Original Research

The Effect Of Mean Length Utterance On The Complexity Of Syntactic Structure In 4-6 Year Old Children

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ABSTRACT

Background: Mean Length Utterance (MLU) results from dividing the total morphemes by the child's number of utterances. MLU is an indicator of gross language development in children. The more the vocabulary the higher will be the development of language acquisition and so will be the MLU score and the more complex will be the sentence structure so that language development can be known, especially grammatical aspects including syntax and morphology. Syntactic complexity is the range of sentence complexity levels based on its syntactic structural components. This study aims to determine whether or not there is an effect of Mean Length Utterance (MLU) on the complexity of the syntactic structure of children 4-6 years old in Demakan Village.

Methods: This study used a quantitative method, correlational design and cross sectional approach. The populations in this study were children aged 4-6 years in TK Desa Demakan 01 and Klinik Belajar Bahasa Bicara Sukoharjo. Sampling was conducted using purposive sampling with 30 children. 15 children aged 4 years, 9 children 5 years old, and 6 children 6 years old. This study conducted in November 2022 until Februari 2023. The spontaneous language sampling analysis used to measure MLU and syntactic complexity.

Results: The results of the statistical correlation test using Spearman-Rank analysis obtained a p value of 0.001 (p <0.05) meaning that Ha is supported or there is an effect of MLU on the complexity of the syntactic structure of children 4-6 years in Demakan Village. The r value of 0.644 implies that there is a "strong" effect with a positive correlation.

Conclusion: There is an effect of the Mean Length Utterance (MLU) on the Complexity of the Syntactic Structure in 4-6 Year Children in Demakan Village. This correlation usefull to make conclusion of assessment process especially relation between language variables.

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INTRODUCTION

Mean Length Utterance (MLU) is a concept used to measure linguistic product produced by a child. MLU is an indicator determine the language development status (Klatte et al., 2022; Murphy et al., 2022; Pavelko et al., 2020). The higher the MLU of child, the higher will be the child's language mastery (Pratomo, 2022). Thus, the higher the morpheme number, the higher will be th MLU score (Pavelko & Owens, 2023).

Empirically, if MLU of children increases, it syntatic form will be more complex (Potratz et al., 2022). In other words, child can create a complex sentence structure using complete sentence element including subject, predicate, object, and adverb. The mean length utterance of words (MLU in word) is considered very useful to detect the child's language development. The formula of MLU calculation is found through dividing the number of words by the total number of utterances . MLU in word is also considered as a basic element used to measure general language development in children (Marques & Limongi, 2011) because the mean length of utterance will affect morpheme to be uttered and thereby affect MLU of child directly. Children between 15 and 30 months age, according to Brown (1973) in (Shipley & McAfee, 2021), are expected to have MLU in morpheme (mean length of utterance measured in morpheme) of 1.75 morpheme. MLU in morpheme will improve gradually because children experience language ability improvement.

The case of problem in syntax increases in number so that some studies have been conducted on the problem. In addition, studies have been conducted on MLU and syntax. Nevertheless, previous studies on MLU and syntax have not discussed specifically the complexity of syntactic structure so that a studies is necessary to do to reveal in more depth the effect of MLU on the complexity of syntaxtic structure, viewed not only from word pattern and unit but also from a whole. Considering the elaboration above, the authors want to conduct a study on the effect of MLU on the complexity of syntactic structure in 4-6 year children in Demakan Village.

MATERIALS AND METHOD

Data were collected from independent variable (MLU) and independent variable (Syntactical Structure Complexity) crosssectionally. Spontaneous language sampling begin in November 2023 until Februari 2023. Ethical clearance was approved by Health Research Ethics Committee Poltekkes Kemenkes Surakarta. The number registration is LB.02.02/1/95/2023.

The population of research consists of 4-6 year children in Demakan Village. The sample comes from 4-6 year children with 30 children being the total sample. Spontaneous language sampling used to measure of all variables. MLU is average of utterance length. Calculation of MLU is the number of morphemes divided by the number of utterance. Total utterance of every children was 50 utterances. Syntactic complexity is one of spontaneous language sampling analysis results that measure of sentence used by children.

RESULTS

Klinik Belajar Bahasa Bicara is located in Sambilawang Rw 1, Demakan, Mojolaban, Sukoharjo, Central Java 57554. The clinic is an independent practical clinic providing Occupational Therapy and Speech Therapy services. For speech therapy service, the patient's age is varying between 2 and 10 years. The patients visit the clinic with varying problems including, among others, the language problem in 4-6 year age.

TK Desa Demakan 01 (Demakan 01 Kindergarten) is located in Jl. Indragiri No. 01, RT 1 RW 4 Pondok, Demakan, Mojolaban, Sukoharjo, Central Java 57554. This kindergarten has been established since May 1, 2002 with status of *TK Swasta* (private kindergarten). The kindergarten 4-6 year old students divided into two classes.

The respondents in this research are 30 children aged 4-6 years consisting of 10 children with language problem from Klinik Belajar Bahasa Bicara and 20 children without language problem from TK Desa Demakan 01. The number is based the ratio of children ages: 15 children aged 4 years, 9 children aged 5 years, and 6 children aged 6 years.

Descriptive analysis in this research is used to explain the characteristics of respondents including sex, condition, age, mean length utterance, and syntatic structure complexity.

Table 1. Respondents distribution

Variables	Frequency	Percentage %
Sex		
Boys	20	66.7
Girls	10	33.3
Condition		
Typical	20	66.7
Atypical	10	33.3
Age		
4	15	50
5	9	30
6	6	20
Total	30	100

Mean and Standar Deviation based on Gender

Table 2. Distribution of Mean and Standard Deviation for Boys and Girls

	MLU		SC	
	L	P	L	P
Mean	3.84	5.16	279.6	344.7
Std.dev	1.05	1.11	142.8	135.26
N	20	10	20	10

*MLU: Mean Length Utterance; SC: Syntactic Complexity

Source: Primary Data, 2022

From Table 2, it can be seen that boys have mean score of syntactic structure

complexity of 279.6 with standard deviation of 142.8 and MLU score of 3.84 with standard deviation of 1.05. Meanwhile, girls have mean score of syntatic structure complexity of 279.6 with standard deviation of 1.05. Meanwhile girls have mean score of syntatic structure complexity of 344.7 with standard deviation of 135.26 and MLU score of 5.16 with standard deviation of 1.11.

Mean and Standar Deviation based on Children Status

Table 3 Distribution of *Mean* and *Standard Deviation* by Condition

	MLU		SC	
	Atypical	Typical	Atypical	Typical
Mean	3.16	4.84	167.3	368.3
Std.dev	1.09	0.86	73.81	117.43
N		20	10	20

*MLU: Mean Length Utterance; SC: Syntactic Complexity
Source: Primary Data, 2022

From Table 3, it can be seen that children with language problem have mean score of syntactic structure complexity of 167.3 with standard deviation of 73.81, and MLU score of 3.16 with standard deviation of 1.09. Meanwhile the children without language problem have syntactic structure complexity score of 368.3 with standard deviation ot 117.43 and MLU score of 4.84 with standard deviation of 0.86.

Mean and Standar Deviation based on Age

Table 4 Distribution of *Mean* and *Standard Deviation* by age

Age	Atypical		Typical		
	L	P	L	P	N
4	5	5	4	1	15
5	3	3	3		9
6	3	1	2		6
N	11	9	9	1	30

Source: Data Primer, 2022

From Table 4, it can be seen that 4 boys aged 4 years, 3 boys aged 5 years, 2 boys aged 6 years, and 1 girl aged 4 years, have language problem. Meanwhile, 5 boys aged 4 years, 3 aged 5 years, 3 aged 6 years, 5 girls aged 4 years, 3 girls aged 5 years, and 1 girl aged 6 years have no language problem. In addition, girls tend to produce more long utterances despite belonging to the category of children with language problem.

Mean and Standar Deviation based on Gender and Children Status

Table 5. Distribution of *Mean* and *Standard Deviation* by Gender and Children Status

	MLU				SC			
	Typical		Atypical		Typical		Atypical	
	L	P	L	P	L	P	L	P
Mean	4.5	5.24	3.03	4.39	368.81	367.66	170.55	138
Std.dev	0.33	1.14	1.06		120.34	121.03	77.52	
N	11	9	9	1	11	9	9	1

*MLU: Mean Length Utterance; SC: Syntactic Complexity
Source: Primary Data, 2022

From Tabel 5. it can be seen that out of 30 children in Demakan Village, boys without language disorder have mean score of syntactic structure complexity of 368,81 with standard deviation of 120.34 and MLU score of 4.5 with standard deviation of 0.33. Girls without have mean score of syntactic structure complexity of 367.66 with standard deviation of 121.03 and MLU score of 5.24 with standard deviation of 1.14. Meanwhile, boys with language disorder have mean score of syntactic structure of 170.55 with standard deviation of 77.52 and MLU score of 3.03 with standard deviation of 1.06. Girls have mean score of syntactic structure complexity of 138 with MLU score of 4.39.

MLU and Syntactic Complexity Profiles

Table 6 *Maximum, Minimum, Mean,* and *Median*

	Maximum	*Minimum*	*Mean*	*Median*	*Std.dev*
Mean Length Utterance	7.32	1.20	4.28	4.41	1.22
Syntactic Complexity	534	119	301.3	282	ǀ41.47

Source: Primary Data, 2022

From Table 8, it can be seen that the 30 respondents have maximum mean length utterance (MLU) of 7.32, minimum MLU score of 1.20, mean of 4.28, median of 4.41, and standard deviation of 1.22. The maximum score of syntactic structure complexity of 534, minimum score of 119, mean score of 301.3, median of 282, and standard deviation of 141.47.

Relation Between MLU and Syntactic Complexity

Data analysis for the two variables with ratio scale that are not distributed normally is Spearman-Rank correlational test. The result of correlational test is explained in table.

Table 7. Relation between variables

		Coefficient of Correlation *(r)*	Significance *(ρ)*
Spearman Rank	Mean Length Utterance	0.644	0.000
	Complexity of Syntactic Structure		

Source: Primary Data, 2022

When ρ value < 0.05, the data shows that there is an effect between the two variables or alternative hypothesis (Ha) is supported. Meanwhile, when ρ > 0.05, the data shows that there is no effect between the two variables or alternative hypothesis is not supported. From the result of data analysis above, it can be found that ρ value is 0.000. ρ value = 0.000 is less than 0.05, meaning that there is an effect of *mean length utterance* (MLU) on the complexity of syntactic structure. The strength of effect between the two variables or r is indicated with number 0.644. This strength of correlation shows that there is a strong positive correlation.

DISCUSSION

The aim of this study is determine effect of MLU on syntac complexity. Considering this, the hypothesis to find out the effect between variables is Spearman-Rank test and ρ value of 0.000 (ρ<0.05) is obtained. It indicates that there is an effect between the variables and alternative hypothesis (Ha) is supported with the correlational coefficient of 0.644. Thus, it can be concluded that MLU and complexity of syntactic structure indicates that there is a strong one-way effect between the two variables, with positive r value. It means that the older the age, the higher will be the MLU score and the language development in syntactic aspect. MLU is mean length of speaker's utterance in morphem.

MLU is considered as the good measure of language complexity (Evans & Craig, 1992; Klatte et al., 2021, 2022; Owens & Pavelko, 2020; Pavelko et al., 2020; Pavelko & Owens, 2019; Ramos et al., 2022).The good language development is characterized with, among others, the more vocabularies the children have as they get older (Honig, 2007). The total number of words (TNW) also increases along with the age and is a common measure of verbal productivity, according to (Caravolas et al., 2012; McDuffie et al., 2005)

Children language development can be measured with sample analysis using MLU score. The result of estimated mean length of utterance shows MLU score constituting the quantity of children language development (Pratomo, 2022). Bigelow's (2012) argument that MLU is the mean number of morpheme uttered by a child; this measure is highly dependent on the length of utterance, determined by those who took sample and decided the classification of utterance. This mean score is achieved by ondisabled children at around 4 years of age, by MLU keeps increasing with the age (Shipley & McAfee, 2021). In lower MLU, new structure added into children's utterence increase the complexity of sentence. Following this development, the complexity growth largely results from the internal reorganization of utterance, rather than the addition of new structure. The explanation on this relationship between length and complexity is simplified and there are relevant factors (Owens & Pavelko, 2020). Mirsaleh et al., 2011; Owens & Pavelko, 2020; Potratz et al., (2022) confirming that there is a relationship between utterance length, MLU, age, and number of utterance. MLU and utterance will increase with children development and age.

The increase in utterance length can indicate the children language development, one of which is the development of children's syntatic ability. It is in line with Honig, (2007) confirming that age and vocabulary contribute significantly to MLU score, but vocabulary contributes more than age, indicating that the size of vocabulary provides better foundation to grammatical development. Grammatical aspect consists of syntax and morphology; thus, grammatical ability can indicate the development of morphological ability as characterized with the more morpheme used. The children's syntactical ability develops with age and approaches the complex ability as the adult has.

In this research, children were asked to describe a picture and as a result, the children will produce many utterances with complex more detailed structure if the children know the picture presented, were in a good mood, and do not feel shy. Thus, MLU score increases and syntax becomes more complex. It is in line with Pratomo, (2022) explaining that syntactic productivity and complexity of school-age children are highly affected by children's speaking ability. In addition, topic related to the experience they have enables the children to describe the picture better. The children were interested with the new picture they have seen and then posed some question vigorously.

Thus, the higher type of clause is used, the higher will be the mean length of utterance (MLU) and the morpheme used. As suggested by Ezeizabarrena & Fernandez, (2018), there is a correlation between expressive vocabularies and MLU score, in which the more varying the vocabularies of children, the more complex will be the structure of sentence the children produce. This research also compares children having no language problem with those having language problem. Children with language problem have less vocabularies so that the utterances produceda are sorter and do not have complex structure. It makes the scores of MLU and syntatic structure complexity lower than that of children without language problem.

Considering the discussion above, it can be concluded that there is an effect of MLU on the complexity of syntactic structure in 4-6 year children in Demakan Village. The older the children, the more vocabularies they will have that will increase their MLU score and make their syntactic structure more complex.

CONCLUSION

Considering the result of research and discussion, the following conclusions can be drawn the description of syntactic structure complexity for 30 (thirty) 4-6 years children in Demakan Village shows lowest score of 119, highest score of 534, mean of 301.2 and median of 282. The description of MLU ability for 30 (thirty) 4-6 years children in Demakan Village shows lowest score of 1.20, highest score of 7.2, mean of 4.28 and median of 4.41. The Spearman-Rank correlation shows p value of 0.000 ($p < 0.05$). It means that there is a correlation between *Mean Length Utterance (MLU)* and Syntactic Structure in 4-6 year children in Demakan Village. The *Correlation Coefficient* / r of 0.644 indicates moderate correlation strength and positive r value. It means that the

higher the MLU of a chid, the higher will be the children's complexity of syntactic structure. The future study should to measure the normative data of mean length utterance in the wider population.

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