

Representations of Implicit and Explicit Knowledge in Chinese Learners of Portuguese as a Foreign Language—The Case of the Verbs *Ser* and *Estar*

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Abstract

This study focuses on the comparison of representations of implicit and explicit knowledge in Portuguese learners of Chinese as a foreign language, aiming at investigating the role of explicit instruction of the verbs *ser* and *estar*. Based on theoretical concepts of implicit and explicit knowledge and the Interface Hypothesis, two groups of Chinese students (one of which is at the initial level of proficiency and the other is at the advanced level of proficiency) participated in our study. They were assessed at the level of their knowledge of the uses of the verbs *ser* and *estar*. In order to do this, we used the Timed Grammaticality Judgment Test (TGJT) and the Untimed Grammaticality Judgment Test (UGJT). The results indicate that explicit instruction plays a positive role in developing implicit knowledge of the verb *ser* and *estar*, and contributes to the increase of explicit knowledge and facilitates the acquisition of implicit knowledge of both the verbs *ser* and *estar*. With explicit instruction, the students with higher proficiency develop more explicit knowledge. However, for the implicit knowledge, there is no obvious change among students in both proficiency levels. Chinese students have many difficulties when the copula acts as the location and allocation functions. In addition, the students with lower proficiency have more difficulties when the copula assumes the allocation function. The research can help us recognize the importance of explicit instruction of verbs in the second and foreign language acquisition, especially in the case of the verbs *ser* and *estar* for Chinese-speaking learners, and can contribute to a better understanding of the foreign language acquisition process.

Keywords

Foreign language acquisition; Implicit and explicit knowledge; Explicit instruction; Verbs *ser* and *estar*; Timed GJT and untimed GJT

1. Introduction

In the field of applied linguistics studies, implicit and explicit knowledge are important research topics because both types of knowledge play a significant role in Second and Foreign Language Acquisition. Although there are many studies focused on explicit and implicit knowledge (Roehr-Brackin, 2024; Ellis, 2021; Rebuschat, 2013; Lichtman,

2013; Preuss, 2008; Ellis, 2005; Williams, 2005), no consensus has yet been reached regarding the relationship between implicit and explicit knowledge.

1.1 Implicit and Explicit Knowledge

One of the first models to address implicit and explicit knowledge was presented by Krashen (1982; 1985). He proposes the Monitor Model, which considers that acquisition and learning are two distinct processes. Explicit knowledge is defined as the conscious, declarative knowledge that is accessed through a controlled process and can be verbalized. In contrast, implicit knowledge is defined as intuitive, procedural knowledge that is accessed through automatic processes and cannot be verbalized. They originate from two independent processing systems, namely learning and acquisition. According to Krashen (1982; 1985), learning is processed consciously, while acquisition is a subconscious-level process.

Regarding their role in second language learning and acquisition, implicit knowledge is generally considered core to the development of the SLA process (Rebuschat, 2013; Gutiérrez, 2012). Since explicit instruction aims to direct learners' attention to linguistic structures present in the input and contribute to the development of explicit knowledge, it consequently enhances the learning process and promotes language acquisition. Zimmer and Alves (2012) expand the definition of explicit instruction and argue that, beyond rule systematization work, all pedagogical procedures applied by teachers to draw learners' attention can be considered explicit instruction.

With respect to the relationship between implicit and explicit knowledge, there are many approaches discussing different degrees of interaction between the two types of knowledge. The non-interface hypothesis (Hulstijn, 2002; Krashen, 1982 & 1985; Paradis, 1994) considers that the two have no connection. The strong interface hypothesis (Sharwood, 1981; Dekeyser, 1998; Logan, 1998) argues that the two types of knowledge are complementary. And the weak interface hypothesis (R.Ellis, 1993; N.C.Ellis, 1994; Schmidt & Frota, 1986; Sharwood, 1981) maintains that explicit knowledge facilitates implicit knowledge. According to these hypotheses, explicit instruction plays a very important role in the SLA process.

These interface perspectives have been debated for decades, but no conclusion has yet been reached about which hypothesis is most reasonable and convincing.

1.2 The Verbs *Ser* and *Estar*

In Portuguese, the copular verbs *ser* and *estar* serve four functions: identification, classification, attribution/qualification, and localization (Oliveira et al., 2007). Moreover, there is a crucial usage distinction between *ser* and *estar*. For Chinese native speakers, the difficulty and confusion likely stem from the fact that in Chinese, there is no exact equivalent verb that can fully describe or replace the meaning and usage of *ser* and *estar* in Portuguese. That is, in some cases we need to use *ser* or *estar* separately in Portuguese, but in Chinese we only use the same verb or even no verb at all. In other cases, although we use the same verb in Portuguese, in Chinese, different verbs are required depending on the context.

2. Methodology

The present study aims to observe and analyze representations of explicit and implicit knowledge, and discuss the importance of explicit instruction in foreign language learning, particularly the verbs *ser* and *estar* for Chinese learners whose native language (L1) lacks this distinction, seeking to contribute to a better understanding of the processes of foreign language acquisition. More specifically, the study attempts to address the following research questions:

- (1) To what extent does explicit instruction affect the development of implicit knowledge in L2 verb acquisition?
- (2) How do implicit and explicit knowledge representations vary across different proficiency levels if such instructional effects are observed?

2.1 Participants

For our study, data were collected from 144 participants in total. All of them were Chinese native speakers enrolled in Portuguese courses and had received explicit instruction on *ser* and *estar*. Among them, 87 students had studied Portuguese for one semester (equivalent to beginner proficiency level), while others had studied Portuguese for seven semesters (equivalent to advanced proficiency level).

2.2 Instruments and Procedures

Ellis (2005), Gutiérrez (2013), Rebuschat (2013), Ellis et al. (2021), Ono (2022), and Brackin (2024) propose various methods to separately measure implicit and explicit knowledge. Of these, the timed grammaticality judgment test (TGJT) is an effective method for measuring implicit knowledge, and the untimed grammaticality judgment test (UGJT) is one important method for measuring explicit knowledge. According to Ellis (2005) and Gutiérrez (2013), data from grammatical and ungrammatical sentences should be analyzed separately in the two grammaticality tests. The current study employed TGJT and UGJT as data collection instruments. Before the tests, participants completed a personal information form including their years of learning.

The TGJT contained 64 sentences—half grammatical and half ungrammatical. The 64 sentences covered contexts of *ser* and *estar* that had been explicitly taught. That is, 32 were grammatical sentences (16 with *estar* and 16 with *ser*) and 32 were ungrammatical (16 with *estar* and 16 with *ser*). The sentences were displayed via PPT with 6-9 second intervals (following Gutiérrez 2012, 2013). The participants judged whether sentences were grammatical and recorded responses on answer sheets. The UGJT contained the same 64 sentences as TGJT. The participants wrote responses on the provided answer sheets.

The responses to the TGJT and UGJT were scored in terms of correct and incorrect answers. Each correct response received 1 point, while an incorrect response gained 0 points. That is, if a participant judged a grammatical sentence as ungrammatical, it was scored 0. If judged correctly, 1 point was given. There were also blank responses when participants were uncertain about grammaticality or lacked sufficient time to respond. Missing responses were coded as 99 points.

3. Results

The present study aimed to (a) observe measured representations of implicit and explicit knowledge (Research Question 1), and (b) if the differences were verified, examine potential associations between implicit and explicit knowledge and proficiency levels (Research Question 2). To address these questions, we analyzed three variable types: (i) sentence stimuli (64 items with *ser* and *estar*), (ii) testing conditions (TGJT and UGJT), and (iii) proficiency levels. Following Ellis (2005) and Gutiérrez (2012, 2013), these variables were operationalized in SPSS.

According to Martins (2011), all variables of the study were classified as nominal. Consequently, in accordance with standard analytical procedures for nominal data, we implemented descriptive statistics (frequency distributions) and chi-square tests of association.

The reliability of TGJT and UGJT was calculated using Cronbach's alpha. Table 1 shows reliability coefficients. Cronbach's alpha was .778 for timed GJT and .810 for untimed GJT, indicating the two tests were reliable (DeVellis, 1991).

Table 1. Reliability coefficients for the tests

Test	Items	Participants	Reliability coefficient
TGJT	64	144	$\alpha = .778$
UGJT	64	144	$\alpha = .810$

According to Ellis (2005) and Gutiérrez (2013), for a more detailed analysis, the sentences were divided into four groups: grammatical *ser* sentences, ungrammatical *ser* sentences, grammatical *estar* sentences, and ungrammatical *estar* sentences.

To address Research Question 1, we used frequency to analyze the data. As summarized in Table 2, the accuracy rates were higher in the UGJT than in the TGJT, with an 8% difference. Across all four sentence types, the accuracy values in the UGJT were also higher than those in the TGJT, though the disparity did not exceed 6%. We therefore conclude that there is a difference between representations in UGJT and TGJT, though not substantial. Since the UGJT measures explicit knowledge, whereas the TGJT measures implicit knowledge, these results indicate a

general difference between measured implicit and explicit knowledge, though not marked. This finding supports the Weak Interface Hypothesis. That is, explicit instruction can increase explicit knowledge and appears to facilitate implicit knowledge acquisition.

Table 2. Accuracy rates (%) for *ser* and *estar* sentences in TGJT and UGJT

Sentence Type	TGJT	UGJT
Grammatical <i>ser</i>	83.3	86.5
Ungrammatical <i>ser</i>	64.1	65.2
Grammatical <i>estar</i>	81.3	81.8
Ungrammatical <i>estar</i>	79.7	85.2
Total	72.0	80.0

Additionally, for the ungrammatical sentences, the accuracy rates were relatively lower in TGJT than in the grammatical sentences. This pattern did not appear in UGJT. Loewen (2009) and Gutiérrez (2013) showed similar findings.

Table 3. Difficulties in grammatical/ungrammatical sentences by semantic function

Sentence Type	Identification	Classification	Attribution/Qualification	Localization
Grammatical <i>ser</i>	No	No	No	Yes
Ungrammatical <i>ser</i>	No	No	Yes	No
Grammatical <i>estar</i>	No	No	Yes	No
Ungrammatical <i>estar</i>	No	No	Yes	No

In terms of semantics (Table 3), the four sentence groups revealed that the Chinese learners showed more difficulty in identification and acquisition when *ser* and *estar* functioned in localization and attribution/qualification. These findings can be explained by cross-linguistic differences in copular verb usage. Specifically, Portuguese maintains a crucial distinction between *ser* and *estar* in localization and attribution/qualification functions, whereas Chinese lacks this distinction and may even omit copular verbs when adjectives function as predicates.

By proficiency level (Table 4), advanced learners showed higher accuracy than beginners, with a difference of 5.9%. To four groups of sentences, it also has the same result, that is, the advanced learners outperformed the beginners. In addition, when *ser* and *estar* function in attribution or qualification, there is a relatively more obvious difference between beginners and advanced learners in grammatical sentences. However, is this difference related to proficiency?

To answer Research Question 2, we used the chi-square test to examine the association between implicit and explicit knowledge representations and proficiency.

Table 4. Accuracy rates (%) for *ser* and *estar* sentences by proficiency level

Sentence Type	Beginner	Advanced
Grammatical <i>ser</i>	83	87.7
Ungrammatical <i>ser</i>	63.5	69.0
Grammatical <i>estar</i>	77.2	80.7
Ungrammatical <i>estar</i>	79.0	87.7
Total	75.4	81.3

Table 5. Association existence with the proficiency level

Sentence Type	Association Exists
Grammatical <i>ser</i>	No
Ungrammatical <i>ser</i>	Yes
Grammatical <i>estar</i>	No
Ungrammatical <i>estar</i>	Yes

The results summarized in Table 5 indicate that associations with proficiency existed mainly for ungrammatical sentences, while most grammatical sentences showed no association. Thus, for grammatical sentences, the beginner and advanced learners demonstrated similar difficulty levels in identifying correct forms.

Table 6. Accuracy rates for ungrammatical *ser* and *estar* sentences by proficiency

Sentence Type	Beginner	Advanced
Ungrammatical <i>ser</i>	63.5	69.0
Ungrammatical <i>estar</i>	79.0	87.7

According to Table 6, the beginners showed more difficulty identifying correct forms in ungrammatical sentences. Based on Krashen's Monitor Hypothesis (1982, 1985), the participants tend to use explicit knowledge when judging ungrammatical sentences and use implicit knowledge to identify grammatical sentences. Therefore, the results suggest that, with explicit instruction, higher-proficiency learners develop more explicit knowledge. However, for implicit knowledge, there is no obvious difference between the two proficiency levels.

4. Discussion

Explicit and implicit knowledge are central and constant research topics in applied linguistics and L2 acquisition (Gutiérrez, 2002). Although there are many studies focusing on explicit and implicit knowledge, there has not yet been a consensus on their relationship. Our study aims to discuss the role of explicit instruction for the verbs *ser* and *estar* in foreign language learning, by observing and analyzing implicit/explicit knowledge representations. The

results indicate that explicit instruction can contribute to increasing explicit knowledge and appears to positively influence implicit knowledge development for *ser* and *estar*, corresponding to the Weak Interface Hypothesis. Semantically, the distinction of usage between copular verbs in Chinese and Portuguese may be a factor influencing learning and acquisition. Moreover, there is an association between implicit and explicit knowledge and proficiency for ungrammatical sentences. Following Krashen's Monitor Hypothesis (1982; 1985), the results suggest that higher-proficiency learners develop more explicit knowledge with explicit instruction. However, for implicit knowledge, there is no obvious difference between students in the two proficiency levels. Certainly, the study has limitations. For instance, it only verified the role of explicit instruction; it did not assess implicit instruction on the explicit and implicit knowledge. Additionally, no perfect methodology exists for measuring implicit and explicit knowledge. Future research could employ more data collection instruments for clearer results and expand our knowledge on foreign language acquisition processes.

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