

Comparison of the Reliability of Parental Reporting and the Direct Test of the Thai Speech and Language Test

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Objective: To find reliability of parental or caregiver's report and testing of the Thai Speech and Language Test for Children Aged 0-4 Years Old.

Material and Method: Five investigators assessed speech and language abilities from video both contexts: parental or caregivers' report and test forms of Thai Speech and Language Test for Children Aged 0-4 Years Old. Twenty-five normal and 30 children with delayed development or risk for delayed speech and language skills were assessed at age intervals of 3, 6, 9, 12, 15, 18, 24, 30, 36 and 48 months.

Results: Reliability of parental or caregivers' testing and reporting was at a moderate level (0.41-0.60). Inter-rater reliability among investigators was excellent (0.86-1.00).

Conclusion: The parental or caregivers' report form of the Thai Speech and Language test for Children aged 0-4 years old was an indicator for success at a moderate level. Trained professionals could use both forms of this test as reliable tools at an excellent level.

Keywords: Test, Speech and language, Reliability

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A systematic review revealed the overall prevalence of primary speech and language delay among children aged 2-6 years old was 6.0% (1.4-19%)⁽¹⁾. There was no national report of prevalence of delayed speech and language development in Thailand. Prevalence from speech clinics across country ranged from 23.4-46.8%⁽²⁻⁵⁾. These children cannot acquire speech and language skills in early life and have cascade of life long problems and burden for their family, society, and government administration and expenses. In addition, they suffer from school language related struggles, disappointments, failures and high cost of at-school treatment⁽⁶⁾. Early detection or diagnosis of delayed speech and language development will give early intervention which would help the children to have an equal or nearly normal language and speech development and to overcome difficulties in communication in individuals who have a high potential and decrease lifelong problems of family, society and

country. Early detection requires a test which provides an assessment and implications for intervention. A parental report, a form of a standard test is a common language screening device because it is simple, noninvasive and an essential procedure for elementary diagnosis. It is a predictor for further delayed speech and language development⁽⁷⁾. Therefore, an early report of speech and language assessment is necessary.

For reliability and validity of parental or caregiver reports and direct speech and language assessment, the previous studies revealed a controversy that was based on methodology, analysis, designing⁽⁸⁾, or/and types of tests. A study found low correlation between parental or caregiver reports and direct evaluation by professional or specialists⁽⁹⁾. On the other hand, several studies showed a high correlation⁽¹⁰⁻¹⁵⁾. Even though direct evaluation by specialists more likely would have had high correlations to the standard tests more than parental reports or screenings⁽¹⁶⁾, parental reports also provide important complementary information in the diagnostic process⁽¹⁷⁾ and high validity⁽¹⁸⁾.

Parental report forms of many language tests are available, however, they cannot be used for Thai

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children because language tests are generally based on a particular linguistic system and a translation might be not appropriate and have relevant structures in other languages⁽¹⁹⁾. Translations of tests from Western language countries that are developed and standardized on one population cannot be used with another the test language⁽²⁰⁾. Most existing Thai speech and language tests were developed based on age-specific vocabulary sets and the measurement of particular groups of words such as nouns, verbs, adjectives, adverb and classifiers including the comprehension and production of nouns among children between 2-to-5-years-old in kindergarten in the municipalities of Khon Kaen⁽²¹⁻²³⁾, the auditory comprehension of language in Thai children between 3 years and 4 years 11 months in Bangkok⁽²⁴⁾; auditory comprehension of some adjectives and prepositions among Thai children (3 years 6 months to 4 years 11 months) attending kindergarten in Bangkok⁽²⁵⁾; auditory comprehension of numeric classifiers among Thai children (3 to 7 years 11 months) in Phrawet, Prakanong and KlongToey districts of central Thailand⁽²⁶⁾; and a study of the production of antonym pairs among Thai children between 4 and 6 years 11 months in Muang district, Chonburi province⁽²⁷⁾. A study was done of auditory comprehension of children aged 3 years to 6 years 11 months in Bangkok by using the Thai version of the test for auditory comprehension of language (TACL-3)⁽²⁸⁾. These tests might assess specific domains of languages and are limited in their ability to imply children's global speech and language abilities and to trigger early intervention.

There is only one Thai language test that was translated from an international speech and language test: Receptive and expressive language of Thai children from birth to 36 months by using a Thai adaptation of the Receptive-Expressive Emergent Language Test (REEL-3)⁽¹²⁾ which originally was developed based on a non-Thai culture context language and adapted for Thai children. This test is performed by interviewing or reporting from parents and might be a useful tool to assess Thai language skills, however, it has limited use for children aged 0-3 years. There is another current existing Thai Speech and Language Test for Children between 0-4 Years (TSLT) that was developed based on the Thai culture and linguistic system^(29,30). This test was standardized for assessment of global language skills and can be applied with a cut off point at a 75 and 90 percentile for Thai children aged 0-4 years, however, a parental report is not available.

The objective of this study was to find 1)

Inter-reliability between the parental report and the test for Thai speech and language for children between 0 and 4 years of age and inter-rater reliability among professionals.

Material and Method

This cross-sectional study was conducted in the Speech Clinic, Srinagrind Hospital, Faculty of Medicine, Khon Kaen University, Khon Kaen. The children were recruited after gaining informed, written consent from their guardians. According to the Helsinki Declaration (HE541138), the Ethics Committee of Khon Kaen University reviewed and approved (July 21, 2011) the research protocols for Standardization of Speech and Language Test for Thai Children Aged 0-4 Years.

Participants

Inclusion criteria

Children aged 3-, 6-, 9-, 12-, 15-, 18-, 24- ($\pm 1\ 1/2$ months), 30-, 36- and 48-month-old (± 3 months) children, both normal and significantly delayed speech and language skills or health problems or physical, cognitive, emotional, social, sensory or neurological deficits that were diagnosed by a physician or speech and language pathologist as delayed development or risk for delayed speech and language development in 5 to 6 children at each age level. These children were diagnosed by a physician or speech and language pathologist and recruited from the speech clinic, well baby clinic, direct contact based on the registration unit, Srinagarind hospital or were referred by health providers.

Exclusion criteria

Children were excluded from the present study with very short attention spans or chronic sickness which prevented their ability to perform TSLT within 2 appointments or those whose home language was not Thai or a Thai dialect (Central, North, Northeast or South).

The number of participants needed was based upon a Cohen's Kappa coefficient = 0.8, proportion of observation = 0.56, proportion of expectation = 0.50, an absolute decision of 0.08 = 0.02 and dropout 0.20, the sample size is 55 children.

After a TSLT training workshop for 5 researchers via both live demonstration and practice with video presentations, individual cases were assessed for language and speech skills, using both caregiver's or parental reports and test forms for the 55

children with or without delayed language and speech development in each age interval with blinded diagnosis via video presentation.

Main outcome

The main component was a combination which was total score of receptive and expressive language for children aged 3, 6, 9, 12, 15, 18, 24, 30, 36, 48 months. For each age level language test, both the receptive and expressive language test was comprised of 3-40 items depending upon the language skills expected for each period. Each item was scored as dichotomous, pass or fail (pass = 1, fail = 0). All of receptive and expressive language scores were summarized as total receptive and expressive language scores or combined language scores. Data were performed into language quotients. The combined language quotient (CLQ) = [(receptive language scores + expressive language scores)/age (months)] x 100. To compare with norms using the criteria cut off points 75th and 90th percentiles (Prathanee et al, 2008, 2010), CLQ was interpreted to pass or fail (pass = 1, fail = 0). The score was recorded on a case record form for reliability analysis.

Statistical analysis

The individual case record form was certified by the principle investigator and scanned into the OMERET system (Online medical research tools), Faculty of Medicine, Khon Kaen University, which is an intelligent character recognition system. For quality assurance, certified data from OMERET output was examined and the data transferred to descriptive data by the principle investigator. Descriptive statistics: the percentage was used for analysis general characteristics. Cohen’s kappa statistics were used to assess reliability between the parental reports and test and inter-rater reliability among researchers by STATA version 10.

Results

The characteristics of subjects are presented in Table 1. Participants were randomly included on the first come and the first serve basis. They were composed of 25 normal and 30 children with delayed speech and language development. The proportion of females to males was about 4.7: 5.3.

For Cohen’s Kappa coefficients, TSLT scores between parental or caregiver’s report and researcher’s test criteria cut off point of 75th and 90th percentiles revealed moderate reliability (Table 2 and 3).

Table 1. Demographic characteristics of the children

Age (months)	Gender		Total	Percentage
	Female	Male		
3 ± 1 1/2	3	2	5	9.09
6 ± 1 1/2	4	1	5	9.09
9 ± 1 1/2	3	2	5	9.09
12 ± 1 1/2	-	6	6	10.90
15 ± 1 1/2	3	2	5	9.09
18 ± 1 1/2	3	2	5	9.09
24 ± 1 1/2	3	3	6	10.90
30 ± 3	1	5	6	10.90
36 ± 3	1	5	6	10.90
48 ± 3	3	3	6	10.90
Total	26	29	55	100

Table 2. Cohen’s Kappa coefficients between parental reports and test scores with criteria at the 75th percentile

TSLT forms Criterion 90%	Res. No.	TSLT* Test
	1	0.44 (0.22-0.66)
	2	0.58 (0.37-0.80)
	3	0.42 (0.19-0.65)
	4	0.49 (0.27-0.70)
	5	0.45 (0.22-0.68)

*TSLT = Thai Speech and Language Test for Children between 0-4 Years; Res No. = Researcher number

Table 3. Cohen’s Kappa coefficients between parental reports and test scores with criteria at the 90th percentile

TSLT forms Criterion 90%	Res. No.	TSLT* Test
	1	0.59 (0.37-0.80)
	2	0.60 (0.38-0.81)
	3	0.41 (0.17-0.65)
	4	0.55 (0.33-0.77)
	5	0.56 (0.34-0.79)

*TSLT = Thai Speech and Language Test for Children between 0-4 Years; Res. No. = Researcher number

Global inter-rater reliability of TSLT among 5 researchers (the principle investigator was reference person) are displayed in Table 4. Cohen’s Kappa coefficients revealed that agreements between

Table 4. Cohen's Kappa coefficients among researchers

Test	Kappa coefficients (95% confidence interval)
TSLT* Report Criterion 75 th Percentile	0.91 (0.80-0.96)
TSLT Report Criterion 90 th Percentile	0.89 (0.79-0.95)
TSLT Test Criterion 75 th Percentile	0.87 (0.73-0.94)
TSLT Test Criterion 90 th Percentile	0.88 (0.71-0.95)

* TSLT = Thai Speech and Language test for Children between 0-4 years

investigators criteria cut off point 75th and 90th percentiles were excellent reliability (K = 0.87-0.91).

Discussion

Direct speech and language assessment generally takes a long time and needs the children's cooperation and familiarity. This study showed that the direct TSLT approximately takes around 20-60 minutes for children aged 0-12 months and 60-90 minutes for children aged 15-48 months while the parental report takes approximately only 5-15 minutes for children aged 0-12 months and 15-20 minutes for children aged 15-48 months. The parental report generally saves more time (duration of parental report: direct test = 1: 4), therefore, the parental report is necessary for early assessment.

Cohen's Kappa coefficients between scores from parental or caregiver's reports and professionals' assessments with the two cut off points (75th and 90th percentiles) of TSLT revealed moderate reliability (0.41-0.60). These results support previous studies^(12,14,17,31). Various factors might influence this reliability, *e.g.* academic level of caregivers who reported information of children's language skill, caregivers' relation to children, or duration of home stay with children during testing period. Unfortunately, these factors were not included in the general information in the present study. It might be of more benefit if included in the planning for further research. Parental reports of TSLT should be included in the battery of tests or used as the elementary diagnosis and carefully interpret the results to predict language skills in children who are risk for delay speech and language development. It is an appropriate tool for early detection because it takes a short time and decreases the burden of professionals performing the direct or formal assessment, particularly in developing countries where there are insufficient speech and language services. Professionals can early onuse scores from parental reports for an estimate of the early expected language abilities and prognosis for the parents. A formal training workshop, however, is needed to quantify inter-reliability coefficients in the

further research and more sample size is needed to confirm the inter-reliability between parental reports and direct tests.

For global intra-rater reliability among investigators were in excellent agreement at both cut off points (75th and 90th percentiles) (K = 0.87-0.91). The results of the present study agreed with the previous Thai study⁽¹²⁾. Both forms of TSLT can be used by any speech and language pathologist or health care professional who has been well trained and standardized. In addition, assessment results might be compared across centers and regions in Thailand.

Conclusion

Reliability of parental or caregivers' forms and direct tests of TSLT was moderate, while trained professionals had the excellent inter-rater correlation. Professionals can use the parents reports form for screening and carefully interpret to predict speech and language skills. Further research is needed.

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Potential conflicts of interest

None.

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การเปรียบเทียบความเที่ยงของการสัมภาษณ์พ่อแม่และการทดสอบภาษาและการพูดภาษาไทย

เบญจมาศ พระธานี, นิภา อังศุภากร, ทวีตรี ภูมินำ, ชลดา สีพัชยาม, เพชรรัตน์ ใจยงค์

วัตถุประสงค์: เพื่อหาความสอดคล้องของการประเมินโดยการสัมภาษณ์พ่อแม่หรือผู้เลี้ยงดูและการทดสอบของแบบประเมินการพูดและภาษาของเด็กไทยอายุ 0-4 ปี

วัสดุและวิธีการ: คณะผู้นิพนธ์ 5 คน ประเมินภาษาและการพูดของเด็กไทยอายุ 0-4 ปี จากวีดิทัศน์ที่ทำการสัมภาษณ์พ่อแม่หรือผู้ปกครอง และการทดสอบในเด็กปกติจำนวน 25 คน และเด็กที่มีภาวะพัฒนาการล่าช้าหรือมีความเสี่ยงต่อการพัฒนาภาษาและการพูดล่าช้าจำนวน 30 คน ใน 10 ช่วงอายุ (3, 6, 9, 12, 15, 18, 24, 30, 36, 48 เดือน)

ผลการศึกษา: การสัมภาษณ์พ่อแม่หรือผู้เลี้ยงดูและการทดสอบจริงมีความสอดคล้องกันในระดับปานกลาง (0.41-0.60) มีความสอดคล้องภายในบุคคลอยู่ในระดับดีมาก (0.86-1.00)

สรุป: การสัมภาษณ์พ่อแม่หรือผู้เลี้ยงดูของแบบประเมินการพูดและภาษาของเด็กไทยอายุ 0-4 ปี เป็นตัวบ่งชี้การประเมินด้วยการทดสอบจริงได้ในระดับปานกลาง เจ้าหน้าที่ที่ได้รับการอบรมทุกคนสามารถใช้แบบประเมินทั้ง 2 รูปแบบเป็นเครื่องมือที่มีความตรงกันในระดับดีมาก
