

MEASURING IMPLICIT AND EXPLICIT GRAMMATICAL KNOWLEDGE IN SECOND LANGUAGE ACQUISITION

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Abstract

Previous research shows that due to nonfacilitative first language (L1) transfer, second language (L2) speakers do not develop implicit knowledge of certain grammatical structures. Therefore, the present paper investigates whether L1-Sinhala–L2-English speakers (hereafter L2 speakers) could acquire implicit knowledge of English object pronouns. To achieve this goal, it compares data collected via an acceptability judgement task (AJT) and an oral production task (PT). The AJT measured explicit knowledge, whereas implicit knowledge was measured by the PT. The two tasks tested the knowledge of object pronouns by L2 speakers. The object pronominalization differs in Sinhala and English. Object pronouns are expressed overtly in English. Sinhala has overt and null object pronouns. However, null object pronouns are ungrammatical in English. Under the facilitative transfer from Sinhala, L2 speakers would be target-like on object pronouns. On the other hand, under the nonfacilitative transfer, they would accept null object pronouns. A prediction was also made regarding the two tasks. If L2 speakers had acquired explicit and implicit knowledge of object pronouns, they would have similar results in the two tasks. L1-Sinhala–L2-English speakers (n=28) served as an experimental group. Native English participants (n=17) served as a control group. The AJT presented 10 grammatical (as in 1a) and 10 ungrammatical (as in 1b) tokens. In the AJT, the participants rated the 2nd utterance in each dialogue on a six-point Likert scale. In the PT, they responded to 10 questions designed to elicit object pronouns.

1. Do you see your friends?
 - a. Yes, I often see them. S-V-ObjPro
 - b. *Yes, I often see. *S-V-∅

In the AJT, the L2 speakers differentiated between the S-V-ObjPro structure and the *S-V-∅ structure. However, in the PT, they used *S-V-∅ structure more frequently. Therefore, the results suggest that implicit knowledge of object pronouns is still unavailable in L1-Sinhala–L2-English interlanguage.

1. Introduction

Previous research shows that due to non-facilitative first language (L1) transfer, the development of implicit knowledge is much slower than the development of explicit knowledge. Therefore, the present paper investigates whether L1-Sinhala–L2-English speakers could acquire implicit knowledge of object pronouns in English.

Implicit and explicit knowledge was first studied in cognitive psychology, and later it developed as one of the central topics in cognitive psychology (Perruchet, 2008; Cleeremans, Destrebecqz, & Boyer, 1998;). Similarly, implicit and explicit knowledge has a long-stand interest in second language acquisition research (Ellis, 2005, 2008; 2009, 2011). Initial studies in the field of second language acquisition come from the studies of Krashen (1981). Krashen

(1981) maintains that implicit knowledge involves subconscious internalization of grammar rules, whereas explicit knowledge involves conscious formulation of grammar rules and structures. However, he did not define what he meant by 'subconscious' and 'conscious' (Ellis, 2005).

It is generally believed that the most acceptable definition of implicit and explicit knowledge was proposed by Ellis (2005). According to Ellis (2005), implicit knowledge is the procedural knowledge that can be accessed automatically through input, and it cannot be verbalised. Further, implicit knowledge can be easily and rapidly accessed in unplanned language use (Bowles, 2011). In contrast, explicit knowledge is declarative, and it can only be accessed through attentional learning. Ellis (1995) also maintains that, unlike implicit knowledge, explicit knowledge could be verbalised. Previous studies also show that explicit knowledge is learnable, and it can be learnt at any age (Bialystok, 1979). However, the ability to learn implicit knowledge is constrained by age and some of the linguistic features are easier to learn than others (Birdsong, 2006).

Another important debate concerning implicit and explicit knowledge systems are related or whether the two types of knowledge are separate entities. Krashen (1981) maintains that they are two separate entities. Paradis (1994) also viewed the two types of knowledge as separate systems. Paradis (1994) suggests that bilinguals with aphasia gradually lose the ability to use their L1 while maintaining the ability to converse in their L2. According to Paradis (1994), this provides evidence to believe that two types of knowledge are separate systems.

Ullman (2001) maintains that regular and irregular morphological forms are processed differently. He suggests that implicit knowledge allows us to process regular morphological forms, whereas irregular forms are processed by accessing explicit knowledge. Therefore, he also believes that two types of knowledge are two separate systems. However, some scholars have viewed explicit and implicit knowledge as continuous rather than dichotomous (Ellis, 2005).

Bialystok (1982) also points out the two types of knowledge are linked as second language (L2) learners draw on both systems as they acquire an L2. L2 learners typically learn the implicit and explicit knowledge of the same linguistic feature (Bialystok, 1982). However, Ullman (2001) argues that it is difficult to determine whether the two knowledge systems are continuous by examining the linguistic behaviour of L2 learners. The following section examines previous studies on implicit and explicit knowledge.

2. Previous studies on implicit and explicit knowledge

In previous studies, explicit knowledge is often measured by asking L2 learners to explain a certain grammar rule when it has been violated, whereas implicit knowledge is measured by examining the use of linguistic features in speaking and writing (Sorace, 1985). Implicit and explicit measures used in the present study are explained later in the paper.

Green and Hecht (1992) tested implicit and explicit knowledge in L2 German. They recruited native German speakers who were studying at schools or universities. They collected the data via an error correction task. The results showed that the participants were able to correct 78% of ungrammatical sentences. However, in 54% of cases, they failed to explain the correct grammar rule.

Macrory and Stone (2000) looked at implicit and explicit knowledge of the French perfect tense in English-French interlanguage. The participants were recruited from schools in the UK. First, they were asked to self-report their perception on the French perfect tense. Additionally, they measured their actual knowledge of the French perfect tense via a gap-filling exercise and a written production task. They found that the students have a good explicit

understanding of the French perfect tense. However, the results suggest that their implicit knowledge is has not been fully presented in English-French interlanguage.

Hu (2002) conducted a study to determine whether Chinese-speaking L2 English learners could use explicit knowledge in spontaneous writing. He first asked the participants to complete two writing tasks, and they were followed by an error correction task and a rule-verbalization task. After completing these tasks, the participants were asked to complete yet another two writing tasks. Hu (2002) predicted that after completing the error correction task and rule-verbalization task, the learners would perform better in the second series of writing tasks. As predicted, Hu (2002) found that by increasing the explicit understanding of grammar could improve the learners' ability to use the target language spontaneously (implicit knowledge).

Elder and Ellis (2009) investigated the relationship between implicit and explicit knowledge. The researchers measured implicit knowledge via a timed grammaticality judgement test (timed GJT) and implicit knowledge was measured via an untimed GJT and a metalinguistic knowledge test. They found that implicit and explicit knowledge systems are positively correlated with language proficiency. Implicit knowledge correlated strongly with speaking and listening skills, whereas writing skills were more closely correlated with writing skills. They also found that implicit knowledge develops much slower than implicit knowledge.

Roehr (2008) also reports similar results by looking at explicit knowledge of L2 German. Roehr (2008) found a positive correlation between language proficiency and explicit knowledge. Renou (2001) also found that a positive correlation between listening and comprehension skills and implicit knowledge of L2 French grammar. Additionally, these researchers report that the development of implicit knowledge is much slower than the development of explicit knowledge. The next section presents that the rationale of the present study.

3. Rationale and linguistic background

Sinhala and English differ with respect to the object pronominalization. As illustrated in (1), referential object pronouns are expressed overtly in English and overtly expressed referential object pronouns are obligatory in English as shown in (2). Sinhala also has overt object pronouns as in (3b). However, additionally, it allows null object pronouns as in (3c).

1. Did you see Peter?
Yes, I saw her.
2. Did you see Peter?
*Yes, I saw \emptyset .
3. a. oyya Mala dækk-a də?
you Mala see-PST.1.SG Q
'Did you see Mala?'
- b. ow mame eyya dækk-a.
 yes I her see-PST.1.SG
'Yea, I saw her.'
- c. ow mame \emptyset dækk-a.
 yes I (her) see- PST.1.SG
'Yea, I saw (her).'

It was hypothesized that due to the cross-linguistic difference between Sinhala and English, L1-Sinhala–L2-English speakers would encounter learnability issues while acquiring object pronouns in English. Furthermore, they would not develop implicit knowledge of object pronouns in L2 English. Considering the cross-linguistic difference between Sinhala and English, I formulated the following predictions.

4. Hypotheses

Hypothesis 1: If the L1-Sinhala–L2-English speakers have explicit knowledge of object pronouns in L2 English, their performance will be target-like in explicit tests.

Hypothesis 2: If the L1-Sinhala–L2-English speakers have implicit knowledge of object pronouns in L2 English, their performance will be target-like in implicit tests.

Hypothesis 3: If the L1-Sinhala–L2-English speakers have implicit and explicit knowledge of object pronouns in L2 English, their performance will be target-like in implicit tests and explicit tests.

5. Experiment

5.1 Participants

Two groups took part in the experiment: an experimental group and a control group. In the experimental group, there were native speakers of Sinhala (hereafter L2 speakers). At the time of the data collection, they took part in an intensive English language course in Colombo, Sri Lanka. In the experimental group, there were thirteen participants. However, one participant was later excluded from the experiment, as she could not complete both experiment tasks administered to the participants. Eight English native speakers (hereafter L1 speakers) served as a control group. The L2 speakers had some exposure to English, and they were at the pre-intermediate level. The intensive language course emphasized on the communicative language teaching.

5.2 Experimental materials

The experiment included two test instruments. The data was collected via an untimed grammaticality judgement task (untimed GJT) and an oral production task. The participants started the experiment with the untimed GJT, which was followed by the oral production task.

5.3 Untimed grammaticality judgement task

Sprouse (2011) states that GJTs are used in a wide variety of linguistic domains like generative linguistic research, language acquisition research, psycholinguistic research, and classroom-based research. The GJTs can be used for a range of purposes, including to screen participants, assess language proficiency and to determine knowledge types: implicit and explicit. Ionin and Zyzik (2014) state that one of the main concerns about GJTs is that they are not natural. In other words, the tokens tested in GJTs do not reflect the real-world use of the target language. According to the authors, another concern about GJTs is that they may only tap into learners' explicit knowledge. However, some researchers have used timed GJTs and audio GJTs to measure implicit knowledge of nonnative speakers (Ellis, 2005; Murphy, 1997). Further, judgement data is important as they allow us to understand what structures are allowed and disallowed by native and nonnative speakers (Marsden et al., 2018; Ionin & Zyzik, 2014; Schütze & Sprouse, 2014). Most importantly, GJTs can be used to test syntactic structures that are rare in spontaneous speech (Loewen, 2009). In this study, an untimed GJT was used to measure explicit knowledge of object pronouns in English.

The untimed GJT included thirty experimental tokens and twenty fillers. The thirty experimental tokens were divided equally (15 grammatical and 15 ungrammatical). The untimed GJT tested the grammaticality contrast between S-V-ObjPro and *S-V- \emptyset . The grammatical tokens focused on the S-V-ObjPro structure as in (4b), whereas the ungrammatical tokens tested the *S-V- \emptyset structure as in (5b). Twenty fillers were divided equally (10 grammatical and 10). Each experimental token and filler consisted of a two-person short dialogue in English (as in 4 and 5). The subjects were asked to judge the acceptability of the statements given by the second person in the dialogues. The judgments of the participants were measured on a five-point Likert scale of -2 to +2 where -2 means completely unacceptable, and 2 means perfectly acceptable.

4. a. Can you talk to Peter today?
 b. Yes, I will talk to him today. S-V-ObjPro
5. a.. As in (9), Question
 b. * Yes, I will talk today. *S-V- \emptyset

5.4 Oral Production task

Turning to production data, Schachter, Tyson and Diffley (1976) showed the importance of production data in second language research. They state that production data helps us to understand what learners do not know and their sensitivity to different syntactic structures. Selinker (1974) states that researchers need to consider production data as they come from observable and real-life situations. Myles (2005) argues that the language produced by L2 learners, despite processing and parsing difficulties, shows the most directly the state of learners' interlanguage. There are two types of production data: oral and written (Indrarathne, Ratajczak & Kormos, 2018). In the present study, I focus the oral production data as elicited oral data allows for more spontaneous data than written. In oral production tasks, the participants have less opportunity to reflect on learnt linguistic knowledge. Therefore, the oral production data is used to measure implicit knowledge of object pronouns in English.

In the oral production task, the participants were asked to do a role play with the researcher. The researcher posed questions to the participants (as in Figure 1), and they had to answer the questions by looking at pictures. For each question, the participants were shown different pictures. The total number of tokens was ten. The fillers were not included in the task. The researcher audio recorded the answers, and later the answers were transcribed.

Figure 1: Oral Production Task Token



6. Every day, John does the dishes after dinner. **What does he do with the plates?**

6. Results

6.1 Untimed grammaticality judgement task

As noted previously, the untimed GJT tested the grammaticality contrast between two conditions: S-V-ObjPro and *S-V- \emptyset (grammatical vs ungrammatical). In the untimed GJT, the judgments of the participants were measured on a five-point Likert scale of -2 to +2. The endpoints were defined as completely unacceptable and perfectly acceptable. The descriptive statistics are reported in Table 1. The native speakers showed a strong distinction between the grammatical (S-V-ObjPro) and ungrammatical (*S-V- \emptyset) conditions. They had a high mean rating for the grammatical structure (M=1.92, SD= 0.30), and a low mean rating for the ungrammatical structure (M= -1.80, SD= 0.33). The paired sample *t*-test was conducted for the two conditions. The result was statistically significant ($t(7)=24.1, p=001$).

In contrast to the native speakers, the nonnative speakers did not demonstrate a strong differentiation between the grammatical and ungrammatical conditions. They attributed a relatively low mean rating to the grammatical condition (M=1.50, SD= 0.55), while their mean rating for the ungrammatical structure was high (M=0.40, SD= 0.70). The paired sample *t*-test was conducted for the two conditions, and the results were statistically significant for the two structures ($t(11)=1.24, p=.001$). This suggests that like the native speakers, the nonnative speakers have also make a distinction between the grammatical and ungrammatical conditions.

Table 1. Audio AJT mean ratings on S-V-ObjPro versus *S-V- \emptyset (scale = -2-+2)

Group	Word order	Mean	SD
L1 English	S-V-ObjPro	1.92	0.30
	*S-V- \emptyset	-1.80	0.33
L2 English	S-V-ObjPro	1.50	0.55
	*S-V- \emptyset	0.40	0.72

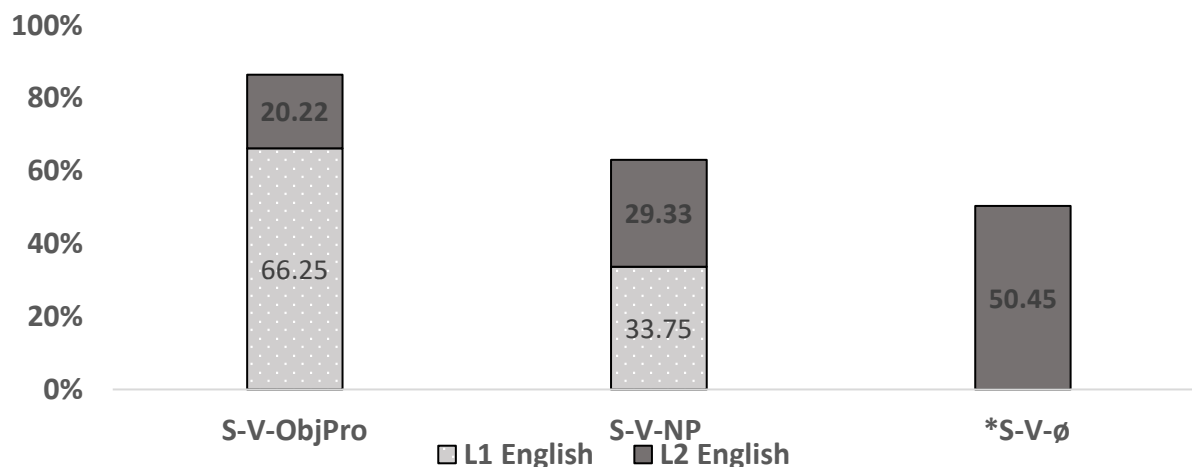
6.2 Oral production task

The oral production task results are reported in Table 2. The data given in Table 2 are further illustrated in Figure 2. The response pattern of the non-native speakers included three structures: S-V-ObjPro, S-V-NP and *S-V- \emptyset . As expected, the native English speakers did not use the ungrammatical structure. Furthermore, the native group has 66.25% use of object pronoun structures, suggesting their strong preference for that structure. The non-native group looks very different from the native group (see Figure 2). The non-native group has only 22.22% use of S-V-ObjPro structures in their responses. Interestingly, the non-native speakers predominantly used ungrammatical *S-V- \emptyset structure (50.45%) in their production. Following Rogers (2009), I suggest that they used null object pronouns at above chance level. The L2 speakers also used full NPs (29.33%) in their responses. However, they used this structure less frequently than the English native speakers (33.77%). The following section discusses the results in relation to the hypotheses.

Table 2. S-V-ObjPro, S-V-NP and *S-V- \emptyset choices in percentages

	L1 English	L2 English
S-V-ObjPro	66.25	20.22
S-V-NP	33.75	29.33
*S-V- \emptyset	00.00	50.45

Figure 2. Percentage of each structure produced by groups



7. Discussion

In this section, the results detailed in the previous section will be discussed in light of the hypotheses and then I will conclude which hypothesis is compatible with the results. As noted previously, the present study tested three hypotheses. Hypothesis 1 states that if the L2 English speakers have explicit knowledge of object pronouns in L2 English, their performance will be target-like in explicit tests. In the present study, explicit knowledge was measured by the untimed AJT. In the AJT, the native speakers made a stark differentiation between the grammatical and ungrammatical conditions. The L2 differentiation between the grammatical and ungrammatical conditions is relatively smaller. However, like the native speakers, the nonnative speakers made a statistically significant distinction between the grammatical and ungrammatical conditions. Therefore, the results are compatible with Hypothesis 1 and it suggest that explicit knowledge of object pronouns are available in English-Sinhala interlanguage.

Hypothesis 2 states that if the L2-English speakers have implicit knowledge of object pronouns in L2 English, their performance will be target-like in implicit tests. As noted previously, in the present study, implicit knowledge was measured by the oral production task. The native speakers predominately used the S-V-ObjPro structure in the production task. However, the L2 speakers look very different from the native English group. They used the ungrammatical structure *S-V-ø more frequently than any other structures. With over 50% use of the *S-V-ø structure, the L2 English speakers showed that they were not target-like on object pronouns in the oral production task. Moreover, their linguistic behavior in the production task suggests non-facilitative transfer from their L1. Therefore, the oral production task results do not support Hypothesis 2.

Turning to Hypothesis 3, it states that if the L2-English speakers have implicit and explicit knowledge of object pronouns in L2 English, their performance will be target-like in implicit tests and explicit tests. As discussed previously, the L2 speakers were target-like on object pronouns in the untimed GJT, whereas their performance in the production task clearly diverts from the native norms. Therefore, Hypothesis 3 is not supported by the results.

It is widely accepted that implicit and explicit knowledge is important to grammar development in L2 acquisition (Ellis, 2005, 2008; 2009, 2011). Further, the two types of knowledge also contribute to the L2 proficiency (Ellis, 2005, 2011). The overall results of the present study suggest that implicit knowledge of object pronouns in L2 English is readily available for L2 speakers. However, the experiment shows that spontaneous production of object pronouns is problematic for the L2 speakers. Therefore, the findings suggest that the L2 speakers cannot access implicit knowledge of object pronouns in English.

The present study is not exempt from limitations. The way the explicit and implicit knowledge was measured could have been improved. The study could have benefited from having additional implicit and explicit measures. For example, for measuring explicit knowledge, a metalinguistic knowledge test could have been used additionally. With respect to measuring implicit knowledge, the experiment could have benefited from a self-paced reading task.

8. Conclusion

The present study was designed to measure implicit and explicit knowledge of object pronouns in L2 English. In line with previous research, it was hypothesized that the L2 English speakers would develop implicit knowledge much slower than explicit knowledge. As predicted, the L2 English speakers were target-like on adverb placement in the explicit test (untimed GJT), whereas in the implicit task (the oral production task), due to detrimental L1 transfer, their performance was not target-like. Therefore, the results suggest that implicit knowledge of object pronouns is still unavailable in L1-Sinhala–L2-English interlanguage.

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