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Examining EFL Learners' Formulaic Competence and Factors Affecting Formulaic Sequences' Learnability

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ABSTRACT

This study investigated EFL learners' formulaic competence achievements, and the extent to which the factors of non-compositionality, mutual information, socio-cultural specificity and frequency in formulaic sequences predict receptive-productive formulaic knowledge. Underrepresentation of formulaic competence construct in the existing phraseological measures motivated us to develop a receptive-productive test battery adapting Kecskes'(2007) formulaic language model. The battery was conducted on 63 upper-intermediate Iranian adult EFL learners from three different instructional settings. The majority of participants showed an underdeveloped competence. Particularly they demonstrated poor productive knowledge in writing an argumentative essay, as documented by repeated measures ANAOV and formulaic-language error-analysis. There was also a significant variation in their mastery of different types of formulaic sequences. To explain this variation, we designed a tri-dimensional cline of formulaicity on which the target formulaic sequences could be located on the basis of their quantitatively evaluated variables of formulaicity. Regression analysis revealed that non-compositionality and frequency factors in formulaic sequences affect their learnability more than mutual information and socio-cultural specificity do, which means that semantic opacity and conventionality in formulaic sequences influence their mastery more than fixity and pragmatic idiomaticity. The findings suggest an interplay between psycholinguistic reality of formulaic sequences (i.e. automaticity aspect) and their linguistic and socio-cultural realities, which offers pedagogical implications for EFL classes .

Keywords: *Formulaic Competence, Learnability, Conventionality, Non-Compositionality, Fixity*

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1. Introduction

With the decline in the dominance of generative grammar, the pendulum of interest in L2 research has swung back from language creativity to language formulaicity, and formulaic language has been recognized as an important factor in second language acquisition (Nattinger & DeCarrico, 1992; Wray, 2002; Wray & Perkins, 2000). Correspondingly, formulaic competence (phraseological or collocational competence, in its traditional sense) has also received recognition as one main communicative sub-competence in ELT domain. In her latest revised model of communicative competence, Celce Murcia (2007) recognizes formulaic competence as a distinctive sub-competence of communicative competence and emphasizes the importance of learners' knowledge of formulaic sequences (FSs) as 'building blocks' of communicative competence. As a set of 'continuous or discontinuous' phrases, FSs are generally regarded as fully or partially prefabricated, conventionalized chunks of language, which are "stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar" (Wray, 2002, p.9). The multifaceted nature of formulaicity has resulted in a huge diversity in FSs' types, which "have been studied under many rubrics, including lexical phrases, formulas, routines, fixed expressions, and pre-fabricated patterns" (Biber & Barbieri, 2007, p. 264).

One main outcome of the growing interest in language formulaicity is that

acquiring a native-like formulaicity in L2 is a stumbling block for most language learners (*see Bishop, 2004*; Wray, 2002). This difficulty seems to be arising primarily from their restricted exchangeability or substitutability in forms, frequency in language use as well as semantic and pragmatic opacity in meanings and functions, respectively (see Howarth, 1998; Nesselhauf, 2003). In other words, FSs' formulaicity features seem to be impacting their learnability. According to Henriksen (2013), however, the outcome of research attending to this issue has been mostly tentative explanations without sufficient empirical evidence. Nguyen and Webb (2017), accordingly, contend that still little is known about the relationship between formulaic language mastery and defining features of formulaicity in FSs.

Thus, the present research intends to examine formulaic competence in order to cast more light on the issue of formulaic language learning in instructed L2 settings, which to date, has remained a 'phraseological elephant in the room of pedagogy' (Martiniz, 2011). In this regard, further attempts are required for a multi-dimensional measurement of EFL learner' formulaic competence (Gałkowski, 2011), so that the instruction and evaluation of language formulaicity could be facilitated in ELT domain. With these accounts, in this study, receptive-productive measures would be developed and administered to assess the level of formulaic competence. In addition, a novel cline (three-dimensional continua) of formulaicity would be implemented to determine what formulaicity variables render learning FSs difficult for EFL learners.

2. Review of Literature

Although the issue of formulaic competence measurement has long been attended to in phraseology research (see Bestgen & Granger, 2014; Henriksen, 2013), the dominant trend has been reductionist in nature inasmuch as the central attention has been on measuring knowledge of idioms and collocations (e.g., Eyckmans, 2009; Gyllstad, 2007; Jaén, 2007; Laufer & Waldman, 2011). Although these studies have been of important contributions to formulaic language research, most of their developed measures have suffered validity issues of construct underrepresentation and item selection.

Firstly, the domain targeted in most phraseological studies has been primarily receptive and few have attended to L2 learners' productive formulaic knowledge. Any valid measurement of the construct needs to take into account not only the existing diversity in FSs' forms and functions but also the internal automaticity (i.e. FSs' storage and accessibility in lexicon). But as Cordier (٢٠١٣) contends, a reliable documentation and of FS holistic storage psycholinguistic operationalization of FSs is not feasible, for there is no direct access to language users' internal linguistic representation of FSs. Hence, the methodological difficulty of operationalizing formulaic competence as a multifaceted construct has compelled many studies to make a compromise in their focus and restrict their scope predominantly to linguistic domain. For instance, Martinez (2011) in developing a Phrasal Vocabulary Size Test (PVST) from a list of frequency-informed and pedagogically-relevant multiword sequences in L2 instruction does not attend to all the underlying competence constructs—it measures only learners' receptive knowledge of FSs' meanings and does not probe learners' ability to retrieve and use FSs in productive situations (i.e. the automaticity aspect of the processing sub-competence). Moreover, she does not entirely target the lexico-grammatical and socio-cultural sub-competences, as no particular set of grammar-bound and culture-bound FSs have been designated to account for varying degrees of non-compositionality, lexico-syntactic fixedness, and culture-specific conventionality.

Secondly, the item selection criteria in earlier studies have not been of clear methodological justifications (see Nguyen & Webb, 2017). For instance, in developing a 50-item multiple-choice collocation test for Iranian EFL learners, Keshavarz and Salim (2007) did not justify their criteria for selecting target sequences (30 verb + noun items as lexical collocations and 30 grammatical collocations) and related distractors. In creating a corpus-driven receptive test, however, Jaén (2007) set the criteria of language-use contextual diversity, semantic transparency and restricted exchangeability for selecting target verb-noun and adjective-noun collocations. But in implementing the criteria, the author relied on intuition and frequency factor in item selection and did not use statistically objective criteria to justify his subjective sampling. Meanwhile, in designing their collocation tests, Eyckmans (2009) and

Gyllstad (2007) used a more systematic sampling procedure because the author used corpus statistical measurement indices (frequency and z-scores) to sample target collocations. Nonetheless, Eyckmans (2009) did not take into account the existing flexibility in collocational FSs' forms and employed the criterion of restricted substitutability to distinguish fixed collocations from flexible ones (i.e. free word combinations). Likewise, despite having some predetermined criteria, Gyllstad (2007) had to rely on intuition in selecting the target and distractor items for the receptive tests of collocations (i.e. Collex & Collmatch), which jeopardized item representativeness in their measures. It should be noted that even the studies that have obtained an extended measurement scope to tap into L2 learners' productive formulaic knowledge show some pitfalls (e.g., González Fernández & Schmitt, 2015; Jaén, 2007; Schmitt, Dörnyei, Adolphs & Durow, 2004). For instance, in an attempt to measure ESL learners' automatic accessibility to collocations under controlled situations, Jaén (2007) opted for gap-filling technique to prompt learners supply the adjective components of the contextualized collocations. Likewise, using lexical priming technique, Schmitt et al. (2004) blended elements of cloze and C-test techniques in their productive formulaic knowledge measure, whereby learners would be prompted to predict the tail of FSs' constituents in a contextualized text. One criticism that could be levelled against Jaén and Schmitt et al.'s measures is that learners' ability to predict and retrieve FSs under controlled situations could not warrantee that in free productive situations without any lexical priming, they would be able to access FSs automatically as holistic chunks. A bird's eye view of the following L2 literature augments this line of reasoning

2.1 L2 Learners' Formulaic Knowledge and Factors Affecting it

Substantial L2 literature indicates that acquiring a native-like formulaic competence is difficult for L2 learners as their findings demonstrate that learners' produced language is rife with underuse, overuse, and misuse of some formulaic phrases (see Alali & Schmitt, 2012; Howarth, 1998; Gyllstad, 2007; Laufer & Waldman, 2011; Nesselhauf, 2003; Paquot & Granger, 2012). As a direct consequence of such rampant difficulties in using FSs, most learners' produced language, despite being grammatically acceptable, typically sounds unnatural and strange (Granger, ۱۹۹۸; see also Pawley & Syder, 1983).

The difficult nature of formulaic language acquisition has spurred some research to explain why even 'advanced' L2 learners eventually fail to develop a native formulaic competence, and some empirical evidence, though with mixed results, has emerged in L2 literature:

- semantic transparency positively affects learnability of collocational items (Nesselhauf, 2003, Wolter & Gyllstad, 2011; Yamashita & Jiang, 2010)
- restricted exchangeability in FSs forms functions as the main detrimental factor in their learnability (Cowie, ۱۹۹۸) but fixity of idioms functions as a positive factor of learnability (Howarth, 1998)
- FSs' low perceptual saliency in FSs negatively affects their noticeability and eventual learnability (Foster, 2001; Henriksen, 2013; Martinez & Murphy, 2011; Wray, 2008; Ying & O'Neill, 2009)
- FSs' frequency in language use (i.e. conventionality) act as an overriding factor in their learnability (Conklin & Schmitt, 2012; Durrant & Schmitt, 2010; Ellis, Simpson-Vlach & Maynard, 2008)
- MI score, node word (or key word) frequency and congruency (word for word overlap in L1–L2 form–meaning connection) in collocational sequences overtime have more impact on their learnability than the collocation frequency (Nguyen & Webb, 2017)
- socio-cultural load and pragmatic idiomaticity, associated with FSs' functions, influence FSs' learnability (Dörnyei, Durow & Zahran, 2004; Kuiper, 2004; Liu, 2014)

The studies reviewed suggests that difficulty in mastering FSs partially arises from the impact of 'speaker-external' factors of formulaicity (Wray, 2008) such as frequency, mutual information, idiomaticity, etc. Notwithstanding, the contradictory results related to the role of frequency and MI factors in non-native learners' formulaic language acquisition (Ellis et al., 2008; Nguyen and Webb, 2017; Simpson-Vlach & Ellis, 2010) and reductionist nature of measures hitherto addressing L2/EFL learners' formulaic competence implicate a need to investigate what 'speaker-external' formulaicity factors most influence learning FSs in the 'foreign soil' of EFL instructed settings.

2.2 The Present Study

A close look into the issue at hand posits that EFL learners likewise L2 learners in the instructed settings would have difficulty in mastering a desired formulaic competence. Many studies have already demonstrated that many foreign language learners even at high levels of language proficiency experience difficulty in formulaic language acquisition and use (e.g., Altenberg & Granger, 2001; Rafieyan, 2018; Serrano, Stengers, & Housen, 2015; Wray, 2008). Likewise, the research conducted in this study context show that EFL learners have problems in using particular collocations (e.g., Hashemi, Azizinezhad, Dravishi, 2012; Shamsudin, Sadoughvanini & Zaid, 2013). These insights necessitate attending to the factors causing this issue in EFL courses particularly in writing classes (Alali & Schmitt, 2012; Ohlrogge, 2009). However, to the best of our knowledge, studies addressing this issue hitherto have not treated formulaic competence as a multi-faceted construct in their measurements. In fact, most studies have been concerned primarily with one idiomaticity aspect in FSs and virtually have failed to have an inclusive examination of the effect of multiple speaker-external formulaicity variables on learnability of FSs.

Therefore, the present study complements the previous studies by a) measuring Iranian EFL learners' formulaic competence level, b) determining differences in receptive and productive mastery of FSs, c) examining variation in their mastery of different types of FSs, d) documenting their problems in using FSs under productive situations, and e) investigating speaker-external factors influencing FSs' learnability.

3. Methodology

In this study, based on the conviction that L2 formulaic competence development is a slow and uneven phenomenon (Henriksen, 2013; Gyllstad, 2007), a cross-sectional ex-post facto design was employed to investigate EFL learners' formulaic competence achievements.

3.1 Participants

On the basis of the dimensional sampling strategy, 63 EFL learners (40 females and 23 males within an age range of 16-36) were invited to participate in this study. They were attending upper-intermediate English courses in three language institute in Tabriz, Iran, and had received minimum three years of intensive EFL instruction. Their general proficiency, however, was estimated to range from intermediate to upper-intermediate level on the basis of their scores on the institute's replacement and achievement tests.

3.2 Instrumentation

A test battery, including a receptive formulaic knowledge test, controlled-productive formulaic knowledge test and productive writing test, was used in this study.

3.2.1 Receptive formulaic knowledge test (RFKT)

The 54-item multiple-choice test of RFKT was designed to measure the participants' receptive knowledge of 6 categories of FSs: grammar-bound FSs, transparent-fixed FSs, semi-fixed semi-transparent collocations, situation-bound FSs, academic-bound formulae and idioms (see Appendix A). The categories were adapted from Kecskes' (2007) functional model of formulaic language after replacing the categories of *phrasal verbs* and *speech formula* with semi-fixed semi-transparent collocations, and academic-bound FSs, respectively. The target FSs were chosen with seven criteria in mind:

1. Relevance to TEFL courses and usefulness to EFL learning: TEFL books (e.g., *American English File* 3 and *4*, Oxenden & Latham-Koenig, 2008; *Landmark Intermediate*, Haines & Stewart, 2000), taught currently in this study context, were utilized as available resources to pool high-utility FSs.
2. Acceptable frequency: the minimum frequency of the FSs was 520 in the Corpus of Contemporary American English (COCA), (Davies, 2008-). The corpus offers the frequency and MI information for any n-gram occurring in its corpus including more than 520 million words of texts from various genres: spoken, fiction, academic, etc.
3. High mutual information (i.e. MI score): The cut-off MI score was set on 3 using COCA. According to Hunston (2002), the MI score of 3 is the threshold where a given two-word strings could be recognized as formulaic. As a measure of strength of association, this statistical property can also verify the predictability of a sequence in discourse (apple & Trofimovich, 2017).

In writing item roots, authentic contextualized texts given in COCA and example sentences given in Cambridge and Oxford online dictionaries were utilized.

The distractors were the manipulated forms of the target FSs or the counterpart FSs with different functions. The manipulation was meant to accommodate for the impending transfer form participants' L1 (Turkish) or L2 (Persian) backgrounds.

3.2.2 Controlled-productive formulaic knowledge test (CPFKT)

For CPFKT, the RFKT was converted into a modified C-test in which the context of the items in the receptive test was left intact, while the content words in the key FSs were mutilated. This measure was intended to measure learners' ability to predict and retrieve FSs under controlled situations. The following sample item represents the test format in both measures.

RFKT:

There is no……. in arguing with kids; they are too young to understand us.

a. profit b. point c. benefit d. value e. I don't know

CPFKT sample item:

Th……. is no po…… in arguing with kids; they are too young to understand us.

(If you try to do something, it's not going to work)

To enhance item quality, we sought expert advice by inviting 3 native speakers and 4 non-native EFL teachers to critically review the initial test drafts. After revising the problematic items, the measures were piloted on 15 EFL cohorts who already had taken Martinez's (2011) Phrasal Vocabulary Size Test (PVST) as a validation tool. The correlation between PVST and our newly developed measures were 0. 67 and 0. 62 (n=15, $\rho < .05$), which could be interpreted as acceptable indices of criterion validity. As an index of reliability, the internal consistency of the measures was computed using the Cronbach alpha coefficient (α). The α indices for RFKT and CPFKT were shown to be respectively, 0.76 and 0.71, which fall within an acceptable range of reliability for a classroom-level achievement test.

3.2.3 Productive Writing Test

Laufer and Paribakht's (1998) free active knowledge test was adopted as a measure of productive formulaic knowledge. The test required the learners to write an argumentative essay of 250-300 word tokens within an hour on one of two topics: (a) Should governments be allowed to limit the number of children in families? (b) Does happiness depend on money?

3.2.4 Formulaicity Vector

To account for the gradable and varying degrees of formulaicity variables in FSs, we devised a 3-dimensional formulaicity vector on which the target FSs could be located depending on the degree of non-compositionality, fixity and socio-cultural specificity in their meanings, forms and functions respectively (see Figure 1). To this end, we followed Nguyen and Webb (2017) in rating the formulaicity variables by assigning numerical values of -1, 0 and + 1. As for non-compositionality, each FSs with high semantic transparency in meaning (e.g., *you know why*) received a score of -1 whereas semi-transparent FSs (e.g., *be fed up with*) and entirely non-compositional (e.g., *as well*) received a score of 0 and +1, respectively. Likewise, FSs with high flexibility in form (e.g., *There was no …*) or cultural-generality (e.g., *in other words*) were given a score of -1, semi fixed or semi culture-specific FSs received 0, but FSs with total fixity (e.g., *let alone*) or discourse-bound socio-cultural specificity (i.e., *in a nutshell,…*) relieved a value of +1. Thus the maximum formulaicity value was +3 given to the FSs with high fixity, non-compositionality and socio-cultural specificity (e.g., *by and large*) while the minimum value was -3 given to transparent, flexible, and culture-neutral FSs (e.g., *too ADJ to Verb*).

4. Data Collection and Analysis

The data was collected by administering the test battery in the following order: PWT, CPFKT and RFKT. This order was adopted to prevent any possible data contamination arising from test practice effect. To determine formulaic competence level of each participant, the average of their scores in the test battery, was interpreted as their Formulaic Competence Score (FCS). In evaluating participants' performances in the RFKT and CPFKT, each correct choice and response was rewarded with 1 point, while productive formulaic knowledge evaluation required calculating both language density (FLD) and formulaic language quality (FLQ) in the written essays.

Determining FLD entailed FS identification and branch-marking. First, the sequences which intuitively seemed to be formulaic were manually extracted from the collected essays. In passing judgments on the formulaic nature of the extracted words strings, the multiple-item diagnostic criteria of Wray and Namba (2003) helped us base our decisions on grammatical oddity, semantic idiomaticity, pragmatic function,

holistic unity, conventionality and linguistic sophistication of the word strings. In this respect, Nation and read (2004) recommend adopting an eclectic approach for triangulation of FS identification methods. Therefore, to reduce impending subjectivity in formulaic language identification, we consulted the COCA and Longman online Dictionary of Contemporary English whenever running into uncertainty about our decisions. For instance, for the observed phrase-frame: *one necessary thing is to …* there was no frequency in COCA, nor was there any entry in Longman dictionary based on which it was deemed to be an overextended form of the phrase-frames of: *the important thing is to* and *one thing is to.* Overused FSs (e.g. *for example*) were tolerated but misused and erroneous ones (e.g. *money is important for having *relax life; most people when they *attend to families, immediately they go over TV*) were discarded because they disregarded statistical idiomaticity and restricted exchangeability in formulaic language usage.

For benchmarking the participants' performances against native speakers', we took the initiative to adapt Carter's (1987) lexical density formula. Given the fact that FSs as multi-word units could actually be regarded as single 'big words' (Ellis 1996), 'lexical chunks' (Lewis, 1993) or 'single choices' (Sinclair, 1991), we modified Carters' formula by replacing the term *lexical words* with the term *formulaic strings*, so that could devise a practical scale of formulaic language density as follows:

$$\text{Formulaic Language Density} = \frac{\text{number of words in formulaic strings}}{\text{total number of words in the texts}} \times 100$$

To operationalize the scale, the Louvain Corpus of Native English Essays (LOCNESS) was utilized as a baseline data against which we could evaluate formulaic language density and quality in participants' essays. LOCNESS comprises of 322 American-British academic essays and as a valid yardstick, has been employed by many cross-linguistic corpus-based studies (e.g., Altenberg & Granger 2001). At first, a content analysis was run on the LOCNESS in order to extract all the four-word multi-word strings using the Ngram tool, accessed free via www.lextutor.ca/n_gram/. The reason we chose 4-word strings was that the shorter strings are also included in them and longer ones are predictable from them (Cortes, 2004). The functional analysis of the extracted strings *revealed that on average a typical native-written argumentative 500-word essay contained at least 60 FSs, which were largely three-word strings, comprising at least 40 percent of the passages. Putting this minimum FS use threshold into the above-given formula reveals that the average score of FLD in a native written argumentative essay would be 36.*

In addition to formulaic language size, formulaic language quality (FLQ) in each essay was determined by calculating the sum of formulaicity scores of the FSs used in that essay (see Section 4.2.4). As a baseline data, a rough estimate of FLQ in randomly selected 10 essays of the LOCNESS demonstrated that in the native English speakers' essays, FLQ score typically exceeded 30.

The average of FLD and FLQ scores was considered as an index of productive formulaic knowledge. In addition, the baseline levels of formulaic language density and quality *provided a sound basis to decide on the cut-off score of 36 as minimal formulaic competency level (FCL) in this study, which stood for 66% of the 54-point scoring scale implemented in RFKT and CPFKT as achievement tests. By implication, a learner to be considered rich in terms of productive formulaic knowledge was expected to achieve FLD and FLQ scores above 36 by using minimum 30 FSs in writing a 250-word argumentative essay. Moreover, because FLD and FLQ scales were flexible enough to be applied over texts of various length, all the collected essays, regardless of their size, were counted in as valid performances,* thus *the collected pieces were of an average length of 260 and ranged from 160 to 325 words.*

It should be noted that due to the fuzzy nature of formulaicity (Altenberg, 1998), our quantification of the formulaicity variables was prone to subjectivity and imprecision, as reiterated by Appel and Trofimovich (2017). Particularly, in line with Nesselhauf's (2003) report, we found it methodologically difficult to have a clear-cut distinction between what is a collocation and what is not. Therefore, we drew on FSs' congruency (i.e. the degree of Persian-English overlap in form-meaning connection for each component word in a sequence) as well as type-token frequency and MI score information in COCA, so that we could confidently decide on the degree of semantic opacity, conventionality, and the strength of association within the elements of the given

FSs (i.e. fixity). As a measure of strength of association, MI score is used to ascertain that component words in the mutli-word strings do not co-occur by chance but because of the existing internal ties within the elements of multi-words (Manning, Manning & Schuetze, 1999). Thus the higher the mutual information score, the stronger the association is between the constituents of a given FSs, which could be interpreted as an indirect index of fixity in that sequence.

In order to determine whether learners' receptive knowledge of FSs varied significantly from their controlled-productive and productive formulaic knowledge, a one-way repeated measures ANOVA was conducted in SPSS to compare the related sets of scores. But to examine variation in participants' mastery of different types of FSs, the following steps were taken.

First, the identified items were fitted into our modified version of Kecskes' (2007) functional model (see Appendix B). We also took head of Kecskes' (2000) categorization of SBUs, according to which depending on their pragmatic extension, FSs could fall into three categories of plain, charged and loaded USBs. For instance, lexical bundles (e.g., *In such a way that*…; *We can see that* ..) which appeared to be of lower degrees of socio-cultural specificity but high conventionality were put under the category of plain SBUs. Second, to establish the significance of variation in learners' mastery of FSs, one-way repeated measures ANOVA was used in SPSS to compare the mean scores, representing learners' mastery of different FSs. The analyses were run after ensuring the underlying assumptions for the parametric tests, namely normal distribution, homogeneity and Sphericity (i.e. the equality of variance of differences in the measures' scores), have not been violated seriously. *Finally, in order to* determine what factors in FSs (frequency, non-compositionality, mutual information, and socio-cultural specificity) best predict success on their mastery, multiple regression analysis was run in SPSS, version 19.00.

5. Results

As far as the level of formulaic competence is concerned, the descriptive statistics (i.e. means and standard deviations of performances in the test battery) indicate that overall the formulaic competence of the participants slightly surpassed the predetermined threshold level (M_{FCL}=37.18 >36), which means roughly a 69 percent achievement in mastery of the formulaic language tested in our measures (see Table 1). Overall this level of formulaic competence, however, was pedagogically less than satisfactory, for participants were expected to have mastered 100 % of the material in our criterion-referenced measures.

Table 1: *Descriptive Statistics of Measures of Formulaic Competence*

Measures	N	Minimum	Maximum	Mean	Std. Deviation
Receptive formulaic knowledge	63	18.00	53.00	43.17	10.18
Controlled-productive knowledge	63	10.00	50.00	38.17	10.38
Productive formulaic knowledge	63	9.00	41.00	30.22	8.19
Formulaic competence level	63	10.00	46.00	37.18	8.97

When considered separately, the mean scores in Table 1 (M_{RFKT}= 43.17>M_{CPFKT}= 38.17>, M_{PFK}= 30.22) suggest a noticeable difference between productive and receptive knowledge of FSs. As presented in Table 2, the one-way repeated measures ANOVA indicated that this difference was statistically meaningful.

Table 2: One-Way Repeated ANOVA for Mean Scores in Measures of Formulaic Competence

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
facet	Pillai's Trace	.816	135.502[a]	2.000	61.000	.000	.716
	Wilks' Lambda	.184	135.502[a]	2.000	61.000	.000	.716
	Hotelling's Trace	4.443	135.502[a]	2.000	61.000	.000	.716
	Roy's Largest Root	4.443	135.502[a]	2.000	61.000	.000	.716

In Table 3, the results show a statistically significant effect for the independent variable of measure type; Wilks' Lambda=.18, F (2, 61)= 135.50, ρ<.05, multivariate partial eta squared= .71. The effect size value of .71 indicates that differences in measure type explain %71 of the variation in the mean scores, which statistically is a very remarkable effect size (see Pallant, 2007). It means that the participants' knowledge to recognize FSs was higher than their ability to predict FSs in controlled situations and access FSs automatically in the productive writing test.

As regards the manifestation of productive formulaic knowledge in the written essays, *the underdeveloped nature of productive formulaic knowledge was evident in both the* degree and type of formulaic language participants used in their essays (M_{PFK}= 30.22). *Apart from token frequency, the total number of valid FSs identified in the essays was 389. But c*onsidering t*ype-token frequency, the formulaic language identified in the written essays could amount to 5103 words, which accounted for 30.22 %*

of the total of 16884 words produced in 63 essays. It means that the proportion of formulaic language to analytic language was smaller than the observed percentage of formulaicity in native English students' produced essays in LOCNESS (Size $_{\text{formulaic language}}$=40%). This poor level of accessibility to FSs under the productive situation of essay writing suggests that automaticity/skill aspect underlying their formulaic competence was not developed sufficiently.

The poor level of automaticity in participants' developing repertoire of FSs was also discernible form the type of errors they produced in their essays (see Table 3). Form-function analysis of erroneous formulaic patterns revealed their failure to observe the existing restricted exchangeability (statistical idiomaticity) in FSs' forms and pragmatic load associated with their functions. The most recurring erroneous patterns were of addition (freq. =42) or incorrect selection types (freq. = 36) which could reveal respectively learners' ignorance of syntagmatic attraction between grammatical elements (i.e. colligational patterns) and lexical elements (collocational patterns) in English formulaic language.

Table 3: Error Analysis of Formulaic Language Used in Essays

Error type formal	Source	Frequency	Erroneous patterns
Omission	Intra-lingual transfer	9	**As result, parents can't support them financially.*
Addition	Inter-lingual/intra-lingual transfer	58	*…., they don't have time to go *to home, *and etc.* *In life, we face *with many obstacles.* *achieve *to our wishes/ reach *to our goals*
Incorrect selection	Inter-lingual transfer	36	*Happiness depends *to many factors.* *Become tired *from life*
Elision	Intra-lingual transfer	8	*We are *suppose to feel happy.*
Overgeneralization	Intra-lingual transfer	30	**I think that government is responsible for welfare.*
Overuse	Communication strategy	28	**For example, …*
Approximation (using synonyms)	Communication strategy	11	*I want to *explain one *little story about ….*
Circumlocution (paraphrasing)	Communication strategy	21	*Poison to the *comfort of mind*
Calque (literal translation)	Inter-lingual transfer communication strategy	9	*Few children means having a *relief from responsibilities/ one *necessary thing is to …*
Misuse	Inter/intra-lingual transfer	14	*Taste the *taste of real life*
	Inter/intra-lingual transfer	11	*My *mean is ….. / aged *persons*
Redundancy	Communication strategy	12	**In this writing I am going to mention some of ….*
Priming	Intra-lingual transfer	6	*As far as* birth control *is *considered, …*
Conceptual transfer	Inter-lingual transfer	3	*It didn't occur to *the mind that …* *Money *speaks the first word (money talks).*

As for variation in the mastery of FSs, the results posit a meaningful variation in learners' mastery of different types of FSs. As depicted in Figure 1, participants' formulaic language mastery varied remarkably across different categories of FSs measured in this study.

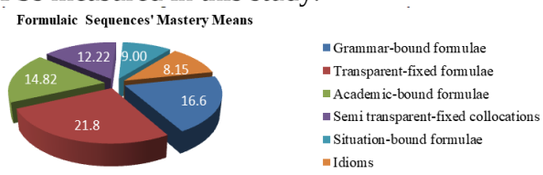

Figure 1: Descriptive statistics of learners' mastery of various formulaic sequences.

A quick glance at Figure 1 would indicate that learners' knowledge of semantically transparent and formally fixed FSs (M $_{\text{Transparent-fixed FSs}}$= 21.8) was remarkably higher than their knowledge of other FSs types, particularly culturally marked (M $_{\text{Situation-bound FSs}}$=8.15) and highly non-compositional FSs (M $_{\text{Idioms}}$= 9.00). The significance of this variance was verified by the results of the one-way repeated measures ANOVA, as presented in Table 4.

Table 4: One-Way Repeated Measures ANOVA of Mean Scores of Formulaic Sequences Mastery

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
type	Pillai's Trace	.908	114.587[a]	5.000	58.000	.000	.508
	Wilks' Lambda	.092	114.587[a]	5.000	58.000	.000	.508
	Hotelling's Trace	9.878	114.587[a]	5.000	58.000	.000	.508
	Roy's Largest Root	9.878	114.587[a]	5.000	58.000	.000	.508

a. Exact statistic
b. Design: Intercept
Within Subjects Design: type

As seen in Table 4, the results of the analysis indicate that there was a significant effect for FS type variable; Wilks' Lambda= .092, F (5, 58)=114.58, ρ<.05, multivariate partial eta=. 50. The results suggests a strong degree of association between the variation in formulaic sequences' formulaicity variables and the observed variation in our learners' mastery of them (effect size value=.50). It means that formulaicity differences in formulaic sequences explain at least fifty percent of their mastery in EFL courses.

Regarding the factors influencing FSs' learnability, the variation in learners' mastery of different FSs suggests that particular formulaicity variables in FSs affect their long-term learnability in EFL contexts. A close examination of the formulaicity continua (see Figure 2) and the mastery level in FSs elucidates the relationship between FS's formulaicity and learnability. It reveals that FSs lying at the bottom of non-compositionality and culture-specific conventionality (x & z) vectors but at the top of fixedness (y) vector were of a higher level of mastery, while those tending to be but at the top of non-compositionality and culture-specific conventionality were of the lowest level of mastery. In fact, the discernible pattern is that the higher a given FS is in terms of transparency, conventionality (cultural neutrality & frequency), and fixity, more likely it would be learnt by EFL learners; conversely, the more a sequence is idiomatic, culture-

specific, infrequent, or flexible, the less likely it would be mastered.

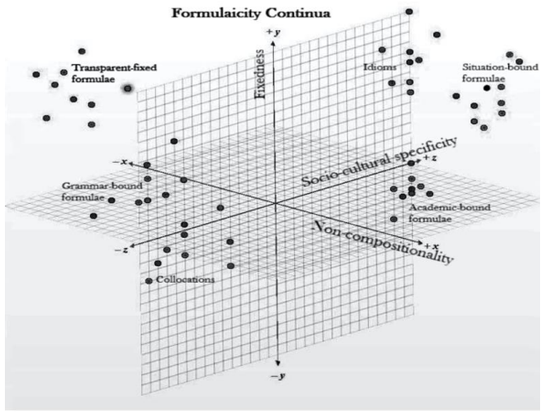

Figure 1: Fomulaicity continua accomodating for target formulaic sequences' 'speaker-external' variables.

The multiple regression analysis results triangulated the perceived association between the formulaicity and learnability of FSs. As shown in Table 5, the results reveal that factors of frequency and non-compositionality in FSs best predict success on their mastery.

Table 5: Summary of statistics, correlations and results from the regression analysis

Variable	Mean	Std	Correlation with FIMS	Coefficient β	Sig.	Part correlation coefficient (*b*)
Mastery level	72.75	29.96				
Frequency	8238	12672	.299	.234	.022	.222
Non-compositionality	3.11	1.34	-.70	-.658	.000	.625
Mutual information	3.92	1.14	.014	.148	.146	.138
Socio-cultural specificity	2.55	1.48	-.30	.087	.387	.822

Adjusted R square=.435
N=54 * p < .05

As illustrated in Table 5, a significant regression equation was found (F (4, 49) =13.17, $p<.05$) with an adjusted R^2 of .43, which means the model explains 43% of the observed variance in participants' mastery of different types of FSs. While both non-compositionality and frequency factors were of significant contribution to the prediction of the FSs' learnability as dependent variable, the factors of mutual information and socio-cultural specificity were not. More specifically, non-compositionality factor appeared to make the strongest unique contribution to the equation (β= -.65, p< .05). It reasonably explains 38 percent (*b*= .62) of the variance in the mastery of the target FSs, meaning that semantic opacity in FSs strongly but negatively affect FSs' learnability. The frequency factor was also of a significant unique contribution, though of lower degree, to FSs' learnability (β= .23, p< .05), explaining .04 percent (*b*= .22) of the variance in FSs learnability. The results mark the overriding negative impact of semantic opacity but positive impact of conventionality in FSs' learnability, as opposed to formal fixity and socio-pragmatic specificity.

6. Discussion

Our examination of EFL learners' formulaic competence achievements shows that despite years of attending EFL classes in this study context, majority of learners do not succeed to master a desired formulaic competence. Particularly productive formulaic knowledge (i.e. the automaticity or skill aspect of their formulaic competence) was not developed enough to accommodate for a native-like spontaneous *accessibility* in language production (see Widdowson, 1989). That's why in line with Weinert (1995) and Yamashita and Jiang's (2010) findings, they resorted to communication strategies such as L1/L2 translation strategy and paraphrasing in order to convey their discourse intentions. This finding corroborate Boers and Lindstromberg's (2012) claim that learners' mastery of a good repertoire of receptive formulaic knowledge often does not transform into productive knowledge. It also supports Van Lancker-Sidtis and Rallon's (2004) assertion that mastering FSs to use in productive skills is the final and most difficult stumbling block for otherwise advanced non-native speakers. This stark reality could be explained on the grounds that certain 'speaker-external' formulaicity features in FSs seem to be affecting their 'speaker-internal' formulaicity—automaticity. The results of regression analysis suggest that FSs' semantic idiomaticity in interplay with their poor conventionality (low frequency) undermine their automaticity in EFL learners' lexicon more than their pragmatic idiomaticity (i.e. socio-cultural specificity) or fixity does.

At first blush, however, the perceived intra-formulaicity relationship seems to be at odds with the common assumptions about high perceptual and instructional saliency of idioms. Idioms' as 'big words' are more salient than other FSs because their lexico-syntactic irregularity or pragmatic markedness increases their chances of being noticed and acquired by language learners (Cordier, 2013; Wray, 2013). Additionally, this set of FSs have been instructionally favoured by language teachers as they find them not just perceptually salient but instructionally challenging for language learners (Laufer & Waldman, 2011;

Vasiljevic, 2015). But this contradiction could be resolved on several accounts.

First of all, it could be argued that due to demanding nature of idioms' form-meaning processing in language production (Beck & Weber, 2016; Howarth, 1998), EFL learners like native speakers exploit more transparent FSs whose cognitive processing because does not exert much effort for synthesizing their individual components to realize particular functions. This corresponds to what we observed in LOCNESS about native speakers' tendency to use less idiomatic language in their argumentative essays. This tendency, on the other hand, promotes acquisition of transparent FSs and can account for idioms' low frequency in language use (Read & Nation, 2004; Wray, 2002).

Meanwhile, the low frequency of idioms can justify why instructionally favored and perceptually marked idiomatic FSs stand less chances of being implicitly registered for later language uses. Substantial L2 literature indicates that L2 learners' sensitivity to language use frequency results in implicit formulaic language learning (Ellis, Simpson-Vlach, Römer, O'Donnell & Wulff, 2015). Hence what Cordier and Wray hold about learnability of idioms could be true more about L2 learners in immersion programs than EFL learners who in 'foreign soil' have little opportunity to immerse themselves in natural English environments, and most of low-frequency FSs lie beyond their sociocultural experience (Liu, 2014). That is why our participants tended to avoid or underuse opaque sequences and instead adopted the communication strategy of over-reliance on transparent FSs; in Granger (1998) words, they could use transparent FSs confidently as familiar and 'safe' sequences in their writings. This finding empirically supports this speculation of Abel (2003) that an idiom's lower input frequency results in a lack of lexical representation and form-meaning mapping of the idioms in L2 learners' lexicon. It also subscribes to the long-established consensus in L2 literature that idiomaticity is a challenging part of L2 acquisition (see Irujo, 1986).

Moreover, the positive correlation between the frequency of FSs and their mastery in our study suggests that EFL learners are sensitive to the conventionality of the formulaic patterns they are exposed in language use, which qualify as empirical support for the afore-mentioned role of frequency in implicit formulaic language learning. This finding is also consistent with the research findings in corpus linguistics that FSs' high frequency gives them a holistic unity and a sense of an internal tie and inseparability, which leads to their high predictability in language use and eventual internalization in lexicon (Boers & Lindstromberg, 2012).

On the other hand, mutual information factor as a statistical index of *collocate specificity* and internal association in FSs did not appear to be significantly accounting for the observed variation in learners' performances. This empirically supports Ellis, Simpson-Vlach, and Maynard's (2008) assertion that for non-native speakers, it is not the MI but the frequency of the formula which predominantly determines its processability and influences the rate of its learning. But our findings seems to be contradicting Nguyen and Webb's (2017) results, according to which in EFL contexts MI score had more impact on collocation learnability than did the collocation frequency. It also runs against the expectation that fixity feature in FSs would be of great contribution to their learnability, for learners' reliance on FSs as 'islands of reliability' or 'fixed anchorage points' would help them construct and execute production plans or link areas of generative language in language production (Dechert, 1983). To justify this contradiction, it could be argued that the variable of fixity in our sample data was largely of a controlled nature because the MI threshold level set in sampling the FSs for our measures was 3. This implies that the degree of fixity in most target FSs were comparatively high—out of the six categories, only grammar-bound and collocational sequences were rather flexible.

In light of the above insights, there seems to be no reason to doubt that FSs' 'speaker-internal' formulaicity features in interplay with their 'speaker-external' ones overtime shapes EFL learners' formulaic language repertoire. The results posit that FSs' formal, functional and statistical manifestations of formulaicity variables in language production affect their mental representation in learners' lexicon and eventually their automatic accessibility in language production. The automaticity of FSs, in return, contribute to their conventionality as they are accessed easily as holistic chunks free of the cognitive burden and communicative stress. On the other hand, by convention, many FSs as

socially routinized and culturally institutionalized sequences are used so frequently for communicative purposes in social routines that they become automatized by all speakers of a given community (Schmitt & Carter, ۲۰۰۴). This intra-formulaicity interaction could be extended to idiomaticity and fixity features, as well. The more conventional (frequent) is a given FS in language use, the less idiomatic it becomes but the more it is established as fixed pattern in language use, which eventually renders its internalization as a prefabricated chunk in lexicon as learners can reliability register and retrieve them in language production.

7. Conclusion

This study findings support the growing consensus in L2 literature that formulaic language acquisition is the most difficult aspect of learning a second/foreign language. In this vein, our enquiry exemplified and elucidated, albeit partly, why receptive formulaic language knowledge in most EFL students is not typically transformed into productive one—it was shown that FSs' high idiomaticity, poor conventionality (i.e. low frequency) negatively influence their automaticity. This relationship substantiates the notion that formulaic language acquisition is a formulaicity-driven phenomenon—an insight which resonates with the theoretical standpoints in the usage-based accounts of L2 acquisition that language is an exemplar-based system whose mastery is primarily frequency-driven (see Ellis, 2008).

The gained insights in this study implicates that in the instructed EFL contexts, learners' formulaic competence seems to have been subject to pedagogic negligence. Hence, teachers should wary of the fact that learners' mastery of receptive formulaic knowledge does not necessarily warrant productive formulaic knowledge mastery, and accordingly they should direct their instructional focus at ensuring formulaic language automaticity (internalization) in students' lexicon. In this regard, Orlik (2018) argues that due to time-absorbing process of formulaic language acquisition, FSs should be taught in class. Thus, in agreement with Le-Thi, Rodgers and Pellicer-Sánchez (2018), learners need systematic instructional scaffolding whereby they are sensitized to language formulaicity and assisted to gain automaticity in using FSs. As an example, under the rubric of Lewis' (2000) proposed 'lexical approach', graded lists of high *utility* FSs (see Simpson-Vlach & Ellis, 2010) along with formulaically enhanced and enriched input could be prepared and incorporate into EFL materials. In addition, in evaluating writing proficiency, formulaic language density and quality could be considered as distinct sub-measures of accuracy and fluency properties.

Meanwhile, there are some limitations to be addressed for further research. This study focus was limited in several aspects. Given the size and diversity of FSs in native English speaker' lexicon (see Pawley & Syder, 1983; Schmitt & Carter, 2004), the measures we developed in this study were small-scale ones; plausibility considerations impelled us to limit the target FSs to 54 ones with certain features (i.e. rather high frequency and MI score) falling into 6 main categories. To top it off, our attempt to explain formulaic language learnability was confined to examining the impact of linguistically manifested formulaic attributes in FSs and did not include non-linguistic factors involved. As Dörnyei et al. (2004) posit, success in formulaic language mastery is to be the function of a complex interplay between formulaicity variables and non-formulaicity variables such as instructional, socio-cultural and psychological and psycholinguistic factors as well as individual learner differences. As Myles and Cordier (2017) put it, the investigation of the status of learner-external FSs in L2 learning would tell an incomplete story unless we "investigate what is formulaic in their own productions, that is, what is processed holistically or preferentially" (p. 13). Therefore, more studies with a wide scope are required to a) measure learners' knowledge of FSs with lower frequency and MI indices but various lengths (n-grams), b) explore how EFL formulaic competence development is subject to the impact of extra-and-psycholinguistic factors including proficiency, motivation, willingness to communication (WTC), working memory, etc., and c) determine how productive formulaic knowledge is manifested in writing proficiency in terms of fluency, complexity, and accuracy properties.

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Appendix A: Sample of Receptive Formulaic Knowledge Test (RFKT)

Please choose the most appropriate and correct options. If you are not sure about the correct answer, please choose option 'e'

1. To have your dreams come true, you ……. to believe in yourself.
a. are much obliged b. ought to c. would better d. have got e. I don't know

2. **Japan economy, ……. other countries' economy, expanded more rapidly in 1960s.**
a. by contrast b. in contrast to c. by difference d. indifference with e. I don't know

3. If you have a sore throat, you …… see a doctor rather than take medicine by yourself.
a. would prefer b. 'd prefer c. 'd better d. would be better e. I don't know

4. There is ……. in arguing with kids; they are too young to understand us.
a. no benefit b. no point c. no profit d. value e. I don't know

5. Today's students are highly computer-literate …… constant exposure to technology.
a. in the result of b. as a result of c. from the consequence of
d. with the consequence of e. I don't know

6. There are some times in life when we wonder ……we should go on struggling to get our goals.
a. so that b. what if c. as if d. whether or not e. I don't know

7. If we want a bright feature for children, ……, help them get a good education.
a. one important thing is to b. one necessary thing is to c. It is necessary that
d. it is important to e. I don't know

8. Anna went back to work …… her doctor had told her to stay at home and rest.
a. due to b. due to the fact c. despite the fact that
d. despite of the fact that e. I don't know

9. Feeding a baby can be a messy job,……careful you are.
a. it doesn't matter how b. no matter how c. it does wonders
d. no wonder how e. I don't know

10. She runs six miles every day to help keep herself……..
a. in shape b. on shape c. in form d. on form e. I don't know

Appendix B: Sample of Statistical information about the target formulaic sequences

Target FS	Formulaic Sequence type	Frequency	MI score	Non-compositionality	Fixedness	Culture-specificity	Mastery score
Ought to	Grammar-bound	22999	9.8	-1	1	-1	95
'd better		4702	8.25	-1	0	-1	85
As a result of		13425	4.41	-1	0	-1	110
Despite the fact that		2994	8.50	-1	0	-1	92
In contrast to		4706	3.22	-1	0	-1	107
It is important to		10961	3.19	-1	0	-1	101
No matter how		10887	6.53	-1	0	-1	92
There is no point in		1115	5.69	-1	0	0	67
Whether or not		14383	5.24	-1	0	-1	80
	transparent-fixed						
In shape		1759	4.80	-1	1	-1	107
As a matter of fact		3494	7.90	-1	1	-1	120
In common with		1687	9.32	-1	1	-1	121

Appendix C: The formulaic sequences identified in the Productive writing test

frequency	Grammar-bound formulae	frequency	Grammar-bound formulae
12	As much as	4	On the other hand
4	As well as	2	Ought to
2	Depending on	3	Rather than
1	Due to …	2	See what …
4	Due to the fact that	3	So … that
7	Enough to …	5	So much
12	First of all	6	So that
3	From …. To …	2	Under … circumstances
2	Hardly ever	3	Too ADJ to Verb
1	Having considered … ,	1	We got that …
1	How many times have you ...?	2	What makes a person happy is …
2	How much	2	What they want is …
5	I agree (with/that …)	1	Whatever they want
8	It's ADJ to …	4	Whether …or not
5	Make … Verb	4	Would rather
16	Make ….ADJ	1	You can argue that
3	More important than	3	You know why …
6	More than …	5	Be going to Verb