	Cognitive	0.955*
B	Social	0.941*
C	Emotional	0.927*

* Statistically significant

Table 3. Table of correlation values between CR and PR

	Average scorings		
Domains	**CR (CR1 & CR2)**	**PR (PR1 & PR2)**	**Correlation Value**
GM	2081.0	2081.0	0.999*
FM	1938.5	1943.5	
ADL	1853.0	1853.0	
RL	1422.0	1457.5	
EL	1303.0	1311.5	
COG	1783.0	1804.0	
SOC	1409.0	1413.0	
EM	1580.0	1579.5	

* Statistically significant

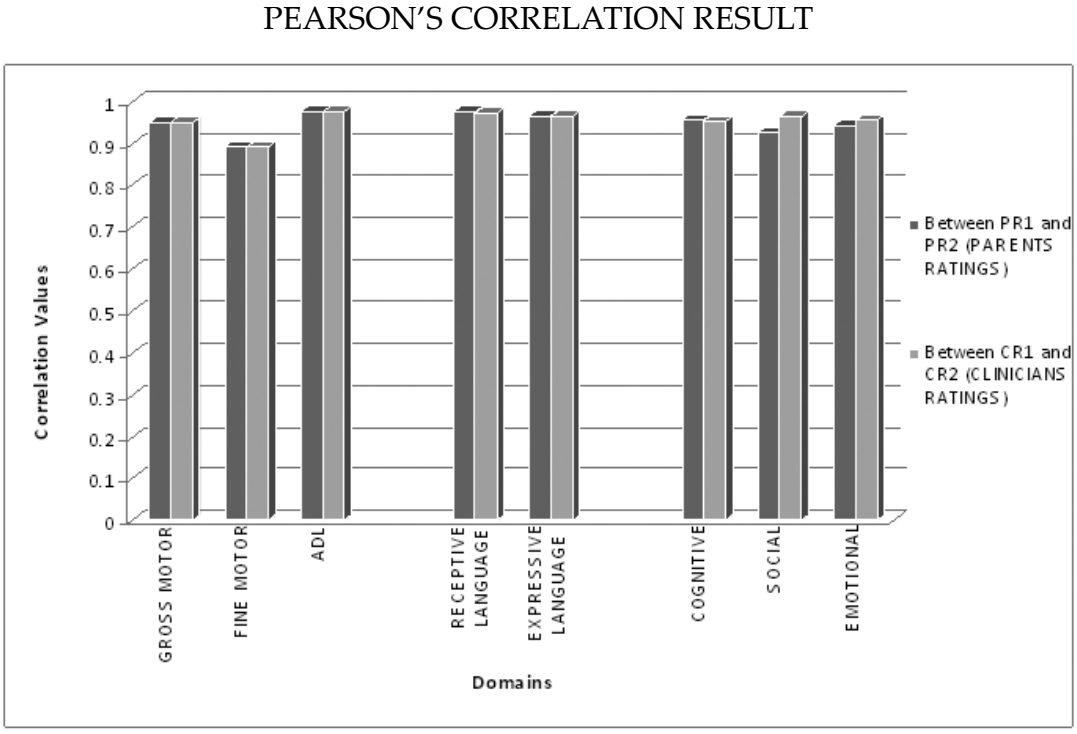
Overall scores

The correlation between CR1 and CR2, between PR1 and PR2 and between the average of CR (1 and 2) and the average of PR (1 and 2) over all the domains, is greater than 0.89.

The correlation values between CR1 and CR2, between PR1 and PR2 and between CR (1 and 2) and PR (1 and 2) in the Motor domains (Gross motor, Fine motor, and Activities of Daily Living skills); Communication domains (Receptive and Expressive language) and Higher Cognitive domains (Cognitive, Social and Emotional skills), are greater than 0.89. The correlation value between overall CR average and overall PR average is 0.99.

The values indicate a high correlation between CR1 and CR2, between PR1 and PR2 and between the average of CR (1 and 2) and the average of PR (1 and 2) over all domains, and are significant in nature.

Figure 1. Graph showing the correlation analysis values between PR1 & PR2 and between CR 1 & CR2 for both raters and between PR (1&2) and CR (1&2) over all domains



Motor, Communication and Higher Cognitive Skills

Within each domain the correlation of coefficient is also found to be high. Within the Motor skills domain, the correlation of coefficient is between 0.89 and 0.97,

whereas the correlation coefficient within the Communication and Higher Cognitive skills domain is between 0.96 and 0.97, and 0.92 and 0.96, respectively.

Hence, a high correlation is seen not only over all the domains, but also within it.

CONCLUSION

The results represented in the study show correlation values for all the domains as being greater than 0.89. This indicates that the correlation values of the ratings - between CR1 and CR2, between PR1 and PR2 and between the average of CR (1 and 2) and average of PR (1 and 2) - are high, and also statistically significant as per the correlation measures used.

Such high correlation values indicate agreement between the ratings by raters (CR1 and CR2) and ratings of the parents' responses (PR1 and PR2), and between raters' and parents' responses (CR (1 and 2) and PR (1 and 2). This suggests high reliability.

One should note that the parents of children taken for the study were highly literate. This might be a contributory factor to the high correlation between the PR and CR. Caution is advised if the checklist is administered by inexperienced clinicians, or parents whose literacy levels are not high.

A limitation of the study was the small sample size of 40 children.

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