Incidental Learning of the Target Language System through a Semi-artificial Language

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Article Info	**Abstract**
	In recent years, there have been studies on incidental learning utilizing semi-artificial languages at the sentence level focusing on specific grammatical features. This study investigates whether extended exposure to texts in a semi-artificial language would result in incidental learning of the target language system. A pretest/posttest experimental design was adopted. Learners in the experimental group were exposed to texts both in English and a semi-artificial language system while learners in the control group were only exposed to texts in English. A grammaticality judgment test, error analysis, and semi-structured interviews were used to evaluate learning and learners' perceptions of their own learning. The experimental group scored significantly higher in the post-test than the pre-test in the grammaticality judgment test while the control group did not. Error analysis did not result in a significant difference across two writing tasks in either group in the number of errors, though the experimental group demonstrated a decrease in four error categories as opposed to one by the control group. The interview data showed an increased awareness of the structural difference between the two languages and also the target language system. Results may indicate that using semi-artificial languages facilitates awareness and learning of the L2 input.

Introduction

It is not uncommon for second language teachers around the globe to explain language forms in class or give exercises in class or as homework to practice a specific target language form (Uysal & Bardakci, 2014). However, learners keep making errors. For example, Turkish learners of English make mistakes commonly in prepositions, articles, verb-tense, pluralization and word choice which were documented by various small-scale studies focusing on their errors in writing (e.g., Atmaca, 2016; Erkaya, 2012; Kırkgöz, 2010; Kirmizi & Karci, 2017; Taşcı & Ataç, 2018). Anecdotal experience also confirms this and explicit treatment and corrective feedback do not seem to help much when it comes to certain errors. In such learning situations, the learners' attention is on language form and they deliberately try to learn those forms. This contrasts with situations in which the learners are engaged in meaning-focused tasks and possibly acquire formal features of the language as a by-product of such tasks. The distinction described here could be referred to as intentional and incidental learning, respectively. Hulstijn (2003) defines incidental learning for experimental contexts as not

informing participants of a follow-up test. According to Schmidt (1994, p. 16), on the other hand, incidental learning is "learning of one thing (e.g., grammar) when the learner's primary objective is to do something else (e.g., communicative)". By the same token, Boers (2018, p. 2) views incidental learning as "a by-product of communicative activities in which language learners pick up features of the target language while they are primarily engaged with the content or the message of utterances." In contrast, for intentional learning to take place, learners should deliberately focus on the language code (Boers, 2018). This is the understanding of the incidental and intentional learning adopted in this study.

Hulstijn (2003) mentions that in the literature there are some studies on incidental learning of L2 vocabulary and there are almost no studies focusing on incidental and intentional learning of L2 grammar. However, in recent years, there have been empirical studies focusing on incidental learning of L2 grammatical features (e.g., Bell & Collins, 2009; Denhovska & Serratrice, 2017; Denhovska et al., 2016, 2018; Francis, et al., 2009; Hamrick, 2013, 2015; Williams, 2010; Zhao et al., 2021). These studies found that learners could demonstrate learning of grammatical agreement patterns in a novel language (Denhovska & Serratrice, 2017; Denhovska, et al., 2016, 2018), gender markers (Bell & Collins, 2009) and novel word orders (Francis et al., 2009; Hamrick, 2013, 2015). Some of these studies investigating incidental learning involved semi-artificial language systems (SALS). Rogers et al., (2015, p. 275) explain that "the lexis in semi-artificial languages is presented in the L1, or a well-known L2, of the participants of the study … often combined with morphosyntactic features of a different language, which represent the learning target of the experiment." Various experiments (e.g., Grey et al., 2014; Rebuschat & Williams, 2012; Rogers et al., 2016; Tagarelli et al., 2015; Williams & Kuribara, 2008) documented evidence of learning of L2 features in a SALS paradigm in incidental learning conditions. For example, Rogers et al., (2016) exposed English-speaking participants to Czech nominative and accusative markers in sentences formed with English words except for one inflected Czech noun either in nominative or accusative cases. A total of 24 Czech nouns were used twice, once in the accusative and once in the nominative case. Participants were tested with a grammaticality judgment test with a new set of 48 sentences. They found that the experimental group, who were exposed to Czech morphology incidentally performed significantly better than the untrained control group. In another study, Williams and Kuribara (2008) exposed English-speaking participants to Japanese structures within sentences formed with English words and Japanese markers. The results demonstrate that a subset of their exposure group, who they named scramblers, showed higher acceptance rates of the structures they were trained than the no-exposure group although not in all structures. Experiments like these demonstrate that the target language system can be learned even after a short and limited amount of exposure to certain aspects of the target language system. They also mostly used sentences as the input stimuli in short experimental treatment phases. They did not involve longer discourse as linguistic input.

There have been studies, however, centering on incidental learning of vocabulary through reading of texts (e.g., Dang & Long, 2023; Day et al., 1991; Hulstijn, 1992; Hulstijn & Trompetter, 1998; Yali, 2010; Yi & DeKeyser, 2022). For instance, Day et al. (1991) investigated the incidental learning of vocabulary by Japanese EFL students in a high school and three universities. They had the participants do a sustained silent reading of a short story for pleasure and tested their knowledge of 17 target words using a multiple-choice test following the reading. In both high school and university students, the treatment group, who read the story scored significantly higher than the control group, who did not read the story, leading the authors to conclude that through exposure, unknown words could be learned and recognized by the students and EFL programs should incorporate an extensive reading component to help learners' improve their knowledge of vocabulary. In another study, Hulstijn (1992) had participants read a four-page Dutch text about the function of advertising for producers and consumers followed by six comprehension questions and tested 12 target words in meaning-to-be-inferred and meaning-given conditions. All groups received an unexpected post-tests on the target words. The author concludes that although there was some gain in the incidental learning condition when learners inferred the meaning, retention of words was very low compared to the intentional learning conditions. In another study (Yali, 2010), the subjects were asked to read two texts including 26 target words. The students in the incidental learning condition were given comprehension questions whereas the intentional learning tasks involved vocabulary exercises. The results indicated significant gains in both conditions. However, when the procedures involved intentional learning, gain and retention improved. In a recent study, Dang & Long (2023) investigated the exposure to online news and found evidence of incidental learning of core academic words.

Another issue that is related to incidental learning is the learner awareness of the resulting knowledge. Rogers (2017) explains that there are two main methods of investigation concerning awareness, namely retrospective verbal reports, where students are asked to verbalize the underlying rule given in the input and testing materials of the experiment, and subjective measures of awareness, where learners are asked about the source of knowledge (e.g., guessing) and their confidence about their choices. Using subjective measures of awareness, while some studies (Grey et al., 2014; Rogers et al., 2015; 2016) did not find explicit knowledge. Nevertheless, Rogers (2017) found evidence of explicit knowledge in subjective measure of awareness when he grouped confidence scale into two categories although in the retrospective verbal reports, no participant was able to verbalize the rule of case marking in the SALS.

The studies that investigate incidental learning of vocabulary involved reading passages to be read in one sitting followed by the test procedures. Studies on incidental learning of L2 grammar focused on sentences rather than texts unlike the ones on vocabulary. In addition, studies involving semi-artificial language paradigm that aim to investigate incidental learning of grammatical form involved sentence level treatment of specific language forms. There do

not seem to be reading studies involving extended reading of texts in SALS and focusing on learning of the target language system in general rather than focusing on a specific form. Hence, this study investigates whether extended exposure to SALS could be used to teach the target language system incidentally and whether this kind of exposure would result in increased awareness of the target language system. The reason for using SALS over natural languages is that using the SALS paradigm provides several benefits. Given that adult learners already have an established language system, which could impede or influence the subsequent acquisition of additional language systems (Bialystok, 1997; Bialystok & Hakuta, 1999; Flege, 1999; Iverson et al., 2003; Kanik, 2018; Pierce et al., 2015; Sebastián-Gallés et al. 2005), the use of SALSs, since they use L1 vocabulary, may facilitate the noticing and acquisition of the L2 system by freeing up some mental effort. For example, when a SALS is used, more focus and effort would be exerted to process the target language system because there will be no efforts to understand the semantic meaning because the vocabulary will be in the L1. Moreover, since the presented texts will seem like a distorted version of the L1, the SALS may lead participants to notice and process where things are in the input material by manipulating the already existing language system. Thus, in this study, a SALS, which can be referred to as *Turkish*, is employed. This language uses the words and morphemes of the Turkish language but the sentences are formed based on the English language. More details are given in the Methods section.

Particularly, this study seeks to answer the following research questions:

1. Does extended exposure to texts in a semi-artificial language result in incidental learning of the target language system?
2. Does extended exposure to texts in a semi-artificial language result in increased grammatical accuracy in writing?
3. Does extended exposure to texts in a semi-artificial language affect students' awareness of the target language system?

Methods

Participants

Thirty-two students registered for the freshman Reading course in the undergraduate program in English Language Teaching at a university in North Cyprus. These students graduate as teachers of English as a foreign language. All the students are native speakers of Turkish and are from Turkey and North Cyprus. These students were divided into two groups randomly by using the last digit of their student identification number's being odd or even, resulting in 17 students in the control group and 15 students in the experimental group. Twenty of the students were female while 12 of them were male. Six students in each group were male. The mean age was 20.19. Nine students in the experimental group were also interviewed.

Instruments and Procedures

In this study, both quantitative and qualitative data were collected. The instruments were a grammaticality judgment test (GJT), a placement test, two writing tasks, and interviews. A pre-test post-test experimental design was chosen as the research design. To establish the effect of the variable instruction, two tests were administered before the treatment. One test was a placement test given to ensure that there was no existing difference in terms of language level between the experimental and control group. The other test administered before the intervention was a GJT. In constructing the GJT, an adapted version of the grammatical categories in DeKeyser (2000; adapted from Johnson and Newport, 1989) were employed. Two pairs of sentences in English for each category and subcategory were written. The list was given to an applied linguist to evaluate the assignment of sentences to correct and incorrect categories and the assignment was judged as correct.

After the GJT was formed, it was piloted with 10 students. The reliability coefficient (KR-20) obtained from the pilot administration of the test was .82. Nine sentences with low correct response rate were selected and given to the students again. However, in the second administration, they were provided with a sheet including those nine sentences and asked to decide whether they thought the sentences were correct or not and then explain. Their explanations showed that the low rate of correct responses was due to a lack of knowledge in that grammatical category or possibly as a result of the influence of their native language, Turkish. For example, furniture in Turkish can be pluralized and students accepted furnitures* as correct in the test. After finalizing the GJT, it was administered to the participants together with the placement test. The GJT was timed. Students saw each sentence on a screen for 10 seconds and marked their answer on a sheet.

The internal reliability coefficient for the GJT in the pretest was .84 (KR-20). The Kolmogorov-Smirnov test was run for the GJT and the placement test and the test distribution for both tests were normal. Thus, Pearson Correlation was run and the correlation between the two tests was acceptable, yielding a value of.73.

Another source of data was students' writing samples from mid-term and final exams of a writing class they were enrolled in, which were used for error analysis. Unlike the other SALS studies that employed SALS in the test materials, this study employs a natural language (i.e., English) in the instruments. Thus, both the placement test and the GJT as well as the writing tasks were in English.

Treatment

As part of the reading course, students read paragraphs and short texts to develop skills of skimming, scanning, critical reading, identifying the topic, main idea, supporting details, facts and inferences, text organization and so on. The experiment was administered in this class. The experiment was based on mere exposure to texts in SALS. There was no explicit teaching of any linguistic categories. However, the two groups differed in only one aspect. Although both groups read the same texts to analyze for the topic, main idea, etc., the control group

did an initial reading of the texts in English while the experimental group read a version of the text which kept the original structure of the sentences but the words and morphemes were in Turkish. These texts are not grammatically correct in Turkish because the sentence structure was completely based on English. They sounded like distorted versions of Turkish texts. This procedure was administered over 10 weeks. Students read 37 paragraphs or short texts produced in that way. An example sentence in SALS (adapted from Mikulecky and Jeffries (2007)) is as follows:

Neden, dir altın, böyle değerli? Doğru, o, dur parlak, uzun ömürlü, ve nadir, ama o, dir

Why   is   gold so   valuable true   it   is   shiny   durable   and rare but it is

çok daha az kullanışlı, den birçok diğer mineraller veya metaller.

far less   useful   than many other minerals and metals.

The actual word order of the sentence in modern Turkish should normally read as follows:

Altın   neden bu kadar değerli-dir? Doğru, o, parlak, uzun ömürlü   ve   nadir-dir,

Gold   why   so   valuable-is   true   it shiny   durable   and rare-is

ama birçok başka   minarel   ve   metal-den   daha az kullanışlı-dır.

but   many   other mineral and metal-than less   useful-is

After the experimental teaching, a post-test was administered using the same GJT. Semi-structured interviews were also conducted with nine participants in the experimental group. Interviews continued until the data reached saturation. The data were analyzed using qualitative content analysis.

Results

Before the experimental teaching, the students were given a test to identify whether the two groups were at a comparable level in English although they already took a test at the foundation school to be able to enroll in the program. For this purpose, a placement test of a publication of an international publisher targeting adult and young adult learners was used (i.e., English Unlimited by Cambridge University Press). The test is available on the website of the publisher. Since this test mainly focuses on grammatical knowledge, it was considered relevant to the GJT that is used as a pre-test and a post-test. The results are given in Table 1.

Table 1. Placement test

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Control	17	73.9412	11.62148	.198	28.197	.844
Experimental	15	73.0667	13.17176			

An independent-samples t-test indicated that scores of the experimental group (*M* = 73.0, *SD* = 13.1) were not significantly different than those of the control group (*M* = 73.9, *SD* = 11.6), *t* (28.197) = .198, p > .05. The results suggest that the students were at a comparable level in English before the treatment began.

In answering the first research question (i.e., Does extended exposure to texts in a semi-artificial language result in incidental learning of the target language system?), the results of the GJT was used.

Grammaticality Judgment Test

Students then took a grammaticality judgment test as a pre-test and also as a post-test to see if the groups differ in their scores as a result of the experimental teaching. For this purpose, paired-sample t-tests were calculated for both the control and the experimental groups.

Table 2. Pre-test post-test statistics of the control group

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pre-test	17	69.6471	9.05498	-.761	16	.458
Post-test	17	70.8235	9.93249			

The paired-samples t-test indicated that the pre-test scores of the control group (M = 69.6, SD = 9.05) were not significantly different from their post-test scores (M = 70.8, SD = 9.93), t(16) = -.761, p > .05.

Table 3. Pre-test post-test statistics of the experimental group

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pre-test	15	67.8000	11.43428	-2.703	14	.017*
Post-test	15	71.1333	11.50693			

The paired-samples t-test indicated that the experimental group performed significantly better in the post-test (M = 71.1, SD = 11.5) than the pre-test (M = 67.8, SD = 11.4), t(14) = -2.703, p < .05, with a medium effect size, d = .69.
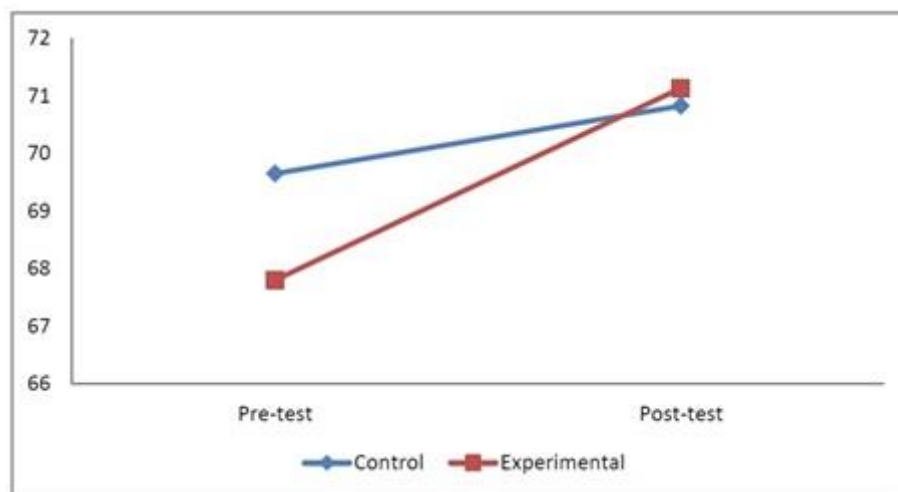

Figure 1. Performance of the control and experimental groups across pre-test and post-test

The results of the GJT demonstrate that there was more gain in the experimental group who were exposed to the SALS.

In answering the second research question (i.e., Does extended exposure to texts in a semi-artificial language result in increased grammatical accuracy in writing?), the results of the error analysis of the writing samples were used.

Writing tasks

A second variable investigated is the number of errors students made in the writing tasks. The reason to investigate the errors is to see whether the experimental reading task has any influence on productive skills since the treatment was based on exposure without explicit treatment of forms. Writing in the field of error analysis initiated by Corder (1981), Keshavarz (2015) came up with a detailed taxonomy of errors, which was used to identify errors. A coding guide was prepared with minor adaptations and a coding sheet based on the categories in the coding guide. Since the purpose is first to see whether there is a quantitative difference between the students' task performances, the number of errors and the number of words were coded. Besides, since the students produced different sizes of paragraphs, errors per 100 words were calculated for each student and the averages were taken and analyzed using the paired-sample t-test for each group. The results are outlined in tables 4 and 5.

Table 4. Errors of the control group in midterm and final writing tasks

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Task 1	17	16.0075	7.51928	.166	16	.870
Task 2	17	15.7184	7.00012			

The paired-samples t-test indicated that the number of errors per 100 words made by the control group in the midterm writing task (M = 16.00, SD = 7.51) was not significantly different from that in the final writing task (M = 15.71, SD = 7.00), t(16) = .166, p > .05.

Table 5. Errors of the experimental group in midterm and final writing tasks

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Task 1	15	21.1357	10.25553	2.107	14	.054
Task 2	15	17.2861	10.09966			

The paired-samples t-test statistics of the experimental group show that the difference between the first writing task (M = 21.137, SD = 10.255) and the second writing task (M = 17.2861, SD = 10.09) is only marginally insignificant, t(14) = 2.107, p > .05.
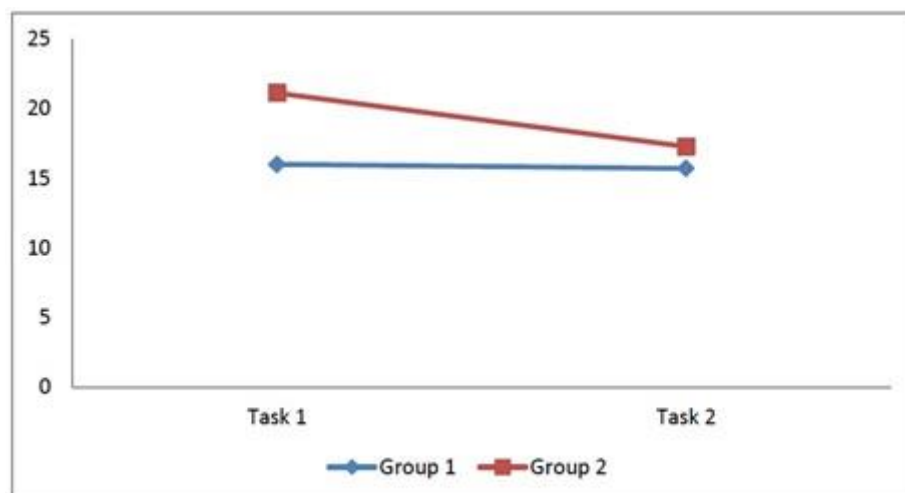

Figure 2. The number of errors per 100 words across writing task 1 and 2

As can be seen from figure 2, there is a quantitative decrease in the experimental group, albeit not significant, while the performance of the control group remained almost constant across two writing tasks. The common errors made by the two groups were also analyzed statistically to see if there were any significant differences between the two tasks in individual errors. Figure 3 and Figure 4 show the averages of the two groups across two tasks.
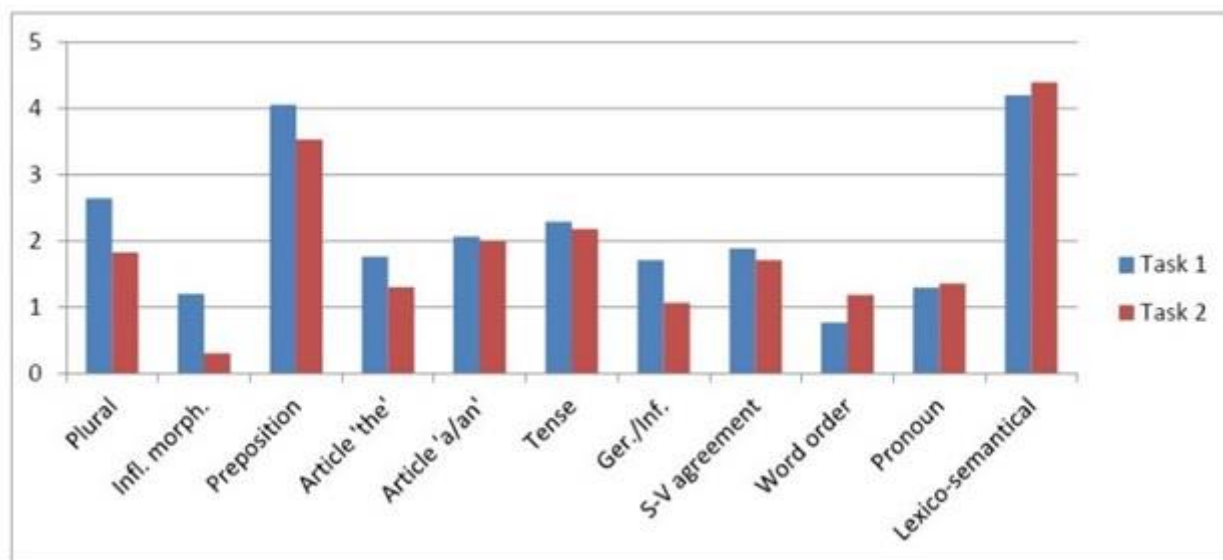

Figure 3. The average number of common errors by the control group across task 1 and task 2

Figure 3 displays the average number of common errors made by the control group across task 1 and task 2. When paired-samples t-tests are run for these errors, the only category that results in a significant difference is the category of inflectional morpheme between task 1 (M=1.1765, SD= 1.38) and task 2 (M= .2941, SD= .5878); t(16)= 2.308, p= .035, with a medium effect size, d=.56.
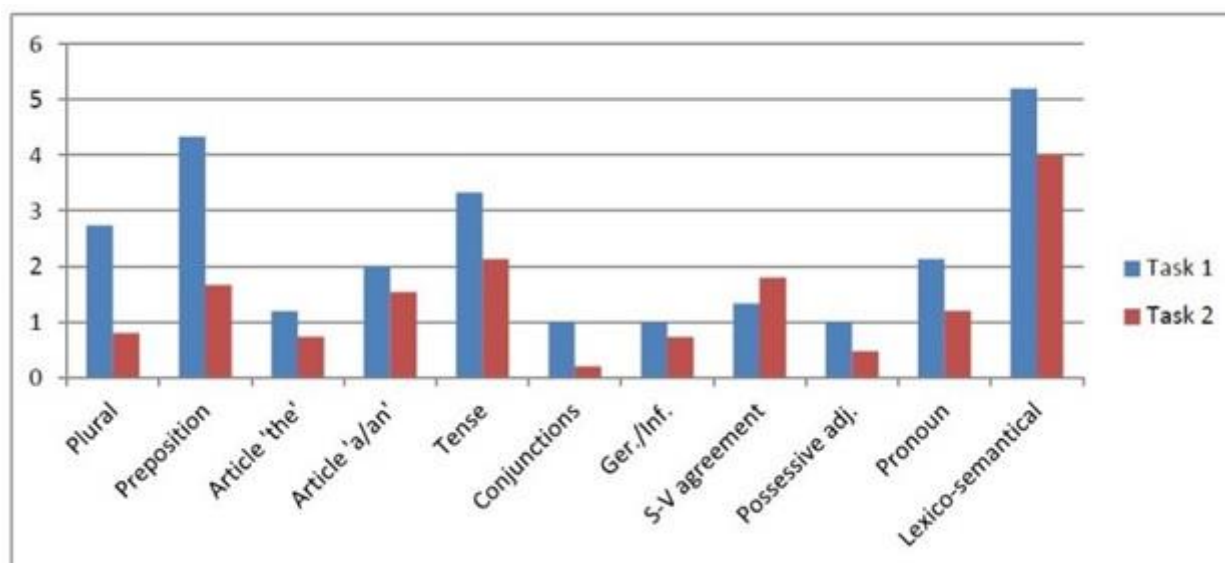

Figure 4. The average number of common errors by the experimental group across task 1 and task 2

Paired samples t-test run for the common errors made by the experimental group revealed significant differences in four categories, namely plural, prepositions, conjunctions, and pronoun. Incorrect use of plurals decreased significantly between task 1 (M=2.7333, SD= 2.46) and task 2 (M= .80, SD= .7746); t(14)= 2.875, p= .012, with a medium effect size, *d*=.74. Similarly, prepositions also demonstrated a significant decrease in errors between task 1 (M=4.3333, SD= 2.91) and task 2 (M= 1.6667, SD= 1.8387); t(14)= 3.081, p= .008, with a large effect size, *d*=.80. Also, in task 1 (M=1.00, SD= 1.1338) students made significantly more errors of conjunctions than they did in task 2 (M= .20, SD= .4140); t(14)= 2.449, p= .028. The effect size is medium, *d*=.63. Finally, students made fewer errors about pronouns in task 2 (M= 1.20, SD= 1.3201) than in task 1(M=2.1333, SD= 2.1995), resulting in a significant difference; t (14)= 2.357, p= .034, with a medium effect size, *d*=.60. It seems that the reading tasks implemented in the class influenced the productive skills as seen in the errors made in writing tasks by the control group and the experimental group.

In answering the third research question (i.e., Does extended exposure to texts in a semi-artificial language affect students' awareness of the target language system?), the analysis of the qualitative data gathered via interviews was used.

Students' perceptions

The analysis of the interview data revealed that the procedure had cognitive effects on students. The themes related to this aspect retrieved from the qualitative analysis are as follows:

Structural difference between L1 and L2

One point that some students made is that the structure of the two languages is different. It seems that the experimental teaching helped students become aware of the structural differences between their L1 and L2. They seem to consider this as a beneficial factor for their reading and understanding in L2. One student said:

> *The structure of Turkish and English are different. It sounds nonsense but you understand. It proves helpful.* (E, female, 19)

By "nonsense," she refers to the texts written in SALS. Another student made an interesting point regarding the experimental teaching. What she refers to as Turkish is the SALS using the Turkish words.

> *The structure of the two languages is very different. If I read just the English version, I can understand. If I just read the Turkish version, I do not understand but if I read Turkish and then the English version, then whichever version I read, I feel as if I read both languages at the same time.* (Z, female, 19)

Awareness of the L2 system

One of the themes related to the cognitive effects of the experimental teaching was awareness of the L2 system. Students felt that the reading tasks helped them comprehend the L2 system

and become aware of how English sentences are formed and also helped them internalize patterns of the L2 system. They expressed:

> *It became easier for me to understand the formation in English text after reading the Turkish text. I read the Turkish text and then the English one. I think it had an effect on my comprehending the structure of English.* (K, female, 21)

> *I understand better where things should go.* (E, female, 19)

Perceiving details

Another related aspect brought up by the students was *perceiving details.* They found the reading practice to help guide their attention to details. As one participant reported:

> *It helps comprehend its structure because this, what we call Turklish, gives the exact counterpart, for example "only three". It gives us the direct translation of it piece by piece - how can I explain - as if investigating everything piece by piece.* (E, female, 19)

Other students reflected similar sentiments and related attending to details as a factor contributing to increased awareness of the L2 system and use.

> *When I see a text in English I can understand in more detail - I mean - since it takes words like this, I started understanding these words in my brain just like this - I mean - I perceive in a more detailed-oriented way.* (M, male, 18)

Representation of both systems in mind

Interestingly, there were several references to thinking in both languages simultaneously. Students felt that their mind processed both languages. This was true both for receptive and productive acts as well as the written and spoken language. Some comments follow:

> *Even when I read the Turkish version only, my brain translates that to.. I perceive it as English. I translate that to English; I put it in English order. While I read like değil bütün şirketler, my brain reads it as "not all companies." My brain translates it to English simultaneously.* (M, male, 18)

> *I actually associate both (languages).* (S, female, 19)

One student expressed that there was an influence of the tasks on her everyday language use even in her native language.

> *When I speak Turkish, I speak like this one. I speak in an inverted way. Since I work, I always speak in my daily life. I speak according to the pattern in English. I stop, I straighten up. I speak like that.* (S, female, 19)

Noticing the gap

Several students raised the issue of noticing during the interviews. These were both related to noticing the features of the target language and noticing their mistakes. Participants identified it as critical for correcting their mistakes and for progressing well in learning English. They felt that they were surprised to see some of the things they thought were true were in fact not. The following excerpt illustrates this point:

I was thinking that I was progressing well but thanks to this text I learned that I was not actually progressing well, that I was doing wrong, thanks to this, thanks to this text, I was able to recover from my mistakes for instance. What I thought was correct was actually incorrect. For example, I used to think the use of "is" there was perfectly correct but apparently, it was not actually so. (T, female, 23)

The analysis of the interview data demonstrated that the treatment had an effect on students' awareness of the target language system and how it is different from the L1 system and in some cases, it possibly resulted in explicit knowledge as the quotation above reveals.

Discussion

The results of the GJT showed significantly higher scores by the experimental group, but not the control group. Likewise, in writing tasks, there was a quantitative decrease in the number of errors made and also significantly lower mistakes in four error categories in the experimental group as opposed to only one category in the control group. These results, which indicate learning by the experimental group, are in line with the results of studies by Grey et al. (2014), Rebuschat and Williams (2012), Rogers et al., (2016), Tagarelli et al. (2015) and Williams and Kuribara (2008), who found that learners were able to learn the target language system in experiments utilizing implicit or incidental learning of SALS. In these studies, researchers set specific morphosyntactic aspects of a target language as the learning goal (e.g., German verb placement rules). The current study, however, did not set a specific learning target and employed texts rather than sentences. Therefore, the focus of the listed studies and this study are somewhat different. This study shows evidence of learning of the target language system in general through a GJT focusing on various aspects of the language and through error analysis of written tasks.

Hamrick and Sachs (2018) point out the limitations of studies that involve SALS in terms of the methodology used to establish evidence of learning. They state, however, that the concerns raised apply to studies that do not implement pretest/posttest designs and comparison groups. To overcome such methodological concerns, this study employs a pretest/posttest design and a comparison group to indicate the learning effect of the experimental teaching. Also, unlike studies that implement SALS in the GJT, this study employs a natural language, English, in the test. Thus, the concerns raised by Hamrick and Sachs (2018) about untrained controls such as feeling confused and frustrated because of lack of training do not apply to the current study. In this respect, the results of the study indicated learning of a natural language through exposure in an SALS paradigm. The effect of the experimental teaching was tested in terms of both receptive and productive skills. It was evident that the experimental teaching made a positive difference. Since both the control group and the experimental group were exposed to the same texts in the target language, the difference observed was due to the exposure to the target language within the context of Turkish lexis. In this way, manipulating the L1 system seems to help accommodate the L2 system.

The increased performance of the experimental group may be due to the salience created by SALS. Whether incidental learning using SALS paradigm results in implicit (unconscious) or explicit (conscious) knowledge has been a topic of interest (e.g., Rebuschat & Williams, 2012, Rebuschat et al., 2013; Williams, 2005). It has been widely held that adult second language learners need explicit training especially when it comes to learning of some of the L2 system (Ellis, 2011, p. 35), unlike children who acquire their L1 system without any explicit instruction. Nevertheless, in this study, which employs incidental learning, the resulting knowledge may be of the explicit kind. Since expectation and salience are considered to be factors that facilitate noticing, which in turn may promote intake formation and processing (Schmidt, 1990), chances of learning some aspects of the target language system may be increased by the exposure to SALS, because in the experimental reading, students were exposed to texts in their L1 but the words and morphemes were not in the places they were expected to be, but they were like in the target language system. Hence, their awareness of where linguistic units go may be raised. This is confirmed by the interview data, as several students mentioned that the texts attracted attention and they understood better where things should go in English and noticed features and mistakes they made. When the systematic nature of the input is perceived, it may be better accommodated and mapped onto the existing knowledge, which may explain the better performance by the experimental group. Ellis (2011, p. 45) believes that implicit learning mechanisms of L1 are not enough to acquire the second language and "SLA must therefore overcome the processing habits of the L1 by recruiting additional resources of explicit learning." Thus, although the teaching was incidental in this study, the learning may have involved explicit learning mechanisms because of using SALS as implied by the interview data. Hamrick (2013) found in his experiments that even after brief exposure to non-native syntax, the participants formed explicit knowledge of the novel syntax. The interview data in this study revealed that the procedures helped learners become aware of the target language system.

The analysis of the interview data also revealed that exposure to SALS helped students become aware of the differences between the L1 and L2. This may itself be beneficial for language acquisition as research supports that the awareness of differences between languages (Ammar et al., 2010) or contrastive metalinguistic input comprising differences between the L1 and L2 (Kupferberg, 1999; Kupferberg & Olshtain, 1996) has a facilitating effect in SLA. In this respect, awareness of structural differences might have facilitated accommodation. This gain is significant because normally it is difficult to master the target language when it is structurally different from the native language (Bialystok, 1997; citing Marinova-Todd, 1994), as is the case in this study. Regarding this issue, Bialystok (1997, p. 129-130) argues "The linguistic structure of our first language sets important boundaries around subsequent linguistic structures that we attempt to learn. This means that first language acquisition is fundamental and guides and influences second language acquisition." If this is the case, both the control group and experimental group should face difficulty to overcome the constraining

effect of the L1 knowledge because "the overarching structure that sets out linguistic categories are not built up from scratch in second language acquisition" (Bialystok, 1997, p. 131), yet the simple exposure to the target language system within the context of the vocabulary of the native language made a significant facilitating effect for the experimental group, possibly minimizing the difficulty of constraints of a structurally-different L1. The control group was exposed to the same language samples but completely in the target language. For this group, the improvement was minimal. The structural difference between the two languages probably contributes to this slow development.

Interview data also revealed that the students think L1 and L2 are represented and associated in their minds. After a period of exposure to *Turkish*, students seem to associate two languages in mind rather than having two language systems in conflict or competing with each other. This is relevant to Cook's (2008) model of multi-competence. Cook (2018) rejects the independent grammars assumption because first language and the second language coexist in the same mind. Multi-competence refers "to the overall knowledge that combines both the first language and the L2 interlanguage" (Cook, 2018, p. 15).

On the other hand, it has been argued that existing knowledge of the L1 is a constraining factor in learning an L2 (e.g., Bialystok, 1997; Flege, 1999, Iverson et al., 2003; Sebastián-Gallés et al., 2005). In a recent theoretical model (Kanik, 2018), I have argued that there is a hypothetical mental mechanism in the mind of learners, which is there to protect the (developing) knowledge of the first language. He named this mechanism as system preservation device (SPD). According to this model, SPD is there to protect the L1 system, which in turn causes increasing constraints on second language acquisition as the knowledge of a language develops. According to this model, because SPD is there to protect the L1 system, any subsequent input that follows some acquisition of L1 is checked against the existing system. If the input is identified as a threat, there will be resistance towards that input. If not, the acquisition of subsequent input will be facilitated. After the L1 system begins to establish, the subsequent L2 input will be incorporated over the existing and developing L1 system. I suggested SALS as a possible technique to flex the existing system. The results of this study seem to support this proposal because the experimental learning tasks were manipulating the L1 knowledge to accommodate the L2 system by employing an SALS.

The writing tasks revealed the number of errors the experimental group made decreased from task 1 to task 2. This decrease was not significant at the probability level of .05 (*p=.054*), but on the borderline of statistical significance. Furthermore, the decrease was statistically significant in four categories as opposed to only one category in the control group. Although there is no clear consensus on the benefit of error correction on writing accuracy (see, for example, Bruton, 2009; Ferris, 1999, 2004; Russell & Spada, 2006; Truscott, 1996, 2007), during the writing class sessions, both groups of students received oral and written feedback on their classroom writing tasks. Thus, the difference cannot be attributed to factors related to the availability of feedback. Yet, the experimental group seem to have improved on accuracy

more so than the control group, which may indicate that exposure to input that manipulates students' L1 may be an effective strategy.

Thus, the results of the study indicated a pedagogical value in using the SALS paradigm to teach natural languages, especially if the native language and the target language are quite different as is the case in this study. However, it would be naïve to expect second language teachers to produce extended materials in SALS to expose their learners to the language as a whole. From a practical perspective, it would be very useful to address aspects of the target language that students have difficulty comprehending and producing or persistent mistakes learners make. Teachers may produce remedial materials that incorporate SALS using native language words and the aspect of the target language system when they observe difficulty with certain aspects of the target language system. In the interview data students expressed that they noticed that some of the things they thought were true were in fact not. This suggests that procedures such as the one in this study may serve useful pedagogical functions to remedy persistent mistakes or fossilized patterns. Although language teachers may not produce extended materials in an SALS, they may be able to produce brief introductory materials. This might increase awareness of the target language features before students are exposed to the input in the target language, which, however, begs further research. It has to be acknowledged that teachers who speak learners' L1 could produce remedial or introductory SALS materials in EFL environments where learners are likely to speak the same L1.

Conclusion

The present study investigated whether exposure to an SALS over time results in learning of the target language. The results provide evidence that targeting L1 in teaching rather than L2-only results in improved acquisition of the L2 system although the study was conducted in one setting with freshmen college students. Since both groups of students were exposed to the same target language texts, it is plausible that increased performance by the experimental group is due to increased awareness and a more flexible L1 system because of the exposure in words and morphemes of their native language. Yet, this needs to be validated by further studies, especially with larger sample sizes. In addition, studies that use various other testing procedures than GJT would contribute to this line of research. Also, studies using Functional MRI would be useful to identify whether exposure of the kind in this study results in any changes in the structural organization in the brain.

Conflict of interests

Funding

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