ESL Students Use of Alliteration and Assonance in Recalling Formulaic Language

PAUL HORNESS
International Language Education Program, Soka University, Japan
Author email: paul@soka.ac.jp

Article Information
Article History:
Received: March 24, 2020
Accepted: April 26, 2020
Available online: April 27, 2020

Keywords:
Noticing
Phonological patterns
Lexical Chunks
Formulaic language
Alliteration
Assonance

Abstract

Formulaic language, such as lexical phrases as hot as hell or pass the buck, in English is common in daily usage. Although formulaic language is common, the lexical phrases are often excluded from word lists. Second language learners of English need to use formulaic language to enhance their proficiency level. Beyond incorporating lexical phrases to word lists, other methods should be examined. This study examined the mnemonic benefit of noticing alliterative and assonant phrases with low and high proficiency learners of English. Previous research has shown that highlighting the concepts of alliteration and assonance is beneficial in recalling monosyllabic two-word units such as pet peeve or bite size. This study inquired whether the mnemonic effect is effective with longer lexical phrases beyond two-syllable phrases even when deliberative learning is not involved. Students from two public universities in Japan participated in the semester-long activity. The participants were asked to classify the phrases into different categories, and then recall the phrases over time. The results indicate that the mnemonic effect is not as clear with longer lexical phrases than it is with monosyllabic lexical phrases. Recall for alliterative expressions seemed to be better than for assonant expressions, but similar to non-salient expressions. Lower proficiency learners seem to process the longer lexical phrases similar to higher proficiency learners so the benefit of noticing alliterative and assonant expressions might be equal for both groups.

INTRODUCTION

One characteristic of advanced, proficient second language (L2) learner is a large, usable knowledge of lexical phrases or chunks (Boers & Lindstromberg, 2012; Durrant & Schmitt, 2009; Granger & Bestgen, 2014). As vocabulary lists have been revised and updated recently, e.g., new general service list (Browne, Culligan, & Phillips, 2013), so has the research into lexical phrases. Schmitt (2010) has stated that in recent years more attention has been drawn to formulaic language. An increase in technological innovation has allowed researchers to analyze larger sets of corpus. Douglas Biber and colleagues conducted numerous studies (Biber & Barbieri, 2007; Biber, Conrad, & Cortes, 2003, 2004; Biber, Johansson, Leech, Conrad, & Finegan, 1999) on multiple word phrases and found that phrases occurred 30% of the time in conversational corpuses and 21% in academic prose. Although the conversation and academic

prose presented distinctive distribution patterns of lexical bundles by native and nonnative English speakers, one conclusion to be drawn from these studies is the need for further research into formulaic language for L2 learners.

Some of the early results from lexical phrase research indicates that the use of phrases facilitates language fluency and communication (Millar, 2010; Wray, 2002). Knowledge of formulaic phrases can help learners process information faster than nonformulaic phrases receptively (Conklin & Schmitt, 2008) and productively (Wood, 2010).

A simple definition of formulaic language is not so straightforward as many researchers have included various forms of multiword units to imply formulaic language. Linguists have attempted to categorize formulaic language in a number of different ways such as transactional, functional, or social interactional. Another method adopted is from Grant and Bauer (2004) who classify multiword units into three groups: core idioms where the meaning of the parts have no clear relationship to the whole multiunit meaning; literals where the meaning of the multiword unit comes from the parts; and figuratives which is a combination of core idioms and literals. Formulaic language is broad umbrella term that includes various aspects that can be grammatically fixed, lexically variable, or sets of continuous or discontinuous terms. As Nation and Webb (2011) pointed out, "this is directly reflected in the enormous number of different terms used to describe multiword units, which include collocations, formulaic sequences, lexical bundles, idioms, core idioms, lexicalized sentence stems and so on" (p. 176). They advise any study to clearly describe the terms usage and consistently apply it throughout the study. Norbert Schmitt (2010) also lamented the lack of a specific definition of formulaic language, but considers this more a reflection of the ubiquity of formulaic language usage and the recent advances in understanding the complexity of multiword units. Schmitt, along with Wray (2008) and Wood (2010) offered a way to think about these myriads ways of defining formulaic language. Wray used the following, "A word or word string, whether incomplete or including gaps for inserted variable items, that is processed like a morpheme, that is, without recourse to any form-meaning matching of any of the subparts it may have (p. 12). Wood (2010) stated, "On a cognitive level, the term formulaic sequence has been coined in order to describe "multiword units of language which are stored in long-term memory as if they were single lexical units"(p.38). Schmitt (2010) used, "formulaic language is assumed to be holistically stored in the mind" (p. 121). For this paper, the *term formulaic language* refers to a memory retrieval process in which lexical units are holistically retained in memory, similar to a single word. This seems most appropriate as the phrases are short and each phrase was presented as one item throughout the study.

Frank Boers and Seth Lindstromberg have done much research on increasing lexical chunk knowledge through rhyme and rhythm. Boers and Lindstrom (2005) argued that in addition to frequency and utility, the criteria of memorability should be included as means of choosing vocabulary items. Phonological patterns among idioms were examined and they concluded that alliterative phrases, such as *wage war* or *precious prize*, in idioms were recalled more often than idioms without such patterns. This effect increased significantly when the participants had their attention drawn to the phonological pattern. Their results support the claim that

alliteration helps foster recall and awareness of alliteration can allow students to become more native-like in their fluency. In addition to their stated drawbacks of varying idiom length and participants' background knowledge, there was an additional drawback to the study. The drawback was that alliteration was not compared to any other language forms. These drawbacks taken together might indicate that the participants knew more about alliterative idioms than other idioms, or that highlighting the phonological pattern is better than not highlighting it.

Lindstromberg and Boers (2008a) conducted three experiments, but only the first two are directly related to this study. In the first one, they compared whether monosyllabic two-word alliterative phrases, such as *fast food* or *sea salt*, were more memorable than non-repetitive phrases, such as *cowboy* or *bath soap*. In the second one, they examined whether the alliterative phrases would be autonomously noticed. In the first experiment, their results indicated that alliterative phrases were more memorable than phonologically non-repetitive ones for both the immediate recall and delayed recognition conditions. In the second experiment, they found that only when the alliterative pattern was highlighted would the participants notice this pattern. If the alliterative pattern was not highlighted, then the students did not notice the benefit of phonemic repetition in English. They concluded that noticing this phonemic repetition pattern is a beneficial mnemonic effect for building lexical chunks. The drawbacks of this study were that a pre-test was not given, or that multiple treatment conditions were not conducted. In addition, there were few participants involved which might have affected the statistical results.

Lindstromberg and Boers (2008b) investigated whether assonance had a beneficial mnemonic effect. Similar to their previous study on alliteration, they focused on the beneficial mnemonic effect of assonance. They had 35 participants separate 24 lexical phrases into two groups: twelve assonant items, such as *town house* or *queen bee* and twelve non-repeating items, such as *tea cup or hair loss*. Thereafter, they had the participants recall freely any of the items in the activity. One week later, they had the participants do a recognition task by identifying the activity items from among an additional set of 24 distractor lexical chunks. Their results indicated that assonant items were recalled better than non- assonant items in the immediate free recall condition and in the one-week post recognition recall condition. They concluded that the noticing task was beneficial for building lexical chunks. The drawbacks to this study were similar to those of their previous ones in that the number of participants was minimal and there were only two treatment conditions: control and assonance.

Horness (2014) investigated the mnemonic effect of noticing phonological patterns, such as alliteration and assonance, in lexical chunks. The study sought to rectify the methodological drawbacks in the previous studies and demonstrate that noticing phonological patterns was beneficial to recalling lexical chunks. In this study, 35 university students participated in determining whether alliterative or assonant phrases were more easily recalled than the control phrases. It was predicted that both alliterative and assonant phrases would have a greater mnemonic effect than the control phrases. The results indicated that the noticing

activity increased the mnemonic effect for alliterative and assonant phrases when compared to the control group.

Through the studies, there are a few considerations moving forward. These considerations are intertwined and highlight the choices a teacher or researcher makes in emphasis. The first one is that Frank Boers and Seth Lindstromberg along with other researchers focused on learning each lexical phrase during class time. Time was given to learn each lexical phrase meaning through a variety of techniques. Given that the number of lexical phrases is too big to commit to memory, there is an ethical question as to what extent class time should be given to learn formulaic phrases. This leads to the second consideration of categorizing the lexical phrases. In several previous studies, it was not obvious for the participants to notice implicitly the differences between assonant phrases, alliterative phrases, or non-salient phrases. The assumption is that it is necessary to explicitly state what an assonant or alliterative phrase is to the participants at some point early in the process. The final consideration is the length of the phrase. Is a short lexical phrase, such as *tip-toe*, easier to recall or use than a long one, such as *beat around the bush*?

For this study, the focus was not learning each lexical phrase per se. The class activities emphasized the concepts of alliteration and assonance, and its mnemonic effects, which in turn limited class time in learning each lexical phrase. The use of L1 was accepted when checking the meaning in class. The participants' responses were not given a score as part of the grade.

RESEARCH QUESTIONS

As research has shown that highlighting the concepts of alliteration and assonance is beneficial to recall, this study inquires whether the length of the lexical phrase is important.

1. How effective is the mnemonic benefit when the lexical phrase chunks are increased to items that are greater than monosyllabic two-word units, such as *cool as a cucumber*?
2. When participants are not required to learn each lexical item, how is recall affected when length of time is increased?
3. How does the mnemonic benefit affect different proficiency levels with the longer lexical phrase chunks?

Hypothesis

It is predicted that both alliterative and assonant phrases will be recalled more than the non-salient phrases in all recall conditions. However, the mnemonic benefit will disappear when alliterative and assonant phrases are compared to each other, i.e., noticing both types of phrases should be equal in benefit.

METHODS

Participants

There were 296 participants from two different national universities in Japan. One university focuses on language and the other university focuses on education. All the participants were first-year students from several intact classes and were required to take an English communication course. The 48 participants from the language university were all varying in different language majors (e.g., French, Arabic, Chinese) and their English language proficiency was high (researcher's estimate of 800+ TOEIC score) although no standardized score was obtained. They are referred to as Language majors from now on. The 248 participants from the education university were from different majors and had TOEIC scores lower than 500. They are referred to as Education majors. There were two instructors involved as they both taught at both universities and had the same type of English courses.

The participants were told that the activity would help their understanding of English usage, but that the activity itself would not be graded. The participants were also told the activity was part of a research project and their participation would help teachers understand how this activity could be used in the future. If they did not want their responses used, they could request their response to be removed from the study. Finally, permission was sought from the from each university to collect and analyze the data prior the activity. Permission was granted by each university.

Material

There were 30 target phrases broken down into three categories: alliterate phrases, assonant phrases, and non-salient phrases. Table 1 shows all of the phrases that were used in the study. In each category there were ten lexical phrases greater than monosyllabic two-word units. As a range of expressions were needed to lessen the American-centric of expressions, there were a few differences in the categories such as the assonant phrases that have more expressions with an article in it than the alliterative phrases. As there is no specific collection of common alliterative and assonant phrase list like the New General Service List, the phrases were gathered from several sources, such as previous research articles (Boers & Lindstrom, 2005; Eyckmans, Boers, & Lindstromberg, 2016; Lindstromberg & Boers, 2008a, Lindstromberg & Boers, 2008b), personal knowledge, and Google searches. They were checked by asking native English speakers of varying nationalities if they were familiar with them.

Table 1
Phrases Used in the Study

Assonant phrases	Alliterative phrases	Non-salient phrases
Flat as a pancake	Proud as a peacock	Gentle as a lamb
Mad as a hatter	Blind as a bat	Hungry as a bear
Free as a breeze	Good as gold	Sick as a dog
Thick as a brick	Hot as hell	White as snow
Plain as day	Right as rain	Sweet as honey
Know the ropes	Bite the bullet	Pass the buck
Hanky panky	Back burner	Panic Button
Double trouble	Country club	White elephant
Squeaky wheel	Picture perfect	Upper hand
Happy camper	Money maker	Diddly squat

Procedures

The study occurred over the 2nd semester in the Fall of 2016. There were several dates in the semester to collect the data. During the initial collection, week one of the semester, the pre-test was given. The immediate free recall and immediate cued recall were collected in week two. In week four of the semester, the delayed free recall and delayed cued recall data were collected. In the twelfth week of the semester, the recognition recall data was collected. Although procedural steps are linear in nature, they are broken down into four phases (baseline, intervention, recall, recognition recall) to help understanding.

Phase 1: Baseline

In week one of the semester, the participants were told that the activity would help them in their English study, but the activity itself would not be used for individual grades. The activity would continue throughout the semester. The participants then took a pre-test to check their familiarity with the phrases. The participants marked each phrase with a check indicating that they either knew the phrase, was aware of the phrase, or did not know the phrase as seen in Table 2. These were collected prior to conducting the activity.

Table 2
Expression Pre-check Example

	表現 **Expression**	知っている **I know it**	何となく知っている **I am aware of it, but not exactly**	知らない **I don't know it**
1	Back burner			
2	…			
30	White elephant			

Phase 2: Intervention—steps 2-5

In week two, the participants were randomly placed into groups of three. Each group was given an envelope with 30 shuffled cards placed inside it. Each card had either an alliterate phrase, assonant phrase, or non-salient phrase. There were 10 cards from each of the categories.

In the third step, each group was asked to separate the cards into three distinct groups of 10 cards. The participants were told that there were three patterns and they needed to separate the cards into the patterns accordingly. After one group discovered an appropriate classification, the instructor announced it to the whole class verbally and wrote the category on the blackboard. For example, the instructor wrote alliterative phrases, such as *Hot as hell* and *Right as rain*. Then the instructor wrote assonant phrases, such as Know the ropes and Plain as day. Finally, the instructor wrote non-salient phrases, such as *Pass the buck* and *Panic button*. It was written similar to Table 1 above. When all the groups had separated the cards into the appropriate classification, the instructor explained the alliterative, assonant, and non-salient phrases by underlining the key the features of each as noted above. As the researcher did not observe all classes, the time it took for the classification and explanation can only be a rough estimate. There did not seem a discernable difference in time between the high and proficiency levels in finding the first pattern. Once students understood either the alliterative or assonant phrase pattern, the other two patterns were noticed quite quickly. The classification activity took approximately 10 minutes with the first pattern noticed within 5 minutes. If no pattern was noticed, the instructor wrote some of the phrases with the pattern underlined as noted above. This hint was enough for the participants to complete the activity.

In the fourth step, the participants of each group checked the meaning of each phrase. The participants could explain the meaning to each other if they knew the phrase. This was done in Japanese or English at the students' preference. Based on limited observations, most of the students confirmed their ideas in Japanese. When none of the group members knew the phrase, they were told not to guess the meaning. Rather, they could check their dictionary or ask the instructor. This process took approximately five minutes for the Language majors and about 10 minutes for the Education majors. Surprisingly, the instructors were not asked many questions directly.

In the fifth step, after each phrase had been checked for meaning comprehension, each group member took one stack of cards. Each participant was asked to check pronunciation by verbalizing the phrase out loud. After completing one stack of cards, the participants rotated the stacks of cards and repeated the process. This process took only a few minutes and there were no differences between the proficiency levels.

Phase 3: Recall—steps 6-10

In the sixth step, the participants returned to their original desk. They were given a blank piece of paper and asked to write down in English all of the phrases they had just practiced. This task

was done individually. Thereafter in the seventh step, they were given a piece of paper that had a cue (the first word of the phrase) written on it and asked to complete the phrase by writing the remaining phrase down as shown in the following example: *back* _____ (answer: *back burner*).

In the eighth step, two weeks later (week four of the semester), the participants were asked to write down in English all of the phrases they remembered in a free-recall activity. The participants were not asked to classify the phrases, but encouraged to do so if it helped them recall the phrases. Thereafter, they were given a piece of paper that had a cue written on it and asked to complete the phrase in writing for the ninth step.

In the tenth step, week four, the participants were asked to write down a similar meaning of the expression from choices as seen in Figure 1. No distractors were included to limit confusion. The expressions were listed in alphabetical order and meanings were placed in random order. The participants were given 10 minutes to complete the worksheet. Thereafter, the instructor handed out a completed worksheet to the students with all the correct answers.

	Expression	Meaning
1	Back burner	
2	Bite the bullet	
3	Blind as a bat	
	...	
30	White elephant	

Figure 1 Follow-up Exercise Worksheet for Meaning

Use the meanings below to fill in the table above
Postpone
Poor eyesight
To do something unpleasant
...
Something that is large and is expensive to keep up

Phase 4: Recognition Recall

In the eleventh step, two months later (in week twelve of the semester), the participants were given a recognition recall test in which they marked the phrases used in the sorting activity. Thirty additional phrases similar to the original 30 phrases (10 from each category) were added as distractors. The students were asked to mark ten phrases from each category and make sure only 30 phrases were marked in total.

Scoring

Scoring for the activity was done in the following ways. First, each participant had their individual responses from the hand written responses recorded in an Excel file. Excluding the pre-test, each student was then scored in a binary way, correct or incorrect, for all responses. For each of the expression categories, it was possible to get a maximum score of ten, one point for each correct expression. Each participant's score was calculated on the expression's category so each participant had 18 individual scores. Table 3 shows an example of a participant's score.

Table 3
Example of an Individual Score Across all Data Collection Points

	Expression Category		
Condition	**Alliterative**	**Assonant**	**Non-salient**
Pre-test	6.5	7.5	8
Immediate Free Recall	7	4	4
Immediate Cued recall	10	9	8
Delayed Free Recall	2	2	2
Delayed Cued Recall	4	3	3
Recognition	6	6	6

Errors were handled in the following way. First, errors that did not affect the meaning were accepted. For example, the following spelling error was acceptable: *Back Bunnar*. Second, if the error occurred in an important article, such as *Bite a bullet*, it was not acceptable and marked incorrect. The activity took place on several occasions throughout the semester, which meant some participants did not do all of the tasks. Missing data were handled in the following manner. Those participants who missed any section of the study were removed from the complete study. There were 9 Language majors and 145 Education majors that were removed respectively. Overall, 142 participants were analyzed.

RESULTS

An analysis was conducted on each collection point between the alliterative, assonance, and non-salient expressions. Based on previous studies (Horness, 2014; Lindstromberg and Boers, 2008a, 2008b), it was predicted that both alliterative and assonant expressions would have a greater mnemonic effect than the non-salient expressions. However, the noticing benefit would disappear when alliterative and assonant expressions were compared to each other, i.e. the noticing alliterative and assonant expressions should equal. Since the data did not have normal parametric distribution, Friedman's ANOVA was conducted to check the difference between the recall conditions. There was a significant difference, $X^2(11) = 683.58$, $p < .05$. Wilcoxon signed-

rank tests were used to follow-up this finding using a Bonferroni correction value of .001 for checking the level of one-tailed significance.

Pre-test

For the pre-test, items were marked in the following way: The response, "I know," was given 1 point. The response, "I am not sure," was given .5 points. The response, "I don't know," was marked as 0. Out of the 30 expressions, the pre-test indicated that the participants believed they knew on average 1.45 of the alliterative expressions, 1.24 of the assonant expressions, and 1.48 of the non-salient expressions as shown in Table 3. The result of Wilcoxon signed-rank test indicated that there was not a significant difference between the alliterative and non-salient expressions, p = .41, T = 35, z = -2.30, r = .14. There were, however, significant differences between alliterative and assonant expressions, alliterative and assonant expressions, p < .001, T = 31, z = -2.66, r = .16, and the assonant and non-salient expressions, p < . 001, T = 29, z = -2.74, r = .16. There was also a significant difference between the two university groups as indicated by the Kruskal-Wallis test, alliterative expressions $H(1) = 55.23$, p < .05; assonant expressions $H(1) = 59.96$, p < .05; non-salient expressions $H(1) = 57.73$, p < .05. The higher proficiency participants, Language major, clearly believed they knew more than the Education major participants. The Language major students claimed to know the non-salient expressions the most followed by alliterative and assonant expressions, respectively. The Education major participants believed they knew the alliterative phrases the most followed by the non-salient and assonant expressions. The most identifiable expression overall was *white as snow* (non-salient), followed by *double trouble* (assonant), and then *country club* (alliterative).

Table 4

Descriptive Statistics for the Pre-test Expressions Overall and Subgroups

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	1. 45	1.24	1.48
SD	1.92	1.78	1.99
n (LANG)	39	39	39
M	3.35	3.20	3.62
SD	2.15	2.1	2.22
n (EDU)	103	103	103
M	0.73	0.50	0.67
SD	1.22	0.80	0.11

Note. LANG = Language university; EDU = Education university

Immediate Recall

For the free recall, the alliterative expressions were recalled more than the other types of expressions as seen in Table 5. However, the hypothesis did not follow the prediction. In immediate free recall, *back burner* was recalled the most, followed by *white as snow*, and *double trouble*, respectively. The alliterative and non-salient expressions were not statistically significant, $p = .35$, $T = 43$, $z = -.941$, $r = .06$, whereas the assonant expressions were significantly different statistically from the alliterative expressions, $p < .001$, $T = 28$, $z = -4.51$, $r = .26$, and non-salient expressions, $p < .001$, $T = 34$, $z = -3.44$, $r = .20$. This indicates the non-salient expressions were recalled just as easily as the alliterative expressions, and therefore the hypothesis was not confirmed.

Table 5
Descriptive Statistics for the Expressions in Immediate Free Recall

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	2.97	2.28	2.77
SD	2.12	1.83	1.89

For the immediate cued recall, the pattern similarly followed that of the immediate free recall and as expected with greater recall because of the cue. The main difference though was that all the conditions were statistically distinct. As seen in Table 6, alliterative expressions were recalled the most with cues followed by non-salient expressions and assonant expressions, respectively. The top three recalled expressions were slightly different as *good as gold* was recalled the most followed by *white as snow* and *double trouble*. The Wilcoxon Signed Ranks Test yielded significant differences between the alliterative expressions and non-salient expressions, $p < .001$, $T = 23$, $z = -6.34$, $r = .12$; between the alliterative expressions and assonant expressions, $p < .001$, $T = 15$, $z = -7.85$, $r = .23$; between the assonant expressions and non-salient expressions, $p < .001$, $T = 38$, $z = -3.38$, $r = .13$. The hypothesis was slightly inaccurate for immediate cued recall condition. The alliterative expressions were significantly higher than the non-salient expressions. However, the assonant expressions were significantly lower than the non-salient expressions. The alliterative expressions should not have been significantly different from the assonant expressions.

Table 6
Descriptive Statistics for the Expressions in Immediate Cued Recall

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	5.19	3.68	4.17
SD	2.78	2.80	2.73

Delayed Recall

After two weeks, the free recall activity was conducted again. The alliterative and non-salient expressions were recalled equally on average as seen in Table 7. There were no statistically significant difference between the alliterative and non-salient expressions, p =.07, T = 38, z = -.41, r = .02, non-salient and assonant expressions, p = .06, T = 47, z = -1.57, r = .09, or between alliterative and assonant expressions, p = .34, T = 41, z = -1.49, r = .09. *Double trouble* was recalled twice as much as the other expressions. It was followed by the expressions of *white elephant* and *white as snow*. The hypothesis was inaccurate again as there were not significant differences in recall between the expressions. Compared to the immediate free recall, the scores dropped by at least one point with alliterative expressions with the biggest decline followed by non-salient expressions and then assonant expressions.

Table 7
Descriptive Statistics for the Expressions in Delayed Free Recall

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	1.36	1.18	1.36
SD	1.40	1.31	1.18

For the cued recall, the alliterative expressions were recalled the most followed by the non-salient and assonant expressions, respectively, as shown in Table 8. The alliterative expressions were recalled statistically significantly more than the non-salient expressions, p < .001, T = 32, z = -4.52, r = .26, and assonant expressions, p < .001, T = 18, z = -6.75, r = .40. The non-salient expressions were recalled statistically significantly more than assonant expressions, p < .001, T = 32, z = -3.36, r = .19. *Double trouble* was also recalled twice as much as the other expressions. It was followed by the expressions of *good as gold* and *white as snow*. The hypothesis again mirrored the previous inaccuracies. Alliterative and assonant expressions should have been recalled better than non-salient expressions and equal to each other, but that was not the case.

Table 8
Descriptive Statistics for Expressions in Two-week Post Cued Recall

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	3.87	2.66	3.12
SD	2.53	2.40	2.30

Recognition Test

After twelve weeks, 142 participants took the recognition test. The alliterative expressions were recalled the most followed by the assonant and non-salient expressions, respectively, as shown in Table 9. There was a statistically significant difference between alliterative and assonant expressions, $p < .001$, $T = 21$, $z = -3.77$, $r = .22$ alliterative and non-salient expressions, $p < .001$, $T = 14$, $z = -6.54$, $r = .38$, and between the assonant and non-salient expressions, $p < .001$, $T = 34$, $z = -3.24$, $r = .19$. The most recognized expression was *back burner,* followed by *double trouble*, and *good as gold*, respectively. *White as snow* was also recognized well. The hypothesis was supported here in that both alliterative and assonant expressions were recognized more than the non-salient expressions. However, the alliterative expressions were recognized better than the assonant expressions so that does not support the hypothesis.

Table 9
Descriptive Statistics for Expressions in One-month Post Recognition Test

	Expression Category		
	Alliterative	**Assonant**	**Non-salient**
N	142	142	142
M	6.64	6.17	5.76
SD	3.28	3.35	3.45

A final analysis incorporated the Kruskal-Wallis test to compare each recall condition (dependent variable) between the two universities (independent variable). As expected, there was a significant difference between the groups. The Language majors had a higher mean rank than the Education majors (See Appendix). Table 9 indicates the scores between the universities for each condition. For the most part the score changes followed a similar pattern for both groups. The free recall score was lower than the cued recall score. The immediate recall score was higher than the delayed recall score. The only surprise was the recognition scores of the Education major participants. Their assonant average score rose and their non-salient score dropped.

Table 9
Expressions' Mean Scores and Standard Deviations by Condition and University

	Alliterative		**Assonant**		**Non-salient**	
	Lang	**Edu**	**Lang**	**Edu**	**Lang**	**Edu**
	n = 39	**n = 103**	**n = 39**	**n = 103**	**n = 39**	**n = 103**
Immediate Free Recall	4.56 (2.23)	2.38 (1.75)	4.15 (1.95)	1.57 (1.15)	4.48 (2.11)	2.13 (1.36)
Immediate Cued recall	7.54 (2.90)	4.31 (2.16)	7.00 (2.80)	2.44 (1.46)	7.10 (2.60)	3.10 (1.86)

	Alliterative		Assonant		Non-salient	
	Lang n = 39	Edu n = 103	Lang n = 39	Edu n = 103	Lang n = 39	Edu n = 103
Delayed Free Recall	2.23 (1.85)	1.03 (1.02)	2.60 (1.71)	.78 (.83)	1.85 (1.34)	1.18 (1.07)
Delayed Cued Recall	5.97 (2.81)	3.01 (1.87)	5.50 (2.90)	1.60 (.87)	5.50 (2.70)	2.33 (1.32)
Recognition	9.90 (.30)	5.40 (3.04)	9.80 (.43)	7.80 (2.90)	9.70 (.66)	4.30 (2.88)

Note. Mean scores are on top followed by standard deviation in parenthesis; Lang = Language major, Edu = Education major.

DISCUSSION

The first research question asked whether the mnemonic effect of alliteration and assonance remained when the expression became longer. The answer might not be as clear-cut as the results indicated. The non-salient expressions in this study were recalled equally to the alliterative and assonant expressions when learners were asked to write the expressions in recall. In the recognition recall, however, it seemed the mnemonic effect remained. This is different from the results from Horness (2014) and the conclusions drawn from Lindstromberg and Boers (2008a, 2008b).

The second research question asked whether recall over time affected the mnemonic effect. As one would expect, the general answer is that recall diminishes rapidly in free recall but less so in cued recall. Recognition seemed to be relatively strong after twelve weeks. Perhaps the productive writing task of recall was too taxing compared to the recognizing task of checking the expressions, and therefore the scores were low comparatively. Compared to Horness (2014), recognition scores were higher, almost double, in this study. Perhaps the supplemental activity to encourage recall through a meaning-matching task was helpful, which led to higher recognition scores. It is difficult to compare the previous research overall as the methods and timing were different depending on the study. Nonetheless, in Lindstromberg and Boers (2008a), the results correspond favorably with the recognition recall. They had the participants do a recognition recall after two weeks with similar results. This is interesting because their participants deliberately learned the material in class whereas the participants in this study had limited opportunities. When comparing immediate free recall, the participants in Lindstromberg and Boers's alliterative study (2008a) recalled on average 10.5 out of 13 alliterative phrases, whereas this study average was 4.6 out of 10 for the Language majors which were similar to Lindstromberg and Boers's participants' proficiency. When comparing Lindstromberg and Boers's assonant study (2008b), their participant's average was almost 6 out of 12 while in this study's Language major's average was 4 out of 10. Through these comparisons, it might indicate that when deliberative learning is involved, recall for alliterative phrases increases more than when limited learning is involved. However, when learning assonant phrases, deliberative learning might only be as effective as limited learning.

The third research question asked whether language proficiency had an effect on the mnemonic effect. Although the Language majors had higher proficiency scores to begin with, the overall pattern of scores indicated a similar noticing effect. It seemed that the lower proficiency students had more difficulty in producing assonant expressions than in recalling them. The noticing activity was beneficial for all the participants and the similar recall pattern indicated that proficiency is not a factor in affecting recall. Thus, the mnemonic effect is same for different proficiency levels.

Taken on the whole, the results indicate that alliterative and assonant expressions are not recalled more than non-salient expressions depending on the situation. If the pre-test mean scores were examined against the recognition test mean scores at the end, one can see that assonant expressions had the greatest improvement in recall. In this case, the alliterative and assonant patterns seem to help recall more than non-salient expressions. However, when learners are asked to recall the patterns by writing them down in free or cued recall, the benefit of recognizing the assonant pattern seemed to diminish. The alliterative pattern stayed strong in all cases of recall, either passive or productive. Lindstromberg and Boers (2008a, 2008b), had similar findings to Horness (2014) in that immediate free recall of assonant phrases and alliterative phrases were recalled more than non-salient phrases. It is interesting to note that the studies by Lindstromberg and Boers were focused on deliberate learning and Horness (2014) was not, but the mnemonic effect was apparent in all of them. Although a slightly different focus (deliberative learning), method (no repeated measure), and length of lexical item (sentence level) were used in Eyckmans, Boers, Lindstromberg (2016), the mnemonic effect for alliterative phrases disappeared after ten days when compared to non-salient phrases when participants wrote the responses after given a cue. It would seem the length of the lexical phrase does affect the mnemonic effect for alliterative and assonant phrases.

For a direct comparison when compared to Horness (2014), the results are similar and different in several ways. First, and most importantly, the hypothesis that the alliterative and assonant expressions would be recalled better than non-salient expressions was not the case in all the conditions. In this study, for the immediate free recall, non-salient expressions were recalled just as much as the alliterative expressions. In the two-week post free recall, recall for alliterative and non-salient expressions was the best. In the two-week post cued recall, the non-salient expressions were recalled better than the assonant expressions. Second, the pattern of recall of the expressions was similar. In Horness (2014), cued recall after two weeks was better than immediate free recall. In this case, cued recall was always higher than free recall, even the post two-week cued recall was higher than immediate free recall. Finally, recognition of the expressions was different from start to end. In Horness (2014), the leaners indicated in the pre-test that they knew around two-thirds of the expressions, while in this study, the learners indicated that they knew less than 20 percent of the expressions. In Horness (2014), learners on average recognized about 3.5 expressions after three months while in this study, learners, on average, recognized almost six of the ten expressions.

LIMITATIONS

One of the main drawbacks of this study is that students were not asked to memorize the expressions deliberately, intently, or actively. Outside of the initial awareness pre-test, separation activity, and follow-up exercise in weeks one and four, the participants were not required to use the expressions in any other classroom activity. One of the study's attempt was to focus on the noticing activity of separating the expressions into groups, and not the memorization of the expressions. Although this is a limitation of the study, one natural benefit of it was that the participants used the concepts of alliteration and assonance correctly when writing expressions in the free recall sessions, albeit writing incorrect responses for the study, such as *hungry as a horse*. A

PEDAGOGICAL IMPLICATIONS

There are several implications from this study. First, the noticing activity was enjoyable for the participants. The activity generated interest and enthusiasm in the classroom as reported by the teachers involved in the study. Second, identifying the alliterative and assonant patterns was not obvious. As a conscious-raising activity, the noticing of the patterns by separating the cards into groups seemed to be effective. Third, it appeared the noticing activity was not enough for productive recall as the amount of recall seemed to be only half of the items at most; therefore, explicit learning is necessary as advocated by Nation's (2007) Four Strands method. A small amount of language focused learning may heighten the activity's mnemonic benefits. Greater time on task with some explicit learning of the expressions over a consistent amount of time might increase productive recall which was found in Eyckmans, Boers, Lindstromberg (2016). Fourth, as mentioned previously, the concept of alliteration and assonance was demonstrated to be learned through the activity. The participants were able to produce new forms of the expressions which is ultimately the goal. Finally, the noticing activity would support Conklin & Schmitt's (2008) assertion that formulaic phrases can help learners process information faster than nonformulaic phrases receptively. By noticing the pattern, students might be able to recognize alliterative or assonant expressions more readily in reading or listening.

CONCLUSION

Not surprisingly, the results become less clear for the mnemonic effect as more factors become involved. First, some of the participants in this study had lower proficiency levels than in the previous studies. The pretest indicated that many of the lexical phrases were not known to them. Even though the cognitive demands of recall for this group might have been difficult, it appears the mnemonic effect worked regardless of proficiency level. Second, the pre-test indicated that the phrases *double trouble* and *white as snow* were the most known. These phrases were recalled the most in each of the recall events. However, the alliterative phrase

country club was the most known pre-test item but other alliterative phrases were recalled more. This might indicate that for lower proficiency learners, the alliterative phrase is easier to recognize than the assonant phrase. For these participants, comparing the vowel sounds in a lexical phrase might have taken more time to understand. The assonant phrases were the least well known and least recalled in all the cases except in the final recognition test. As reported in the other studies and observed in this one well, the participants were not able to readily discern the different patterns. It may be that alliterative phrases are easier to process at the beginning and it takes more time to understand the assonant vowel process with longer lexical chunks. Nonetheless, researchers such as Boers, Lindstromberg, and others have highlighted an import gap in acquiring English as an L2 that formulaic phrases are common in daily usage, and there are ways to highlight their prominence.

THE AUTHOR

Paul Horness, Ph.D. is presently an associate professor at Soka University in Tokyo teaching in the TESOL Graduate Program. He has several areas of research interest. The main area is assessment which he has examined listening skills and the spacing effect. He is specifically interested in how memory and repetition plays a role in comprehension.
paul@soka.ac.jp

REFERENCES

Biber, D., & Barbieri, F. (2007). Lexical bundles in university spoken and written registers. *English for Specific Purposes, 26*, 263–286.

Biber, D., Conrad, S., & Cortes, V. (2003). Lexical bundles in speech and writing: an initial taxonomy. In A. Wilson, P. Rayson & T. McEnery (Eds.), *Corpus linguistics by the Lune: A festschrift for Geoffrey Leech* (pp. 71–93). Frankfurt, Germany: Peter Lang.

Biber, D., Conrad, S., & Cortes, V. (2004). If you look at ...: Lexical bundles in university teaching and textbooks. *Applied Linguistics, 25*(3), 371–405.

Biber, D., Johansson, S., Leech, G., Conrad, S., & Finegan, E. (1999). *The Longman grammar of spoken and written English*. London, UK: Longman.

Boers, F., & Lindstromberg, S. (2005). Finding ways to make phrase-learning feasible: The mneumonic effect of alliteration. *System, 33*, 225–38.

Boers, F., & Lindstromberg, S. (2012). Experimental and intervention studies on formulaic sequences in a second language. *Annual Review of Applied Linguistics, 32*, 83-110.

Browne, C., Culligan, B., & Phillips, J. (2013). The New General Service List. Retrieved from http://www.newgeneralservicelist.org.

Conklin, K., & Schmitt, N. (2008). Formulaic sequences: Are they processed more quickly than nonformulaic language by native and nonnative speakers? *Applied Linguistics, 29*(1), 72–89.

Durrant, P., & Schmitt, N. (2009). To what extent do native and non-native writers make use of collocations? *International Review of Applied Linguistics, 47*, 157-177.

Eyckmans, J., Boers, F., & Lindstromberg, S. (2016). The impact of imposing processing strategies on L2 learners' deliberate study of lexical phrases. *System, 56*, 127–39.

Granger, S., & Bestgen, Y. (2014). The use of collocations by intermediate vs. advanced non-native writers: a bigram-based study. *International Review of Applied Linguistics in Language Teaching, 52*, 229-252.

Grant, L., & Bauer, L. (2004). Criteria for redefining idioms: Are we barking up the wrong tree? *Applied Linguistics, 25*(1), 38 - 61.

Horness, P. (2014). The beneficial mnemonic effect of alliteration and assonance in recalling lexical chunks. *JACET-KANTO Journal, 2*, 42-56.

Lindstromberg, S., & Boers, F. (2008a). The mnemonic effect of noticing alliteration in lexical chunks. *Applied Linguistics 29*, 200–222. doi: 10.1093/applin/amn007

Lindstromberg, S., & Boers, F. (2008b). Phonemic repetition and the learning of lexical chunks: The mnemonic power of assonance. *System, 36*, 423-36.

Millar, N. (2010). The processing of malformed formulaic language. *Applied Linguistics, 32*, 129-148.

Nation, I. S. P. (2007). The four strands. *Innovation in Language Learning and Teaching, 1*(1), 1-12.

Nation, I. S. P., & Webb, S. (2011). *Researching and analyzing vocabulary*. Boston, MA: Heinle Cengage Learning.

Schmitt, N. (2010). *Researching vocabulary: A vocabulary research Manual*. London, UK: Palgrave Macmillan.

Wood, D. (2010). *Formulaic language and second language speech fluency*. London, UK: Continuum International Publishing Group.

Wray, A. (2002). *Formulaic language and the lexicon*. Cambridge, UK: Cambridge University Press.

Wray, A. (2008). *Formulaic Language: Pushing the Boundaries*. Oxford, UK: Oxford University Press.