L2 Vocabulary Retention in Typically Developing Children and Children with Learning Disabilities: Comparing Individual Words and Multi-Word Items

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Abstract

Learning a second/foreign language is a challenging process for the memory capacity of all students. This task becomes even more challenging for students with Learning Disabilities (LD) as they are weak in short and long-term memory. This study wishes to contribute to this field and aims at investigating the short and long-term retention of: a) individual words and b) multi-word items in Typically Developing (TD) children and children with Learning Disabilities (LD). It was hypothesized that the L1 meaning of multi-word items would be better retained in memory compared to individual words.

The participants were fifty-two English language learners (33 TD and 19 LD) aged from 9 to 12. A hyperlinked computerized text was provided with morphosyntactic information for the 10 items (six individual words and four multi-word items) and retention scores were then examined in short and long-term memory.

Results indicated statistically significant between group differences in both tasks with TD children performing significantly better than the LD group. As regards within group differences, the retention percentages of the multi-word items were higher (though not statistically significant) than those of the individual words in both short and long-term memory in both groups.

Keywords: *learning disabilities, foreign/second language vocabulary, short-term memory, long-term memory, multi-word items;*

1. Introduction

"*Word*" is perceived by Moon (2001:43) as an arbitrary unit defined as 'a *string of characters, or a sequence of one or more morphemes, which is bounded at either end by a space or by punctuation'.* Longer word units, under the term '*multi-word items'*, are described by Moon (2015:120) as '*lexical items which consist of more than one word and have some kind of unitary meaning or pragmatic function".* Multi-word items is a superordinate term and the different types are idioms, proverbs and proverbial sayings, phrasal verbs, binomials and trinomials, similes, formulae and prefabs or prefabricated sentences. The large range of types found in literature and the vague boundaries among them, as well as the range of terms (e.g. multi-word phrases/expressions, lexical phrases, prefabricated chunks, formulaic sequences), which are often conflicting, make their study a complicated one.

Research in the related literature indicates that formulaic language and multi-word items are an essential part of language learning. Nattinger and DeCarico (1998:1), in a rather behaviourist view, claim that language use is '*routinised formulas'* and '*prefabricated language chunks'* and as such, it is a product of our habit and ritualization. Skehan (1998) supports that idioms, semi-fixed lexical phrases and collocations, facilitate learners' fluency in L2 especially when under real-time conditions, while Schmitt and Carter (2004) regard chunk mastery a prerequisite for learners to approach a native-like L2 language command. Chunk mastery would then require a strong short and long-term memory for these to be recalled and used in action. However, children with LD face difficulties in this area and typically fall behind when compared to their peers (Gathercole & Baddeley, 1993).

This study aims at comparing short and long-term L1 meaning retention of individual words and multi-word items in L2 learning not only of TD but also of LD school aged children, as research in the field of LD in L2 is reported to remain void (Difino & Lombardino, 2004). The two research hypotheses pursued are:

A) H_1. There is a statistically significant difference in retention between a) individual words and, b) multi-word items, in short and long-term memory of both groups.

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B) H_2. There is a statistically significant difference in retention scores between the TD and LD groups.

2. Research on multi-word items

Boers and Lindstomberg (2005) indicated that sound effects (alliteration) have mnemonic benefits of L1 prefabricated chunks. The same authors, in 2009, compared L1 and L2 chunk acquisition and showed that prefabricated formulaic language retrieval from memory in people's L1 is better compared to later languages. Laufer and Girsai (2008) investigated the effects of three instructional methods on L2 words and collocations learning: content-oriented tasks, text-based tasks and L1 to L2 translation tasks and vice versa. Results indicated that L1 translation was the most effective of the three. In a recent guest editorial, Siyanova-Chanturia (2017) reviewed 6 studies examining the L2 teaching and learning of multi-word expressions. More specifically, the author reported the studies of: a) Nguyen and Webb (2016), who argued that receptive knowledge of two types of L2 collocations was limited among Vietnamese learners, b) Macis and Schmitt (2016), who investigated knowledge of L2 ambiguous idioms and found that despite their high L2 proficiency, Chilean's knowledge of the idioms examined was about 33%, c) Eyckmans and Lindstromberg (2016), who claimed that phonological similarity assisted the recall of intentionally learned L2 unknown idioms, d) Boers, Dang and Strong (2016), who examined the effectiveness of 3 kind of phrase-focused exercises, and concluded that the most effective was the one that involved selection of the entire phrase from a list, e) Pellicer-Sanchez (2015), who examined incidental learning of L2 pseudoword collocations from reading and findings supported the effectiveness of reading for incidental learning of both words and collocations (pseudowords) and finally, f) Choi (2016), who concluded that enhanced reading (bold typeface) assisted the processing and learning of L2 collocations.

3. Learning Disabilities and memory

Children with LD face reading and writing difficulties when learning a language due to weaknesses in the perceptive and cognitive processes. As regards short-term memory, research has indicated that students with LD perform poorly in tasks that require language processing particularly when the time period between the presented stimulus and the recall is long. Hence, the limited short-term memory, together with the ineffective use of the phonological code and the poor use of internal organizational and revision strategies, reportedly cause problems to long-term memory (Swanson, Cooney & McNamara, 2004). Although long-term memory is considered unlimited in capacity, lack of effective organizational strategies and the superficial processing of semantic representations lead to its limitation (Wong, 1982). In support of the above, Swanson (1984, 1987) argues that students' failure to incorporate the visual and language mnemonic traces of visually presented stimuli, at the time of storing, causes the problems in long-term memory.

4. Method

4.1 Subjects

The participants were 52 English language learners (33 TD and 19 LD) aged from 9 to 12, attending a language school at A1 level (CEFR).

4.2 Procedure

The experiment was conducted in a computer class environment, following a study by Ypsilandis (2014). A list of target-to-learn-vocabulary was initially provided to check that all items were unknown to the participants. A hyperlinked text was then provided with morphosyntactic information for 10 items (six individual words and four multi-word items). Individual words and multi-word items retention scores were examined in short and long-term memory through two post-tests after an hour and after a week respectively. The assessment tests a) Giro giro oli (Talli, Stavrakaki & Sprenger-Charolles 2014), and b) Raven's coloured Progressive Matrices (Sideridis, Antoniou, Mouzaki, & Simos, 2015) were administered to identify the participants with LD (a) and to assess their non-verbal IQ (b).

5. Analysis

Retention percentages for individual words and multi-word items in both TD and LD groups are offered below.

	POST-TEST1	POST-TEST2	DROP
TD			
Individual Words	50,5%	37%	-13,5%
Multi-Word Items	63,7%	55,5%	-8,2%
LD			
Individual Words	21,1%	9,7%	-11,4%
Multi-Word Items	27,7%	23,7%	-4%

Regarding the first hypothesis, descriptive statistics indicated that retention percentages of multi-word items were higher than the individual words in both short (post-test1) and long-term memory (post-test2) for both TD and LD groups. However, a Paired-Samples T-test (for the TD group which presented a canonical distribution) and Wilcoxon Signed Ranks test (for the LD group which presented a non-canonical distribution) indicated no statistically significant differences between the variables.

Notice also that, short-term memory percentages drop considerably from the teaching target in both groups of participants and for both tested items. Long-term retention drop continues (less than the one registered in short-term memory) in both groups. However, a higher drop is registered in the TD group compared to the LD one.

With reference to the second hypothesis, TD children performed better compared to LD children in both individual words and multi-word items in both short and long-term memory retention. Mann-Whitney tests indicated statistically significant between-group differences in all tested variables.

Test Statistics[a]

	Individual Words Post-test 1	Individual Words Post-test 2	Multi-word Items Post-test 1	Multi-Word Items Post-test 2
Mann-Whitney U	150,000	146,500	127,000	119,000
Wilcoxon W	340,000	336,500	317,000	309,000
Z	-3,161	-3,191	-3,644	-3,691
Asymp. Sig. (2-tailed)	,002	,001	,000	,000

Finally, it should be pointed that final long-term memory retention of the LD group is considerably low as this group lost a considerable amount of the learning target at the short-term memory test.

6. Discussion

Despite the registered differences in the scores of individual words and multi-words items in both short and long-term memory, the first hypothesis was not fully supported by the evidence as the differences were not statistically significant. Nevertheless, differences between the TD and LD groups proved to be statistically significant with the TD group scoring significantly better in all measurements than the LD group, thus confirming the second hypothesis.

It is possible to conclude, similar to relevant research in the field (Ypsilandis, 2014; Ypsilandis & Mouti, 2017), that retention of vocabulary items is never the targeted 100%. Further, it may be argued that both TD and LD groups exhibit the same learning and retention pattern with the multi-word items scoring higher. It is surprising that the LD group registers a smaller drop percentage from short to

long-term memory compared to the TD group. This indicates that the problem with LD learners remains at the level of processing information (closer to short-term memory) and not at the level of long-term retention and recall. This result may come in contrast to previous research according to which LD children exhibit difficulty in long-term information *recall* at which they were exposed (Swanson, Cooney & McNamara, 2004). Should the findings of this study be further confirmed, attention may be drawn on intensifying LD children's teaching to initially support short-term vocabulary learning. Findings of this experimental and original work are submitted to the scientific community in the hope of raising discussion on the topic.

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