ORIGINAL ARTICLE

THE VALIDATION OF THE MALAY PRESCHOOL LANGUAGE ASSESSMENT TOOL (MPLAT): THE SCREENING AND DIAGNOSTIC VERSIONS

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ABSTRACT

The paper describes the validation of the Malay Preschool Language Assessment Tool (MPLAT), a standardized normed referenced language assessment tool for Malay preschoolers within the ages of 4;0-6;11 and whose native language is Malay. The MPLAT (A Razak et al. 2010) is an assessment tool which is designed to assess the areas of receptive language, expressive language and early literacy skills. The MPLAT contains six subtests i.e. picture vocabulary, grammatical understanding, sentence repetition, referential meaning, relational meaning and early literacy skills. This paper is divided into 2 studies. Study 1 tested the psychometric properties and normative data of the diagnostic version of MPLAT on 300 participants recruited from preschools in the rural area of Gua Musang and the urban area of Kota Bahru located in the East Coast state of Kelantan. The construct validity is high with a strong correlation (r = 0.942) between test scores and age, validating the developmental nature of the test. There was also moderate to strong positive correlation between each subtest and the test total, as well as between subtests. It also has high test-retest reliability (r = 0.998 (p < 0.01) and inter-rater reliability (rho = 1.000). The second study looked at the psychometrics properties of the MPLAT short version (screening) compared to the full version diagnostic. The short version of MPLAT is about a quarter of the full (diagnostic) version. About 108 subjects in the urban area of the the Klang Valley, consisting of Kuala Lumpur and Selangor, were administered both versions of the MPLAT. The Pearson correlation revealed a strong positive correlation between the total scores and age (r = 0.718, p<.01), and strong positive correlation for the test-retest reliability (r = 0.881, n=12) for the short MPLAT version. For the full version, the Spearman correlation revealed a strong positive correlation between total scores and age (r = 0.791, p<.01) and a very strong positive Pearson correlation for test-retest reliability (r = 0.943). Cronbach's Alpha values demonstrated the internal consistency of the full version (0.972) and short version (0.929). In summary, both versions of the MPLAT were found to be valid tools to screen and diagnose language problems among Malay preschool children in Malaysia. MPLAT also has the potential to be a useful research tool to delineate language development of the preschool Malay children.

***Key words**: Malay Preschool Language Assessment Tool (MPLAT), screening tool, diagnostic tool, language assessment, Malay preschool children, test development, test validation*

INTRODUCTION

Assessing language among preschool children plays an important role in the field of speech pathology[1-5]. About 6% to 8% of children in the United States between the age of 1-7 years old who faced various speech and language difficulties, while the incidence of language disorders is estimated at about 2.3% to 19% of the children's population in the United States[6-8].

Language assessments are an important and critical first step in the diagnosis and treatment of language disorders. There are various types of assessments available, but the standardized, norm - referenced assessment remains the cornerstone of the assessment procedure[9]. The process of standardization, collecting of normative data, and determining of psychometric properties are crucial to the credibility and usefulness of an assessment. The aim of this article is to describe the validation of the MPLAT short and full versions by reporting its psychometric properties.

This article reports on two studies. The first study looks at the partial standardization of MPLAT full version, specifically reporting its psychometric properties and the normative data collected among Malay preschool children in Kelantan. The second study looks at the the psychometric

properties of the MPLAT -the short version (screening test) by comparing it to the MPLAT –full version (diagnostic test). The second study population recruited Malay preschool children in the Klang Valley.

LITERATURE REVIEW

To date, there is no local standardized language assessment tool which can be used to differentiate between children at risk of language delay/disorders or with their typically developing peers[10-11]. In this study, a survey was carried out on 100 speech-language therapists (SLTs) in government hospitals and clinics, private hospitals, government hospitals, and Ministry of Education in Malaysia. Even though the response rate was only 20%, the feedback from respondents were insightful. They agreed that local assessment tools are urgently needed to assess the speech and language abilities of Malaysian children. 7% of respondents reported using language profiles with adult patients with aphasia, paediatric patients with language delay, Down Syndrome and Autism. Respondents also reported on the lack of local normative data on typically developing children which has made the assessment work done on children with communication disorders more difficult. Joginder Singh et. al examined practice patterns among 152 Malaysian SLTs in managing children with speech and language delay/disorder through a web-based survey[11]. The return/response rate was 37% (56 respondents). SLTs in Malaysia (63.2%) was found to be implementing less evidence-based practices due to insufficient exposure to research, limited availability of resources, time-constraints to read and understand the resources. In turn, Malaysian SLTs tended to depend on their personal clinical experience when managing cases. They also reported challenges working in an environment with limited local standardized resources for their assessment and intervention needs. This led to a situation where most of the SLTs in Malaysia had to depend on behavioural observations (64.1%), interviews and questionnaires (64.1%) and imported adapted developmental scales with Western norms (53.8%) in obtaining information about their clients.

There is currently no standardized norm-referenced language assessment for preschool children in Malaysia. The Malaysian Developmental Language Assessment Kit (MDLAK)) which is widely used in Malaysia is based on developmental approximate norms, and it has yet to be standardized on the local population[12].

Language assessments for children play an important role in the early identification of language disorders. It is well documented that the earlier a child is assessed, identified and starts intervention, the better the outcome will be[13-17]. Available evidence suggests that successful outcomes for children with speech and language disorders are maximized by early intervention. For children who are at risk of speech and language disorders, early intervention might be critical for their academic success in school.

The assessment procedure and especially the findings and results of the evaluation are extremely critical as important decisions are made based on these results. The outcome of an assessment often determines an individual's eligibility for special needs and welfare funding. Thus, the quality and appropriateness of an evaluation procedure is important not only to individuals with language impairment, but also to the clinician, service providers, and funding agencies (Agency for Healthcare Research and Quality)[18].

The Agency for Healthcare Research and Quality, USA, in its paper on Criteria for Determining Disability in Speech-Language Disorders required the following criteria for an assessment to be able to adequately diagnose speech language disorders[18]:

(i) The test should have acceptable reliability which consists of internal consistency, test-retest reliability and inter-rater reliability. The internal consistency reliability was set at 0.90 or greater, measured using either Cronbach's coefficient alpha or Kuder-Richardson statistics (K-R 20). The test-retest reliability was set at 0.90 or greater if measured using a correlation coefficient, or greater than or equal to 0.80 if measured using Cohen's Kappa. As for inter-rater reliability, it is set at 0.90 or greater if measured using a correlation coefficient, or greater than 0.80 if measured using Cohen's Kappa.

(ii) The test should meet the criterion for validity, which requires that Instrument developers examine relationships between subtests, composite scores, and total scores, establishing a hypothesis for these relationships and for patterns of scores for individuals belonging to various groups included in the normative sample. All these relationships should be statistically

significant at $p<0.05$. As for correlation coefficients, the magnitude of the relationship is at least 0.30, thus providing evidence of a moderate correlation.

(iii) The normative data should provide information on the target population that the assessment instrument is meant for. An adequate sample size should be used, that is a minimum of 100 subjects per group. This requirement fits well with recommendations set in the study by McCauley where the ideal normative sample should include at least 50 children within six months age range of the target test population. [19]

The Malay language has a number of regional dialects. Dialects is defined as the language variety that exists due to the speakers in certain regions. The Malay language is divided into seven dialect groups based on the respective regions: northern western group (Kedah, Perlis; Penang and North Perak); North Eastern group (Kelantan, Trengganu); Southern group (Johor, Melaka, Pahang), Central group (Selangor and Kuala Lumpur) and states having their own dialects such as Negeri Sembilan, Sabah, Sarawak[20]. In this study, we have chosen two Malay dialects: the Kelantan and Central dialect based on the fact that Kelantan lies on the extreme end of the dialect continuum while the Central Dialect (or referred to the standard dialect) is in the middle of the spectrum. The mutually intelligibility of the Kelantan Malay dialect is considered low when compared to the Central dialect[21]. The Kelantan dialect differs from Standard Malay (SM) in terms of phonology, lexical items, morphology and syntax. The highest degree of divergence is in phonology while syntax has the lowest degree of divergence[22]. Therefore, choosing the Kelantan dialect and the Central Dialect is suited to the scope of testing MPLAT as MPLAT is focussed on the morphology and syntax only. While the two dialects differ yet they are suited to the purposes of MPLAT i.e testing the grammar (morphology and syntax) and lexical semantics.

The Malay Preschool Language Assessment Tool (MPLAT) is a child language assessment tool that consists of six subtests measuring language skills in receptive, expressive language and early literacy skills. It is designed as a language assessment tool for preschool children who are native speakers of Malay language in Malaysia[20]. MPLAT has six subtests: receptive (picture vocabulary, grammatical understanding subtests); expressives (referential meaning, relational meaning and sentence repetition), and early literacy skills (Table 1). MPLAT has two versions: the full version (diagnostic) and the short version (screening). The diagnostic and screening versions can be used by SLTs while the screening version can also be used by preschool teachers. Estimated administration time for the diagnostic version is 30-45 minutes and 10-15 minutes for the screening version. The screening version is approximately one third in size compared to the diagnostic version. MPLAT has obtained a statutory declaration of copyright invention for its intellectual content and form in 2014 in line with the section 7(3)b of the Malaysia Copyright Act 1987.

The MPLAT is designed to assess the following linguistic aspects of language, which are morphology, syntax and semantics in receptive and expressive language.[20] This is largely influenced by the vocabulary, phonology, syntax, semantics, pragmatics, and literacy as important aspects of language development, attributing their key role towards preschool children school readiness.[21] It tests the modality of listening, speaking and writing/reading. It was constructed based on the frameworks used in the Test of Language Development TOLD, the Peabody Vocabulary Picture Test, PPVT and the Test of Written Language-3, TOWL-3[22-24]. The vocabulary for the items in the test, namely of object and action words were based on Malay preschool story books, preschool language workbooks, and picture dictionaries available in the Malaysian market.

Table 1 MPLAT: *subtests, number of items, and total score*

VERSIONS OF MPLAT & SUBTESTS				
Version/Subtests	**MPLAT Diagnostic Version (Full)**		**MPLAT Screening Version (short)**	
SUBTESTS	**Total Items**	**Total Score**	**Total Items**	**Total Score**
RECEPTIVE				
Picture Vocabulary	40	40	12	12
Grammatical Understanding	20	20	5	5
EXPRESSIVE				
Sentence Repetition	24	24	6	6
Referential Meaning	20	20	5	5
Relational Meaning	35	35	9	9
EARLY LITERACY SKILLS	20	31	12	18
TOTAL	**159**	**170**	**49**	**55**

An initial pilot study was conducted on 59 subjects aged 4;0 – 6;11 in the Klang Valley, which is in the urban areas of the Klang Valley consisting of the states Federal Territory and Selangor, located in the Central Peninsular of Malaysia. The findings showed that the MPLAT is developmental in nature as overall test scores and scores for the subtests progressed well with age[20]. There was a significant correlation between age and total scores on all the subtests. An item analysis was also done on items of all subtests in order to improve the quality of the items and subtests.

A subsequent small scale premilinary reliability and validity study had also shown promising results[25]. The study was conducted on 42 Malay preschoolers aged 4;0 to 6;11 in the Klang Valley. The test results showed an increase in scores with age, confirming it to be developmental in nature. The test–retest reliability was based on 6 subjects tested at two weeks interval. Inter–rater reliability was also based on 6 subjects tested by two different raters. The correlation for the total test scores in the test–retest reliability was strong, r = 1.0. Correlation for the subtests scores were also moderate to high. Inter–tester reliability was also analyzed using the Spearman correlation and correlation for all subtests and total score was found to be high, r = + .971. The content validity was assessed by two SLTs and one linguist whose area of expertise is in the Malay language. All three professionals agreed that all subtests fulfilled their assessment purposes and the test items were suitable to be used on Malay preschoolers[26]. Considering the important role that a language assessment plays in the process of identification and remediation of language disorders, it is imperative that due care be taken during the standardization process in developing a test. The stages in the development of a standardized language assessment are vital as the interpretation of the test results rely heavily on these data. Hence, stringent, evidence-based measures had been adopted throughout this study in obtaining the normative data and to determine the psychometric properties of the MPLAT tool, a newly-developed Malay language assessment tool.

STUDY 1: STANDARDIZATION OF MPLAT

METHODOLOGY

This study is aimed at collecting normative data in the state of Kelantan, located on the East Coast of the Malay Peninsular. At the same, it is intended to determine the reliability and validity of the MPLAT (diagnostic) among preschoolers in Kelantan. This is a prospective cross sectional study.

Participants

The sample for this study consisted of 300 preschool children divided into six age groups, as summarized in Table 2. It is recommended that a good normative sample for language assessment tool should have at least 50 participants within a six – month age range of the target population[19].

Table 2: ***Number of participants in each age group***

Age-group	N	Mean Age (months)
4;0-4;5	50	50.48
4;6-4;11	50	56.2
5;0-5;5	50	62.58
5;6-5;11	50	68.96
6;0-6;5	50	74.5
6;6-6;11	50	80.22

Participants were randomly selected from preschools in Kelantan. A multi-stage sampling procedure was employed. In the first stage, kindergartens were selected from various districts in Kelantan. In the second stage, participants were selected from the kindergartens, stratified according to age and gender. Participants were not controlled for socioeconomic status but a well distributed sample proportionate to the preschool population was obtained through the randomization. Two data location sites were identified: the urban area of Kota Bharu, the capital city of Kelantan and the rural Gua Musang, which is the largest district located in Southern Kelantan and is about 140 km from Kota Bharu[20].

Participant Selection Criteria

Participants were selected based on the following criteria:

a) Inclusion Criteria

1. Malay ethnic residing in Kelantan.
2. Their mother tongue is the Kelantan Malay dialect.
3. Reported by their parents and teachers to have typical language development.
4. Aged 4;0 – 6;11.
5. Consent was obtained from parents for their child to participate in this study.

b) Exclusion criteria

1. Have physical or mental disorder.
2. Have syndromic or hearing disorder.

PROCEDURE

Prior to the actual assessment of MPLAT, parents completed a biodata form in which details regarding their child's language functioning were obtained, indicating that the children's language was on par with their peers. A pilot study was also conducted with ten typically developing Kelantanese preschoolers to assess the suitability of MPLAT.

The MPLAT assessment was conducted individually in a quiet room at the kindergarten. The order of presentation was in the following order: Picture Vocabulary; Sentence Repetition; Grammatical Understanding; Referential Meaning; Relational Meaning; Early Literacy Skills. Each subtest has two to three practice items prior to the administration of the actual subtest items. During the practice items, the target word or sentence may be repeated if needed. During the actual test, no repetition of items was given. After the practice items, the MPLAT will be administered. It takes about 30-40 minutes.

RESULTS & DISCUSSION

Generally, the total scores of the MPLAT demonstrated an upward trend with the increase in age. Figure 1 showed a good progression of the performance: rising mean score across the increasing age-groups.

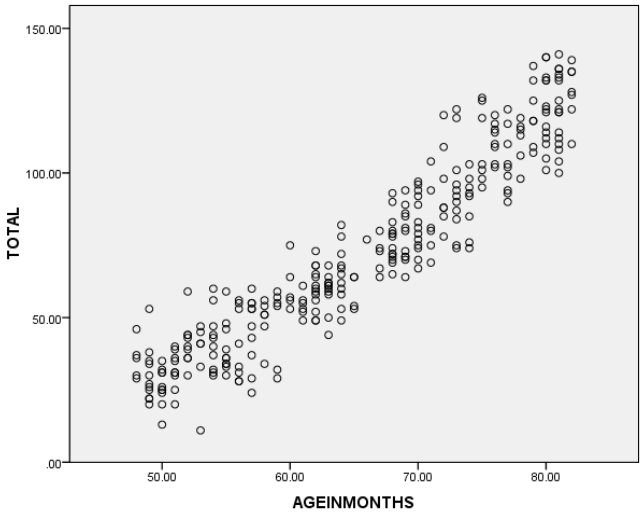
Table 3: ***Mean of total test scores across the age groups***

Age group	N	Mean (Standard Deviation)	95% CI	
			Lower bound	Upper bound
4.0 – 4.5	50	32.96 (9.57)	30.24	35.68
5.0 – 5.5	50	60.22 (7.94)	57.96	62.48
5.6 – 5.11	50	79.02 (9.68)	76.27	81.77
6.0 – 6.5	50	100.06 (14.27)	96.00	104.00
6.6 – 6.11	50	121.18 (11.99)	117.77	124.59

Table 4: ***Normative scores for MPLAT test total***

Age group	Normative scores
4.0 – 4.5	13.82 – 52.1
4.6 – 4.11	21.7 – 65.3
5.0 – 5.5	44.34 – 76.1
5.6 – 5.11	59.66 – 88.7
6.0 – 6.5	71.52 – 128.6
6.6 – 6.11	97.2 – 145.16

Figure 1: ***Scatterplot of test total scores and sge***



Findings from this current study are similar to the previous studies involving preschoolers from the Klang Valley[25]. Although the number of participants in the previous study was only 59, the mean scores also showed an increase with the increase in age. The range of test total scores were also similar.

RELIABILITY SCORES

The following section presents the test–retest correlation scores and the inter–rater correlation scores.

Test – retest correlation scores

A total of 36 participants were randomly selected to be retested, 6 participants from each age group. They were retested two weeks after the first test. The test and retest scores were correlated using the Spearman rho as the data was not normally distributed. The test–retest correlation scores are summarized in Table 5.

High levels of correlation between the test and retest scores from the current sample suggest that the test has good reliability in the form of temporal stability. High correlation could also be attributed to learning effect. However, this learning effect was minimized when a gap of 14 days between the first and second test administration was observed.

This is also confirmed by the test – retest reliability value from a previous normative data collection study which were also high, indicating that the MPLAT has good temporal stability[25].

Inter – rater reliability

Two participants from each age group, that is a total of 12 participants were randomly selected to investigate the inter–rater reliability. The 12 participants were then retested by a different independent tester after 14 days. The second tester was blinded to the scores of the first assessment for all the participants.

The non–parametric correlation of Spearman's rho was used as the number of participants involved was small and the data was not normally distributed. The correlation between the scores obtained by both examiners for the test total and each of the subtests are summarized in Table 5, together with the rest–retest scores.

Table 5: ***Test – retest & Inter – rater reliability***

Subtest	Test – retest reliability N = 36 Spearman, rho = (p<0.01)	Inter – rater reliability N = 12 Spearman, rho = (p<0.01)
Total test scores	.996	1.000
Picture Vocabulary	.989	.986
Grammatical Understanding	.921	.922
Sentence Repetition	.976	.989
Referential Meaning	.972	.968
Relational Meaning	.984	.998
Early Literacy	.978	.988

High correlations for both the test–retest and inter–rater reliability measures suggest that MPLAT is a stable assessment, both in terms of temporal and examiner. Participants scored quite close on their first and second attempts at the test, and even with a different examiner. Inter–rater reliability was also examined in a previous study[25]. The results were found to be similar with the current findings, i.e. with high inter–rater reliability for all the age groups.

This finding suggested that the MPLAT has good reliability. The influence of learning effect on the retest and inter – rater scores was minimized.

CORRELATION OF MPLAT SCORES WITH AGE

The correlation between the test scores and the age in months was analyzed using the Spearman correlation. The correlation between the test scores and the age of the participants are shown in Table 6.

Table 6: ***Correlation of test scores with age of participants***

Correlation between age and test scores	Spearman Correlation , rho (p < 0.01)
Test total	.949
Picture Vocabulary	.806
Grammatical Understanding	.585
Sentence Repetition	.762
Referential Meaning	.802
Relational Meaning	.828
Early Literacy	.857

The correlation of scores with age is contributed by the performance of each age group on the subtests. For the test total, subtests of picture vocabulary, sentence repetition, referential meaning, relational meaning, and early literacy, there is a high correlation between the scores and the age. These scores showed significant increase with age. For the grammatical understanding subtest, the correlation is lower, as the scores did not increase much from one age group to the other. This could be due to the fact that understanding of grammar and its use in sentences are still developing for children within this age range.

This set of data contributed evidence that the MPLAT had good validity. The construct validity of the MPLAT is based on the development of language skills with age, and it was predicted that the scores on MPLAT would increase with age.

CORRELATION OF SUBTEST SCORES WITH THE TEST TOTAL

Each subtest is claimed to be assessing an area of language development that would contribute to the overall picture of the participants' language development. Each subtest was found to be at least moderately correlated with the total test scores. The correlation of subtest scores with the test total was calculated using the Spearman correlation and is summarised in Table 7.

Table 7: ***Correlation of subtest scores with test total***

Correlation between subtest and test total	Spearman Correlation, rho (p < 0.01)
Picture Vocabulary	.853
Grammatical Understanding	.652
Sentence Repetition	.807
Referential Meaning	.835
Relational Meaning	.877
Early Literacy	.889

These results showed that the test has good reliability and all the subtests contribute appropriately to the test total score to provide an accurate measure of the participant's language functioning skills.

Overall, the total test scores increased with age as predicted. The developmental construct of the MPLAT was proven by a second statistical test; by the differences between age groups for total MPLAT scores [$F(294,5) = 480.82$; $p < 0.05$]. The post – hoc analysis is presented in Table 8.

Table 8 : ***Duncan's Multiple Range Test for differences between age groups for MPLAT test total***

Age Group	Count	Mean	Different from groups
1	50	32.96	2, 3, 4, 5, 6
2	50	43.5	1, 3, 4, 5, 6
3	50	60.22	1, 2, 4, 5, 6
4	50	79.02	1, 2, 3, 5, 6
5	50	100.06	1, 2, 3, 4, 6
6	50	121.18	1, 2, 3, 4, 5

(note: Age group 1 = 4;0 – 4;5 years old, 2= 4;6 – 4;11, 3 = 5;0 – 5;5, 4 = 5;6 – 5;11, 5 = 6;0 – 6;5, and 6 = 6;6 – 6;11)

With regards to the the correlation scores, the high correlation could be attributed to the process of item analysis on each item in the subtests which the tool was subjected to in the previous stage.

In the absence of a gold standard to compare the MPLAT full version with, both types of construct validity were employed i.e the developmental method and the contrasting group method. This is based on the general expectation that language skills increase with age. The hypothesis being tested was that performance on the language assessment test will increase with the increase in age[24]. The contrasting groups method, however, tested a different hypothesis – that is different groups of children with known different abilities will perform significantly different on the test. This was also supported by Curtis (2004).

There were instances where the influence of the local Kelantan dialect was noted. There are lexical variations, phonological variations and world view variations which were influenced by the Kelantan dialect. One main area was in terms of the lexicon, where a word in the Kelantan dialect was used in order to aid comprehension and elicit a correct response. Participants also responded with answers in the local dialect that were not in the standardized answer key. Words such as *misi* for *jururawat* [nurse]; *pekong*, *lontar* for *membaling* [to throw], *bertempuh* for *kemalangan* [accident] etc were used. These familiar dialectal words are noted and will be accepted as variation of responses that SLTs can expect when testing children in Kelantan. It is imperative that dialectal variations be treated as what they are, different from the standard form, yet representing the intended meaning and is not penalized as a deficit. This is In line with (Rodekohr & Haynes, 2001).

This body of data, although substantial, is one part of the overall norming process. More data, especially from language impaired participants, will be needed for meaningful interpretation. For concurrent validity, it is suggested that participants' scores on the MPLAT be compared with scores from another test, such as the Malaysian Developmental Language Assessment Kit (MDLAK) or based on clinicians' clinical judgment. Predictive validity can also be determined by following a group of preschool participants and comparing their scores with language and literacy scores of primary one school children. These measures will yield a wealth of information and provide help in establishing a reliable and valid assessment.

Study 2: Psychometric characteristics of MPLAT short (screening) version

The objective of the second study was to determine the reliability and validity of the MPLAT short version (screening) as a potential screening tool to screen the language abilities of Malay preschool children. The overall performance of subjects on the MPLAT short version and MPLAT full version is compared. The reliability in terms of test re-test, face validity and concurrent validity of both versions of MPLAT were carried out.

METHOD

108 Malay preschool children aged 4;0 to 6;11 years old were recruited in the Klang Valley area as shown in Table 9.

PROCEDURE

Prior to the actual assessment of MPLAT, a biodata form was filled in by the parents of the participants. The MPLAT short version was conducted one-to-one in a quiet room at selected kindergartens. The order of presentation was in the following order: Picture Vocabulary; Sentence Repetition; Grammatical Understanding; Referential Meaning; Relational Meaning; Early Literacy Skills. Each subtest has two to three practice items prior to the administration of the actual subtest items. During the practice items, the target word or sentence may be repeated if needed. During the actual test, no repetition of items was given. After the practice items, the MPLAT will be administered. Each testing session was about 10-15 minutes.

Table 9: ***Numbers of subjects***

Age range (years)	N	M	F	Min Age (years)
4;00 – 4;05	18	9	9	4;02
4;06 – 4;11	18	9	9	4;07
5;00 – 5;05	18	9	9	5;02
5;06 – 5;11	18	9	9	5;07
6;00 – 6;05	18	9	9	6;01
6;06 – 6.11	18	9	9	6;07

RESULTS & DISCUSSION

In general, the mean score of subjects increased with the increase in age (Table 10). A drastic increase is found among the age groups 4;6-4;11 and 5;0-5;5, and also the age groups 6;0-6;5 and 6;6-6;11.

Table 10: ***Overall performance of subjects - mean score, standard deviation on MPLAT-full and MPLAT-short versions***

Age groups	MPLAT			
	MPLAT short version		MPLAT full version	
	Mean = μ (n=55)	Standard dev (□)	Min = μ (n=170)	Standard dev (□)
4.0 – 4;5	21.61	6.77	36.94	18.62
4;6 – 4;11	23.69	6.10	45.44	15.31
5;0 – 5;5	29.19	5.77	51.50	15.92
5;6 – 5;11	32.56	6.64	76.72	23.26
6;0 – 6;5	34.61	7.21	75.39	21.28
6;6 – 6;11	45.50	3.33	115.72	18.89

Due to the scores which were not distributed normally for both versions of MPLAT, the Spearman Rank correlation was used to determine the correlation of both the scores from subtests of the MPLAT short and full version to the test total. In Table 11, the subtests of MPLAT short version showed correlation values of between weak to very strong, whilst the subtests of MPLAT full version showed significant values (p<.001) of between strong to very strong. Overall, Table 11 demonstrated both versions have positive correlations and is significant at $p = 0.862$.

Table 11: ***Correlation between the subtests of both short and full MPLAT with total score***

Subtests	MPLAT	
	MPLAT short version Correlation value (rho=ρ)	MPLAT full version Correlation value (rho= ρ)
Picture vocabulary	0.574***	0.866***
Grammatical understanding	0.500**	0.765***
Referential Meaning	0.535***	0.606***
Relational Meaning	0.525***	0.837***
Sentence Repetition	0.761***	0.808***
Early Literacy Skills	0.879***	0.888***
Total marks	0.718***	0.791***

Significance at ***p < 0.001

Table 12 shows the results of the Spearman Rho correlation between subtests of the MPLAT short and full verison. The subtests of both versions has positive and strong correlations (p = 0.862).

Table 12: ***Correlation between subtests of MPLAT short and full versions***

Subtests	Correlation value (rho= ρ)
Picture Vocabulary	0.429***
Grammatical understanding	0.542***
Referential meaning	0.388***
Relational meaning	0.734***
Sentence repetition	0.431***
Early literacy skills	0.896***
Total score	0.862***

Significant at ***p < 0.001

A test-retest reliability was conducted on 12 subjects within a time period of one week after the first test was administered.[27] Table 13 and Figure 2 presented the test-retest results. A significant comparison i.e. Pearson correlation or the Spearman correlation respectively was obtained, based on whether the data was normally distributed or not.

Table 13: ***Correlation between the scores obtained on first and second tests for each sub-tests in both versions of MPLAT***

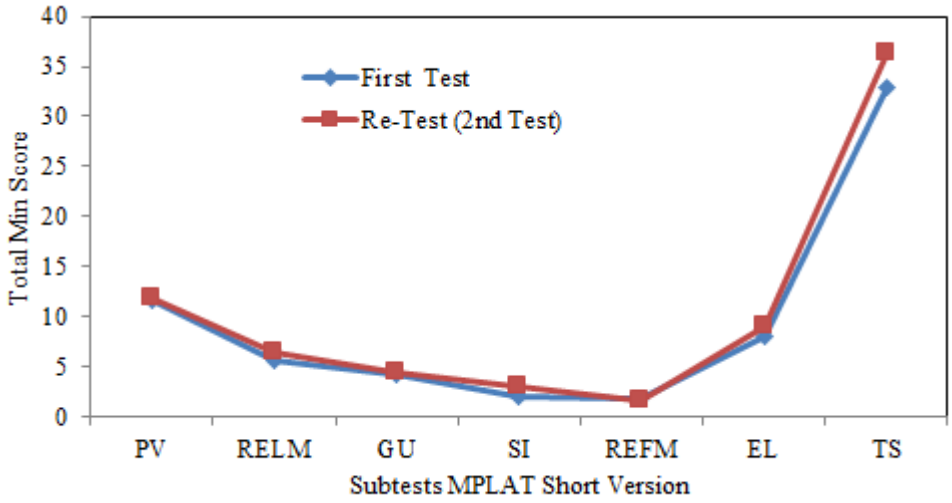
Subtests	MPLAT		
	Short version Correlation value	Full version Correlation value	N
Picture Vocabulary	0.421	0.686*	12
Relational Meaning	0.622*	0.770*	12
Grammatical understanding	0.184	0.724*	12
Sentence repetition	0.367	0.859**	12
Referential meaning	0.695*	0.680*	12
Early literacy skills	0.966**	0.952**	12
Total score	0.881**	0.943**	12

Note: * significance at the level p<0.05, ** significance at the level p< 0.001

The correlation value shows 0.943 for the full version MPLAT and was significant at the level p < 0.01. Meanwhile, the Pearson correlation value for the total score of MPLAT short version showed positive strong correlation 0.881 for this group of subjects and was significant at the level of p < 0.01. Therefore, a strong correlation is found between the MPLAT short and MPLAT full version.

Figure 2 shows the mean score performance of subjects at the first and second testing displaying equivalent values for all subtests. It was noted that the mean score for the receptive language subtests was higher than the mean scores for expressive language. For the expressive language, the Relational Meaning subtest seemed to be easier than the Referential Meaning and the Sentence Repetition subtests. The total score at second testing showed a slight increase compared to the first testing.

Fig. 2: ***Test-retest values for the MPLAT short version (screening)***



NoNote: PV = Picture Vocabulary, RELM= Relational Meaning, GU= Grammatical Understanding, SR= Sentence Repetition, REFM = Referential Meaning, EL= Early Literacy,TS= Total Score

Face Validity

Five preschool teachers were selected to conduct the face validity for MPLAT short version (screening). They were given an evaluation form which had the likert scale format of 1-2: totally unsuitable, 3-4: not very suitable,5: quite suitable,6-7: suitable, 8-9 very suitable in terms of the suitability of the content, form and world view of the preschool children population[28]. 96% agreement was reached among the five preschool teachers. This confirmed that the MPLAT short version is suitable as a screening test and is testing what it claims. It also assessed the targeted aspects of language and early literacy, which are important skills to have at this age.

Concurrent validity

Concurrent validity was performed by obtaining the correlation value of each subtests of both versions of the MPLAT. The MPLAT full version was standardized earlier in 2013. The Cronbach's Alpha-Coefficient analysis was used to measure the concurrent validity of the MPLAT short version to the MPLAT full version. There was a significant difference in the Cronbach Alpha-Coefficient of both versions of MPLAT. The correlation results showed correlation values of between 0.562-0.945 (short version) and 0.6689-0.972 (full version). In general, a correlation value greater than 0.70 is considered to be a very good and strong correlation, and this confirmed that the MPLAT short version is a reliable and valid test.

Table 14 presents the results of the concurrent validity. The alpha coefficient of the overall score for the MPLAT full version (diagnostic) showed very high and strong (r = 0.972) and the screening MPLAT short version also showed very strong alpha values (r = 0.929).

Table 14: ***Correlation scores of MPLAT short version to MPLAT full version for concurrent validity***

Subtests	MPLAT			
	Short version		Full version	
	Cronbach's Alpha value	Number of items (n)	Cronbach's Alpha value	Number of items (n)
Picture vocabulary	0.643	12	0.815	40
Grammatical understanding	0.562	5	0.952	20
Referential meaning	0.759	5	0.911	20
Relational meaning	0.655	9	0.908	35
Sentence repetition	0.883	6	0.689	24
Early literasi skills	0.945	12	0.961	31
Test total	0.929	55	0.972	170

The test-retest as a form of reliability measure proved the stability or strength of the MPLAT short version (screening). The 96% agreement through face validity testified to the usefulness of the MPLAT short version as a useful tool to screen language problems amongst preschool students in Malaysia.

Furthermore, concurrent validity between the MPLAT short and full version showed that the Alpha values between both versions were between 0.70 and 0.95. The MPLAT short version showed a low value on the Picture Vocabulary (0.643) and Grammatical Understanding (0.562). These low alpha values could be attributed to the small number of items in the test and this is supported by a previous research[30].

Screening tests are effective, simple, quick and easy to use to screen large numbers of pre-school children in a relatively short period of time. Screening tests typically take about 10 minutes to run by testers without specific training. Therefore, the MPLAT short version (screening) satisfied these specifications and could be used by preschool teachers to screen children who seem to be at risk of speech and language delay/disorders.

Limitations of the study

While great care has been taken throughout the study, improvements could be made. The manner by which the subjects were selected might be a limitation. The participants were chosen based solely on reports by parents and teachers. Their status of having typically developing language skills as per the inclusion criteria is based on the perception of parents and teachers, with no clinical evaluation or confirmation of their language status. However, sufficient published evidence do show that parent and teacher reports are sufficient to determine the language functioning of a child.

CONCLUSION

The results showed that there was a significant difference in the development of language and early literacy across the different age groups of children for the both the MPLAT versions. MPLAT diagnostic is a standardized tool while the MPLAT short version has shown strong reliability and validity equivalence to the MPLAT full version. MPLAT both full and short versions have been proven to possess good psychometric properties and can be used to assess Malay preschool children who might be at risk of language delay/disorders. MPLAT is the first linguistically and culturally appropriate standardized language tool in Malaysia as it is based on the Malay language and normed on typically developing Malay children. With little trainning, the MPLAT screening version can be used by preschool teachers to do a quick screen of their students who might be at risk of language delay/disorder and subsequently can be refered to SLTs for further management.

MPLAT also has the potential to be a useful research tool to delineate language development of Malay preschool children.

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