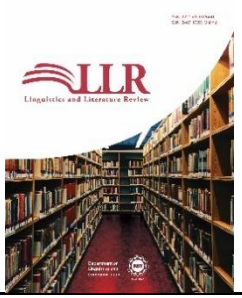
Linguistics and Literature Review (LLR)
Volume 8 Issue 2, Fall 2022
ISSN$_{(P)}$: 2221-6510 ISSN$_{(E)}$: 2409-109X
Homepage: http://journals.umt.edu.pk/llr/Home.aspx

Article QR



Title: **Convergent and Discriminant Validity of the English Prosodic Phonology Processing Test (EPPPT): A Multi-Trait Multimethod Approach**

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DOI: https://doi.org/10.32350/llr.82/03

History: Received: December 02, 2021, Revised: June 28, 2022, Accepted: June 30, 2022

Citation: Ayieko, G. (2022). Convergent and discriminant validity of the English Prosodic Phonology Processing Test (EPPPT): A multi-trait multimethod approach. *Linguistics and Literature Review*, *8*(2), 48-68. https://doi.org/10.32350/llr.82/03

Conflict of Interest: Author(s) declared no conflict of interest

A publication of
Department of Linguistics and Communications Institute of Liberal Arts
University of Management and Technology Lahore, Pakistan

Convergent and Discriminant Validity of the English Prosodic Phonology Processing Test (EPPPT): A Multi-Trait Multimethod Approach

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Abstract

Most of the prosody perception tests do not capture how listeners perceive and interpret stress, tone, and intonation in the process of listening comprehension. The current study developed the English Prosodic Phonology Processing Test (EPPPT). A sample of 240 Luo speaking high school students were tested using Confirmatory Factory Analysis (CFA) in a multi-trait multimethod matrix. Four traits were measured including word prosody, sentence prosody, juncture, and discourse prosody. Three methods were used including the picture selection task, stress assignment task, and chunking task. CFA confirmed the current taxonomy of the diverse traits of English prosodic phonology: word stress, sentence stress, open and closed junctures, and discourse. The methods yielded statistically significant differences among the discriminant validity of these traits. The model fit was better when the different prosodic traits were specified (convergent validity), while the methods of testing yielded distinguishable, unique types of information about prosodic phonology processing. Using a battery of five tests, the results of EPPPT showed that the traits are quite independent of each other and the method effect is not significant.

Keywords: reliability, validity, EPPPT, Prosody, MTMM

Introduction

Prosody is composed of the following units: mora, syllable, feet, intermediate group, intonation group, sentences and paragraphs, as well as four phenomena namely stress, pitch, intonation or phrasing, and rhythm. The role of prosody has been ignored at the expense of segmental phonology in the fields of second/foreign language perception and clinical linguistics (Richards & Schmidt, 2013). Prosody is defined as the general

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term for variations in the loudness, pitch, and rhythm of speech that affect the sequences of syllables (Heuven, 1994; Meister et al., 2008; Richards & Schmidt, 2013; Prieto & Paolo, 2018). Theodoropulos (2014) stated that prosody deals with aspects of pronunciation that include sound duration, amplitude, and sequence of frequencies of an utterance.

Crystal (2008) stated that the term prosody in phonetics and phonology is used with reference to the features of speech that spread across more than one phoneme, such as pitch, stress, and juncture. Trask (2005) defined prosody from three different perspectives. These included i) the investigation of pitch variation, stress, tone, and intonation, ii) phonological processes which are realized phonetically on more than one segment, such as lip-rounding, backness, and nasalization, and iii) the domain of a phonological element which is longer than a single segment, such as stress and tone. Wagner and Watson (2010) concluded that any change in the acoustic-phonetic properties of an intonational phrase or prosodic word has no relation with lexical items. Prosody comprises a hierarchy of features that includes word stress, phrase and sentence stress, intonation, phrasing, prominence, juncture, and rhythm. Wermke et al. (2021) stated that "Prosody lays an important foundation for language acquisition." There is, however, no unified and standardized perception test available for English prosody acquired in the context of English as a second language. The problem of operationalizing and measuring the constructs of English prosody arises because the latter comprises a multi-factorial matrix consisting of word stress, sentence intonation, and timing. It operates at the level of word, phrase, sentence, and discourse-focused intonation and phrasing.

The following are some tests used to measure prosody in children: Crystal (1982) profiled children's prosody using the Prosody Profile (PROP), Shriberg et al. (1990) profiled prosody using Prosody Voice Screening Profile (PVSP), Nowick and Duke (1994) used Diagnostics Analysis of Nonverbal Accuracy 2 (DANVA 2), Peppé and McCann (2003) devised Profiling Elements of Prosody in Speech Communication (PEPS-C), Klieve (1998) and Klieve and Jeanes (2001) made use of Perception of Prosody Assessment Tool (PPAT), and Lai et al. (1991) used Minnesota Test of Affective Prosody (MNTAP). These tests gloss over prosody and its multifaceted nature. They are rather atomistic in

nature. Pennington (1987) argued that pronunciation should be conceptualised as a non-segmental and non-discrete unitary whole.

English Prosodic Phonology Processing Test (EPPPT) is a battery of test developed by Otieno (2013) to test the processing of English prosodic phonology of Luo speakers. EPPPT integrates different aspects of English prosody taking into account its multidimensional and transitory nature. The processing of prosodic phonology is operationally tested using different tasks types with different graduated levels of difficulty.

The predictive validity of task types was tested in relation to the various English prosodic constructs and their perceptual difference by the speakers of the four Luo languages, namely Dhoacholi, Dhopadhola, Dholango, and Dholuo. Otieno (2013) used six different tests viz Lexical Ambiguity Test (LAT), Stress Preference Perception Test (SPPT), Discrimination Test (DT), Picture Selection Test (PST), Chunking Test (CT), and Multiple Choice Test (MCT). Each one of these five tests has five subsections dealing with primary word stress, secondary word stress, unstressed syllable, and juncture. Sentence intonation deals with features associated with a whole syllable, word, or phrase. These include tonic stress (which marks the most prominent syllable in the word) and intonation phrase. Emphatic stress occurs when stress is shifted from the principal noun to another content word in the intonation phrase. Contrastive stress highlights the difference that exists between one object in the intonation phrase and another. The rationale for conducting multiple sets of tests on the same prosodic category is to enable the researcher to disentangle the effect that these different categories have on perception.

The construct validity and reliability of EPPPT were assessed using the Multi-trait Multimethod Matrix design (MTMM) devised by Campbell and Friske (1959). There is no objective and standardized measure for testing prosody and the construct 'prosody' has to be defined operationally using 'construct validity'. The concept 'construct validity' ensures that the method matches the construct and it includes content validity, predictive validity, face validity, concurrent validity, convergent validity, and discriminant validity. Campbell and Friske (1959) operationally defined the Multi-trait Multimethod matrix or MTMM as a correlation of indices predicated on the assumption that all the scores of the same trait should hypothetically have a high positive correlation. On the other hand, there

should hypothetically be a low correlation between unrelated scores of different constructs.

Campbell and Friske (1959) defined convergent validity as "the extent to which traits that should be related theoretically are interrelated in reality." Secondly, discriminant validity is in fact the degree to which unrelated traits are not interrelated in reality. The current paper applied Confirmatory Factor Analysis (CFA) model to MTMM to simplify and enable the discriminant and convergent validity of EPPPT.

The main goal of the current study was to estimate the discriminant and convergent validity of the prosodic phonology traits of EPPPT and the effect of the testing method that uses CFA in MTMM. Four constructs in English prosodic phonology namely word stress, sentence stress, juncture, and discourse stress were operationalized as four traits in this study namely word prosody, sentence prosody, juncture, and discourse prosody. Each trait was tested using three different methods including Picture Selection Task (PST), Stress Assignment Task (SAT), and Chunking Task (CT).

Dumenci (2000) pointed out that CFA-MTMM is widely used because of the following three reasons: (i) the model separates its different traits, methods, and unique components; (ii) the model evaluates convergent and discriminant validity and their effect using statistical hypothesis testing strategies; and (iii) the model uses *t* to estimate within-trait and within-method correlations after accounting for unreliability measures. The CFA model decomposes MTMM matrix into the following three additive components:

i) *t* represents the common trait factors explained through correlations across different methods,

ii) *m* represents the common method factors individually explained by correlations across separate traits,

iii) tm represents the unique variance which is the unexplained variable specific variance within the EPPPT.

The CFA model tested the following null hypotheses:

H_1: There is no statistically significant difference between the three methods used namely the (i) Picture Selection Task or PST, (ii) Stress Assignment Task or SAT, and (iii) Chunking Task or CT.

H_2: There is no statistically significant difference between Model 1 and Model 2 keeping in view the EPPPT scores of the Luo learners of English.

H_3: There is no statistically significant difference between Model 1 and Model 3 (traits) keeping in view the EPPPT scores of the Luo learners of English.

H_4: There is no statistically significant difference between Model 1 and Model 4 (methods) keeping in view the EPPPT scores of the Luo learners of English.

Methodology

Research Design

The current study adopted the Solomon four-group research design Gay et al. (2012). CFA was used to test whether the prosodic traits specified in EPPPT have convergent and divergent validity in MTMM. The 2 X 2 factorial design randomly assigned the speakers into any one of the four groups examined with different pre-tests and treatments. At the end of the experiment, all the groups received a post-test according to the methodology of Creswell (2014).

Location

The present study was conducted in four locations viz: Gulu and Lira Districts in Northern Uganda, Tororo District in Eastern Uganda and Homa-bay County in Nyanza Region, Kenya.

Population and Sampling Method

Five secondary schools were selected rather than individual learners.

Research Population

The research population comprised three Luo speaking students in Kenya and three senior Luo speaking students in Uganda. Luo-speaking students studying in form three at the O' level in girls secondary school A Gulu and a mixed secondary school B Gulu in Gulu district (Dhoacholi), secondary school C Lira in Lira district (Dholang'o), and School D in Tororo district (Dhopahola) Uganda and secondary school E in Homa-bay County (Dholuo) Nyanza Region, Kenya comprised the population of the study.

Sample and Sampling Technique

A sample of 240 Luo speakers was selected using stratified random sampling. Random assignment was used to place the students in each school into two groups: experimental and control. Information regarding sample characteristics according to the school and language of the subjects is summarized in Table 1 below:

Table 1

Demography of Subjects by School

	School A Gulu Dhoacholi	School B Gulu Dhoacholi	School C Lira Dholang'o	School D Tororo Dhopadhola	School E Homa-Bay Dholuo	Total
Male	-	17	60	36	22	
Female	30	13	-	24	28	
Total	30	30	60	60	60	240

Criteria for Inclusion (of Respondents)

The current study used a specific inclusion criteria to enable the researchers to select the right respondents. This criteria was based on the biographical characteristics of the respondents, such as the language they speak at home, the language they speak with their parents, and the language they speak outside their home and in their school (among other sociolinguistic variables). These characteristics were used to determine who was included or excluded.

Data Collection

Recording the English Prosodic Phonology Processing Test (EPPPT)

"The present researcher developed English Prosodic Phonology Processing Test (EPPPT) after reviewing the existing literature on phonological processing in English" (Otieno, 2013). A pilot test was administered to test the validity and reliability of EPPPT. Listening comprehension test recording was made using the voice of an English speaker marked by Received Pronunciation (RP) at the Voice of Hope Radio Studio, Kigali, Rwanda in June 2008.

Description of EPPPT

The entire EPPPT test batter consisted of five separate tests. Each test had five sub-tests that dealt with different aspects, such as word stress (both primary and secondary) and sentence stress, realized through pitch accent and juncture, respectively. While, discourse stress was realized through pitch accent variation. All of these represent the four traits in this study namely word prosody, sentence prosody, juncture, and discourse prosody. Each trait was tested using three different methods namely Picture Selection Task (PST), Stress Assignment Task (SAT), and Chunking Task (CT). Table 2 below summarises the above information.

Table 2

Prosody Traits and Methods in EPPPT

	Test 1	Test 2	Test 3	Test 4	Test 5
Sub test 1	1. Word stress perception test (trait) 2. SAT (method)	1. Word stress perception test (trait) 2. SAT (method)	1. Word stress perception test 2. CT (method)	1. Syllable division 2. CT (method)	1.Word stress perceptio n test 2. SAT (method)
Sub test 2	1. Juncture and prosody trait) 2. CT (method)	1. Word segmentation and stress perception 2. SAT (method)	1.Syntactic ambiguity 2. PST (method)	1. Stress placement 2. SAT (method)	1. Primary stress perceptio n 2. CT (method)
Sub test 3	1. Pitch accent detection test 2. CT (method)	1. Pitch accent detection test 2. PST (method)	1. Pitch accent detection test 2. SAT (method)	1. Pitch accent detection test 2. CT (method)	1. Pitch accent detection test 2. PST (method)
Sub test 4	1. Pitch accent detection test 2. ST (method)	1.Discrimina-tion task 2. CT (method)	1. Pitch accent detection test 2. PST (method)	1. Pitch accent detection test 2. SAT (method)	1. Pitch accent detection test 2. CT (method)
Sub test 5	1. Pitch accent	1. Picture Selection	1. Pitch accent	1. Pitch accent	1. Pitch accent

detection test 2. PST (method)	Test 2. CT (method)	detection test 2. CT(method)	detection test 2. SAT (method)	detection test 2. PST (method)

Source: Otieno (2013)

Administration of the Test

Three steps were followed in the administration of EPPPT namely pre-test, training, and post-test. The entire training cycle took a three-week period per school.

Pre-test Phase. At the beginning of the current study, the researcher taught both groups briefly the aspects of English prosodic phonology. The experimental group was taught and sensitized on word stress, word juncture, sentence intonation, and discourse prosody. Different tasks that constituted the said tests were also introduced at this stage.

Training Phase. The experimental group was taught extensively different aspects of English prosody using the Gilbert's (2008) Prosody Oriented Approach (POA) for three weeks. On the other hand, the researcher taught the control group using the regular approaches prescribed in the syllabus. At the end of the treatment session, the selected instrument (EPPPT) was administered to both groups.

Validity and Reliability of EPPPT

EPPPT was pilot tested in Arambe Secondary in 2008. The reliability coefficient was calculated through Pearson correlation, which was established to be 0.70 at α 0.01 and found sufficient according to the criteria of (Koul, 1984; Gall et al., 1996).

Data Analysis

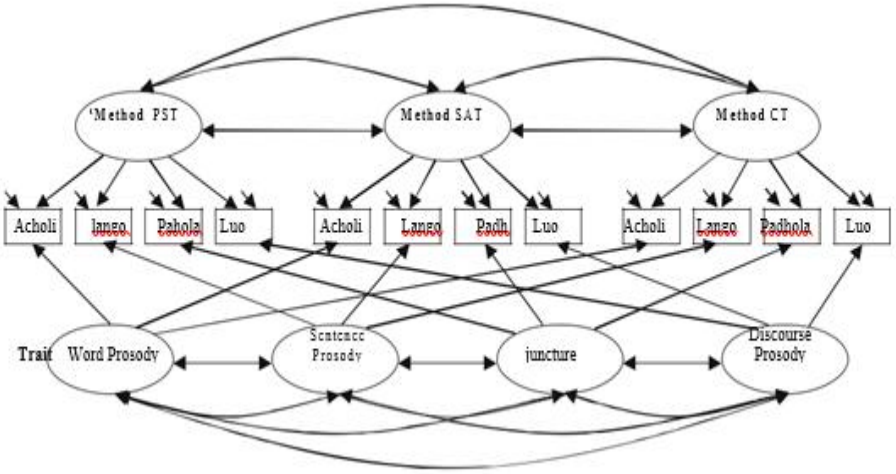
The CFA-MTMM approach was adopted in the current study which is the Correlated Traits/Correlated Methods Model (CTCM). The English Prosodic Phonology Processing Test (EPPPT) has sub tests to determine the four prosodic traits namely word stress, word juncture, sentence intonation, and pitch accent variation in discourse prosody.

The current study applied the Confirmatory Factor Analysis (CFA) approach to MTMM for construct validation of the four English language prosodic constructs, namely word stress, phrase and sentence stress,

juncture, and discourse prosody. The two main types of validity hypothesised in the current model are convergent and discriminant validity. The former deals with two measures that hypothetically measure the same construct, while the latter deals with two measures that are not supposed to be related, hypothetically.

Figure 1

The Hypothesized MTMM using General CFA Model



Note. Four prosodic traits: word prosody, sentence prosody, juncture and discourse prosody. Four different methods: Picture Selection Task (PST), Multiple Choice Task (MCT), Stress Assignment Task (SAT) and chunking task (CT).

The current paper applied CFA on the MTMM of EPPPT Luo speakers' response data in Fig.1. The models' overall fit was tested and compared to each other. The trait factors included word prosody, sentence intonation, and pitch accent variation for discourse prosody, while method factors included Picture Selection Test (PST), Stress Assignment Test (SAT), and Chunking Test (CT) as factored in the model.

The current paper followed the five steps proposed by Byrne (2012). The first step is to test the first model which provides the hypothesized baseline that allows the researcher(s) to compare between the three alternatives available in CFA. The second step is to test the hypothesis that correlated methods which are operationalized as No traits / or Correlated

methods (NTCM) in the model correlate. The third step is to test the hypothesis that determines if there is a perfect correlation in the Perfectly Correlated Traits/Freely Correlated Methods Matrix (PCTCM). The fourth step is to test the hypothesis of the specification of the Correlated Traits/Uncorrelated Methods (CTUM) in the model. The final step evaluates the construct validity of the MTMM model. This starts with testing the goodness-of-fit of the four MTMM models and assumes that the fit is acceptable. Convergent validity was estimated by comparing the CTCM model with the NTCM model. Discriminant validity was estimated by comparing both traits and methods.

CFA was applied on each of the three method factor structures on the two data sets generated by experimental and control groups to test each model's goodness-of-fit. In step 1, the first model which provides the hypothesized baseline that allows the researcher(s) to compare between the three alternatives in CFA was tested — in this case that factor is primary word stress. The other two stress patterns namely secondary stress and non-stressed syllable were found to be non-significant factor loadings. The second step is to hypothesize the correlated methods specified as no traits/correlated methods (NTCM) which provided Model 2 which includes the correlated methods and had a correlated three-factor model with five sub tests of each EPPPT loading on the perception factor. The third step provided Model 3 which correlates the traits while allowing the methods to correlate freely. The last step is model 4, tests correlation between trait factors and method factors which is the Correlated Traits/Uncorrelated Methods (CTUM). The first two models, namely Model 1 and Model 2, assess the convergent validity of EPPPT. The discriminant validity of EPPPT, on the other hand, is where different traits are measured by the same method, hypothetically these should be the lowest.

Results

The correlation matrix of all the traits and methods used in the MTMM model is summarised in Table 3 below. Students' response to the four English prosodic traits viz word prosody, sentence prosody, juncture, and discourse prosody were tested using three methods namely Picture Selection Task (PST), Stress Assignment Task (SAT), and Chunking Task (CT).

There are three basic types of information with critical bearings for the current study viz: Discriminant validity tests the correlation between

Trait		Method 1			Method 2			Method 3		
		$X_1$1	$X_2$2	$X_3$1	$X_1$2	$X_2$3	$X_3$2	$X_1$3	$X_2$3	$X_3$3
Method 1	$X_1$1	(0.91)								
	$X_2$2	0.42	(0.82)							
	$X_3$3	0.21	0.22	(0.86)						
Method 2	$X_1$2	*0.67*	0.42	0.21	(0.90)					
	$X_2$2	0.32	*0.67*	0.23	0.28	(0.91)				
	$X_3$2	0.12	0.11	*0.54*	0.31	0.56	(0.88)			
Method 3	$X_1$3	*0.62*	0.25	0.23	*0.71*	0.42	0.32	(0.81)		
	$X_2$3	0.24	*0.60*	0.14	0.42	*0.70*	0.32	0.62	(0.92)	
	$X_3$3	0.21	0.14	*0.61*	0.32	0.30	*0.72*	0.61	0.60	(0.89)

different traits measured by the same method. Hypothetically, the lowest ($X_3$3 .$X_1$1 =0.21, X33.$X_2$2 =0.14) are represented by the gray boxes in Table 3.

Table 3

MTMM Matrix for the Three Traits and Three Methods of EPPPT

Note. Trait: $X_1$1 represents word stress, $X_2$1 represents juncture, $X_3$1 represents nuclear pitch variation. Method 1 represents Picture Selection Test (PST). Method 2 represents Stress Assignment Test (SAT). Methods 3 represents Chunking Test (CT).

Convergent validity tests the correlation between the same traits measured by different methods. It is also known as diagonal validity. It is represented by the bold italic figures in the matrix (e.g. $X_1$2. $X_1$1= 0.67) (See Table 3). Reliability coefficient for each test is indicated in parenthesis. These coefficients reveal a high level of reliability that ranges from 0.82 - 0.92. It shows that the tests were reliable (See Table 3).

The fifth stage of the model as outlined in Kyriazos (2018) is as follows:

i) Test the goodness-of-fit model of the four MTMM models with data from EPPPT and the assumptions that are applicable to the fit.

ii) Test the convergent validity index at the matrix level of the data from EPPPT scores by Luo learners of English.

iii) Test the discriminant validity index at the matrix level of the data from the EPPT scores by Luo learners of English.

The sixth step is to evaluate the construct validity index at the parameter level of the different aspects of English, as perceived by the Luo learners of English.

The first step is to test the data for goodness-of-fit as summarized in Table 4 below.

Table 4

Chi-square Goodness of Model Fit Test Indices for MTMM of EPPPT

Model	χ^2	*df*	CFI	NFI
1. Correlated traits, Correlated methods	23.42	139	.96	.95
2. No traits, correlated methods	301.51	139	.56	.45
3. Perfectly correlated traits, freely correlated methods	68.30	139	.95	.97
4. Correlated traits, uncorrelated methods	41.73	139	.96	.97

Note. CFI = Comparative Fit Index, NFI = Normed Fit Index.

The chi-square test of the goodness-of-fit indices is the extent of normally distributed data in the model, consisting of the Luo learners' responses to EPPPT in the MTMM model, as summarised in Table 4 above. The current paper is guided by the criteria given in Hu and Bentler (1999) and Hooper et al. (2008), which states that a CFI value > 0.95 is acceptable. They noted that since CFI is scaled between 0 and 1, the higher value indicates a good fit for the model. The NFI, on the other hand, assesses data fit relative to a baseline model — Model 1, which is based on the assumption that there is no covariance between the observed variables. Hence, $H_0$1 which states that there is no statically significant difference between the three methods used namely Picture Selection Task-PST, Stress Assignment Task-SAT, and Chunking Task-CT is rejected.

Table 5

Differential Goodness-of-Fit Indices for MTMM Nested Model Comparisons

Model Comparisons	$\Delta\chi 2$	Δdf	*p*	ΔCFI	ΔNFI

Convergent Validity (EPPPT)					
Model 1 vs. Model 2 (traits)	201.81	239	.05	.41	.40
Discriminant Validity (EPPPT)					
Model 1 vs. Model 3 (traits)	60.07	239	.05	.07	.07
Model 1 vs. Model 4 (Methods)	24.42	239	.05	.02	.02

Note. CFI = Comparative Fit Index, NFI = Normed Fit Index.

The critical factor in the current model for testing the convergent and discriminant validity is the comparison of the goodness-of-fit indices between the models summarised in the above Table 5. The chi-square goodness-of-fit is a right tailed test that was used to compare the occurrence of English prosodic phonology constructs (traits) and their hypothesised relations. The second hypothesis was rejected since the results in Table 5 indicate that there is a statistically significant difference between the traits ($\Delta\chi^2$ (239) = 201.81, p <0.05).

This shows that the traits are actually sufficiently different and MTMM has convergent validity in the testing of the perception of English phonological processing. Model 1 shows traits that improve the general model for step 2. The second step was to test the discriminant validity of EPPPT by comparing Model 1 and Model 3. Table 5 shows a significant difference between Model 1 and Model 3 which reveals that there is discriminant validity of the different prosodic traits that were measured by the EPPPT traits ($\Delta\chi2$ (239) = 60.07, p <0.05). The third and final step tested discriminant validity by comparing Model 1 with Model 4 for the different methods used in the test. Table 5 shows that there is a statistically significant difference between Model 1 and Model 4, showing that there is discriminant validity of different methods measured by the EPPPT traits ($\Delta\chi2$ (239) = 24.42, p <0.05). Hence, H_{04} was rejected. The models also distinguished between the different methods.

Discussion

The current paper examined convergent and discriminant validity using CFA-MTMM of EPPPT that tests the perceptions of English prosodic phonology by Luo speakers. There are four constructs of English prosodic phonology that were tested using three different methods, namely the Picture Selection Task (PST), Stress Assignment Task (SAT), and

Chunking Task (CT). It remains the first study that applied the MTMM approach to assess the perception of second language prosody. The MTMM matrix found a higher correlation between the same traits and the same methods than between different traits assessed by the same methods. It was found that the same prosodic traits were not significantly correlated with other different prosodic traits.

This paper is unlike the previous studies on English word stress which were mostly based on a single method of production and perception of English primary word stress (Archibald, 1993; Keating, 2006; Aungcharoen, 2006; Bourjan, 2003; Hahn, 2004; Lui, 2017). In a a second set of studies, Yu and Andruski (2010) and Yu (2021) used two different tasks (methods) namely identification and discrimination, while Wayland et al. (2006) used production and judgement tasks. There has been no attempt as yet to disentangle the effect of the method in the perception of word stress by second language learners, to which the current study contributes.

Juncture in speech is the relationship between a phoneme and its preceding and succeeding phonemes. The word boundary has a number of allophonic variations and contrast. Different traits and methods were used to test the perception of juncture in the auditory stimuli. Gramley and Patzold (1992) defined juncture as a type of supra-segmental area which has most to do with segmental phonemes. Crystal (2003) pointed out that the most obvious realization of a junctural feature is pause or silence. Roach (2009) further distinguished three types of junctures viz close juncture, internal open juncture, and external open juncture. There are ten phonetic cues of juncture manipulated in the current study namely vowel lengthening, consonant lengthening, aspiration, vowel shortening, strengthening, devoicing, glotallization, dark /l/, contrastive stress, and rhythmic groups (Bloomfield & Newmark, 1965; Hoard, 1966; Jones, 1966; Brosnahan & Malmberg, 1975; Chung, 1983; Ladefoged, 1993; Gimson, 1994; Mattys & Clark, 2002; Dilley & McAuley, 2008).

The current study adopted a listener oriented approach based on the assumption that fundamental frequency Fo contours should be operationally defined in terms of a number of perceptually relevant Fo patterns (Cohen & Hart, 1967; Collier & Cohen, 1990). The results showed that the perceptual results of sentence prosody reflect the method effect as well as the trait effect. This finding builds on the preceding

studies such as Atoye (2005) that examined intonation perception and interpretation by Nigerian non-native learners of English. These previous studies, however, did not employ the MTMM approach, nor did not delve into the issue of traits and methods contribution.

Previous studies conducted on discourse intonation highlighted the fact there are regular, logical variations among the different forms and functions of intonation in discourse. There are also different structural and functional loads that differentiate isolated phrases and sentences from larger discourses. The EPPPT intonation model is based on the analytical framework given by Chun (2002) that focuses and manipulates the following three aspects of discourse. The first aspect is sentence stress where the placement of nuclear tone is manipulated. The second aspect is the direction of pitch change and terminal contour. The third aspect is the key which is the pitch range at transition points in the discourse. Chun (2002) added that the phonetic cues employed by the RP speakers of English to demarcate structure at sentence level focus where pitch range and movement are significant. The speaker focuses on a constituent using the pitch height of the syllable. The current study tested the perception and interpretation of pitch movement and pitch range by Luo speakers using different traits of prosody (intonation) namely pitch movement, pitch range, and pitch height, as well as different methods viz SAT, PST, and CT. The results showed that there was both a task effect and a trait effect which indicated that the same trait can yield different scores depending on the method applied to measure the discourse prosody.

Conclusion

The validity and reliability of EPPP for measuring English language prosody and its learnability was established by the current research. Confirmatory Factory Analysis (CFA) in the Multi-trait Multimethod (MTMM) matrix was used to assess the following: 1) Reliability using the diagonal in the MTMM matrix which depicts the relationship between the same traits (constructs) and the same methods of measurement. EPPPT was established to be a reliable instrument for measuring prosody perception. 2) Convergent validity which depicts the relationship between the same traits (constructs) measured by different methods. It was established that EPPPT has convergent validity. 3) Discriminant validity establishes the correlation between different traits measured using different methods. EPPPT was shown to have discriminant validity. The

application of the instrument can, therefore, be replicated with the speakers of other languages to increase its generalizability.

Acknowledgment

I would like to acknowledge the late Professor Livingstone Walusimbi and Dr. John Kalema who supervised this work as part of the Ph.D. thesis at Makerere University, Kampala, Uganda.

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