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Cognitive demands of oral corrective feedback: Comparing recast and elicitation in L2 Japanese

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Abstract

This study examines the relationship between memory systems and second language acquisition, with a focus on the roles of working memory and long-term memory in the encoding, storage, and retrieval of linguistic knowledge. A pilot experiment investigated the effectiveness of two types of oral corrective feedback, recast and elicitation, in facilitating L2 Japanese development. In a U.S. higher education setting, 25 learners of Japanese (12 advanced and 13 intermediate) participated in one-on-one conversational sessions targeting common linguistic errors. The study addressed two research questions: (1) Which feedback type, recast or elicitation, more effectively prompts error correction? and (2) Do advanced learners outperform intermediate learners, and how does proficiency level interact with feedback type? Results showed that elicitation was significantly more effective than recast, particularly for advanced learners, likely due to its greater cognitive demands, which promote deeper processing and active problem-solving. Questionnaire responses indicated that learners valued opportunities for self-correction and preferred more interactive forms of feedback, consistent with the observed effectiveness of elicitation. These findings contribute to our understanding of the cognitive mechanisms underlying language learning and underscore the importance of tailoring feedback strategies to learners' proficiency levels.

Keywords: Cognitive processing, L2 Japanese, long-term memory, oral corrective feedback, second language acquisition working memory

Introduction

Language learning is a complex cognitive process involving the encoding, storage, and retrieval of linguistic information, with learners progressing through three primary stages of memory: sensory, working, and long-term memory (Benati & Angelovska, 2016; Pfenninger et al., 2023). These memory systems are essential to language acquisition, yet much existing research has

focused on strategies for improving language processing and recall rather than examining how different types of oral corrective feedback (OCF) interact with cognitive processing at each memory stage. The acquisition process begins with the perception of linguistic input via sensory memory, followed by active manipulation in working memory, and eventual consolidation into long-term memory for future retrieval. The effectiveness of this process is influenced by factors such as feedback type and timing. As a central pedagogical tool, OCF shapes cognitive engagement by drawing learners' attention to linguistic errors and promoting deeper processing. Different feedback types, such as recast and elicitation, may engage these cognitive mechanisms in distinct ways, thereby influencing how language forms are encoded, retained, and accessed. Although prior studies (e.g., Ellis, 2009; Long, 2017; Nassaji, 2016; Sheen, 2004) have advanced our understanding of OCF's role in improving linguistic accuracy, fewer have explored its impact on the underlying cognitive processes involved in memory and learning. This study investigates how OCF influences transitions within and between memory stages, aiming to contribute insights that can enhance the pedagogical application of feedback. By integrating perspectives from cognitive science and second language acquisition, this research seeks to inform classroom practices by identifying feedback strategies that support both cognitive development and linguistic accuracy across varied instructional contexts.

Literature Review

Types of Memory Systems

Understanding information processing is essential for explaining cognitive functions, including language learning. Information processing theory explores how information flows through neural and motor systems, influencing cognitive functioning, knowledge acquisition, and behavior (Vickers, 2007). Foundational models such as George A. Miller's information processing framework and Atkinson and Shiffrin's (1968) multi-store model of memory underpin modern cognitive psychology (Lord, 2022). These theories conceptualize human information processing similarly to computer operations. As Shaffer and Kipp (2010) describe, "the human mind is like a computer into which information flows, is operated on, and is converted to output" (p. 57). Yet, human cognition is far more complex, shaped by factors like emotion, motivation, and sensory perception.

According to Ernst and Myers (2003), the information processing model views memory as a three-stage system: encoding (input), storage (retention), and retrieval (access). This process is analogous to how a computer handles data: text is entered via a keyboard, processed by the central processing unit (CPU), stored on a hard drive, and later retrieved to display on a screen or print, as illustrated in Figure 1.

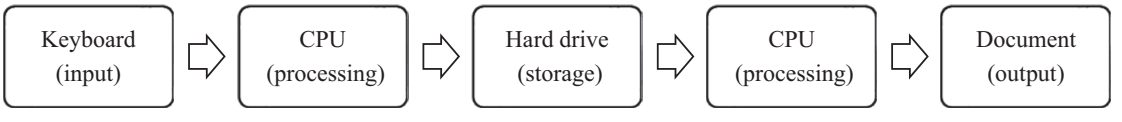

Figure 1. *Information processing stages in a computer*

This process mirrors how human memory operates, as illustrated in Figure 2. Memory is not a single system but consists of distinct stages, beginning with sensory memory, which temporarily holds incoming stimuli from the environment (e.g., visual, auditory). Information that receives focused attention is transferred to working memory, where it can be actively manipulated for

ongoing tasks (Hulme & Mackenzie, 2014). This stage is especially important for language learning, as it supports activities such as practicing vocabulary or analyzing grammatical structures.

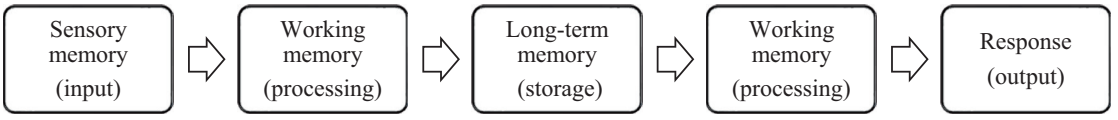

Figure 2. *Information processing stages in human memory*

Working memory is characterized by limited capacity, which can present challenges when learners encounter complex linguistic input or attempt to hold multiple pieces of information simultaneously. Effective language learning often requires transferring information from working memory into long-term memory through active engagement and rehearsal (Berger, 2006; González-Burgos & Feria-Velasco, 2008; Halls, 2014; Wong, 2015). The role of working memory in language acquisition is well established. Alloway (2011) states that working memory is a strong predictor of academic achievement, as it governs how efficiently learners process, manipulate, and retain new information. This view is supported by a range of studies (e.g., Daneman & Hannon, 2007; Engle, 2001; Manto et al., 2022; Wen et al., 2015), which highlight its central role in language learning outcomes. When information remains in working memory only briefly and is not rehearsed or encoded, it risks being forgotten before reaching long-term storage. In such cases, output may be produced directly from working memory, increasing the likelihood of inaccuracy.

In contrast, long-term memory has vast capacity and enables information to be stored over extended periods, ranging from hours to years. Once information is encoded into long-term memory, it becomes available for retrieval in learning, problem-solving, and language production. However, not all long-term memories are equally accessible. Factors such as frequency of rehearsal, emotional salience, and recency of exposure influence how easily information can be recalled. While sensory memory is fleeting and working memory is temporary, long-term memory enables the retention of language knowledge necessary for fluent communication. Working memory plays a critical role in the transition to long-term memory. Numerous studies (e.g., Baddeley, 2002; Cox, 2002; Davey et al., 2012; Dehn, 2008; Goldstein, 2014; Hayes, 2000; Hummel, 2021) emphasize that successful encoding requires active mental engagement, repetition, and meaningful processing. Without such cognitive effort, information is unlikely to be retained. This highlights the importance of repeated exposure and practice in language learning settings. Finally, retrieval, the process of accessing information stored in long-term memory, returns that knowledge to working memory, where it can be used actively. Retrieval is essential for language production, enabling learners to recall words and structures in real time during speaking or writing tasks. It also strengthens memory traces through use. Retrieval-based learning strategies such as spaced repetition and testing have been shown to enhance long-term retention and promote fluent language use.

Two Systems of Long-Term Memory

Language learning relies heavily on long-term memory, the repository for linguistic knowledge, which consists of two primary subsystems: declarative and procedural memory (Anderson, 1983; Baddeley, 2002; Brown, 2014). These systems differ in the types of information

they store and in how that information is accessed and applied. Declarative memory stores factual knowledge that can be consciously recalled and verbalized. In the context of language learning, this includes explicit knowledge of grammatical rules, vocabulary, and other linguistic facts. For example, a learner might consciously recall the rule for pluralization in English (e.g., adding "-s") or produce a formulaic phrase such as "How are you?" Declarative memory enables learners to apply learned rules intentionally during language use.

In contrast, procedural memory stores knowledge of skills and routines that are performed automatically and typically without conscious awareness. In language acquisition, this includes the ability to produce grammatically accurate sentences and to engage in fluent communication. Through repeated practice, these skills become automated. For instance, a learner who regularly practices plural forms in communicative contexts will eventually apply the rule correctly and effortlessly in conversation (DeKeyser, 1998). Procedural knowledge is acquired through extensive practice and is difficult to articulate explicitly.

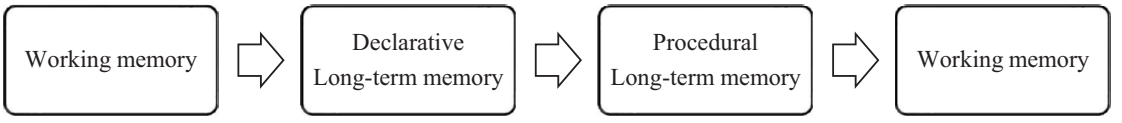

Figure 3. *Flow of information between working memory and long-term memory systems*

Figure 3 illustrates the flow of information between working memory and the two subsystems of long-term memory. Working memory acts as a temporary workspace for processing information before it is encoded into long-term storage, where the nature of the material determines whether it is stored in declarative or procedural memory. This distinction explains why some aspects of language, such as vocabulary or grammatical rules, remain accessible to conscious recall, whereas others, such as fluency or pronunciation, become automatic through repeated exposure and use. The transition from declarative to procedural memory is central to achieving spontaneous and accurate language use, a key component of fluency (Carr & Shotwell, 2007; Doughty & Williams, 1998; Lyster, 2004; Talsma, 2023). Learners often start by consciously applying declarative knowledge to construct sentences or use grammatical rules. However, through consistent practice and corrective feedback, this knowledge becomes proceduralized, resulting in more natural and fluent performance. OCF plays a critical role in this transformation. The output-prompting nature of elicitation encourages learners to engage in repeated practice, supporting the conversion of declarative knowledge into procedural skills, while the input-providing aspect of recast aids the initial encoding of information into declarative memory. Effective encoding from working memory into long-term memory is essential for this process. Together, these mechanisms suggest that targeted feedback can support both memory systems and foster long-term language development.

Types of Oral Corrective Feedback

OCF strategies are commonly categorized along two primary dimensions: explicit versus implicit and input-providing versus output-prompting (Hall, 2016; Nadif & Bidari, 2023; Nassaji & Kartchava, 2017; Porayska-Pomsta & Pain, 2004; Rkiki et al., 2025). Explicit feedback directly identifies the learner's error, while implicit feedback signals the presence of an error without explicitly pointing it out. Input-providing feedback supplies the correct linguistic form, whereas output-prompting feedback encourages learners to self-correct. As summarized in

Table 1, understanding these distinctions is crucial for grasping how different feedback types impact second language acquisition through distinct cognitive pathways.

Table 1. *Types of oral corrective feedback and their definitions*

Explicit correction (explicit/input-providing): The teacher provides the correct form, indicating the learner's error.
Metalinguistic feedback (explicit/output-prompting): The teacher comments on the well-formedness of the learner's utterance.
Clarification request (implicit/output-prompting): The teacher asks for clarification without indicating the error.
Repetition (implicit/output-prompting): The teacher repeats the learner's utterance, including errors.
Elicitation (implicit/output-prompting): The teacher prompts the learner to reformulate the incorrect utterance.
Recast (implicit/input-providing): The teacher reformulates the learner's utterance, correcting errors.

Note. Definitions are adapted from Lyster and Ranta (1997).

Among various feedback types, explicit correction may be less effective for promoting deep language development, as it often leads to superficial repetition rather than meaningful internalization. This type of feedback tends to support declarative knowledge only, without fostering the deeper cognitive processing required for proceduralization. A similar limitation applies to repetition, which draws attention to errors without necessarily encouraging self-correction or restructuring. This study focuses on two specific implicit feedback strategies: recast and elicitation, chosen for their widespread classroom use and distinct but complementary roles in language development (Fathimah, 2020; Havranek, 2002; Lyster & Ranta, 1997; Penning de Vries et al., 2011). Recast supports declarative knowledge acquisition by providing corrected input within a meaningful communicative context, allowing learners to notice the correct form and integrate it with existing knowledge. In contrast, elicitation is particularly effective in refining control over forms that learners have already internalized; by requiring learners to retrieve and produce the correct form themselves, elicitation supports the transition from declarative to procedural knowledge and promotes automatization of language use. The next section presents examples of both recast and elicitation, emphasizing the types of learner responses they elicit.

Recast and Elicitation: Cognitive Impact and Memory Systems

Recast is a form of implicit feedback that provides the correct version of a learner's error without explicitly interrupting the flow of conversation. In this approach, the teacher subtly reformulates the learner's incorrect utterance by incorporating the correct form without directly highlighting the mistake. If learners notice this feedback, the immediate correction can facilitate recognition of the discrepancy and integration of the correct form (Krashen, 1994). Recast primarily supports declarative knowledge acquisition by supplying explicit forms for internalization, as illustrated below (L = Learner, T = Teacher).

Example A-1
L: I major on English.
T: You major in English.
L: Yes, I major in English.

In Example A-1, the learner immediately notices and corrects the error, indicating that the recast facilitated the encoding of the correct form into declarative memory. As Gass (2003) notes, the close juxtaposition of correct and incorrect forms aids error recognition. Thus, recast can be effective in supporting declarative knowledge acquisition. However, this is not always the case, as shown in Example A-2.

Example A-2
L: I major on English.
T: You major in English.
L: Yes, I major on English.

In Example A-2, the learner fails to notice the correction. This illustrates that the success of recast depends on learner attentiveness and their ability to recognize and internalize the corrected form.

In contrast, elicitation is another implicit feedback type that prompts learners to self-correct through cues or questions. For instance, the teacher might pause after the error, encouraging the learner to complete the sentence. Elicitation is output-prompting, requiring learners to actively retrieve and apply the correct form. This active cognitive engagement fosters deeper processing and promotes the transition from declarative to procedural knowledge. Unlike recast, which provides the correct form, elicitation requires learners to exert cognitive effort, facilitating more durable internalization, as illustrated below.

Example B-1
L: I major on English.
T: You major…?
L: I major… in English.

As advocated by Gass and Mackey (2000), elicitation engages working memory by stimulating recall, enabling learners to identify and apply the correct form. This process strengthens the connection between declarative and procedural memory. However, success is not guaranteed, as shown in Example B-2.

Example B-2
L: I major on English.
T: You major…?
L: I major… on English.

In Example B-2, the learner struggles, potentially due to unfamiliarity or insufficient cognitive resources. This highlights that elicitation is cognitively demanding, requiring active retrieval and application. When successful, elicitation greatly supports the transition to procedural knowledge. It is particularly effective for enhancing procedural memory and encouraging spontaneous, fluent language use. By engaging learners in problem-solving, elicitation facilitates the

transfer of declarative knowledge into procedural memory, a critical step for fluent, automatic language production (Loewen, 2014).

In educational settings, elicitation can refine language production by promoting recall and application. The increased cognitive load imposed by elicitation supports deeper processing and enhances learners' ability to produce accurate forms. Repeated engagement with elicitation fosters automaticity, improving both accuracy and fluency. The differing cognitive demands of recast and elicitation may explain their varying effectiveness across learner proficiency levels. Specifically, the higher cognitive load required by elicitation may render it especially beneficial for advanced learners.

Rationale and Research Questions

Understanding the cognitive mechanisms underlying language learning is essential for optimizing instructional strategies (Ullman, 2016). Central to this understanding is the role of working memory and long-term memory in processing, storing, and retrieving linguistic information. As learners progress through stages of language acquisition, their ability to transfer knowledge from working memory, where information is temporarily held and manipulated, to long-term memory, where it is stored for later use, is critical to the development of linguistic proficiency. Encoding information into declarative memory and subsequently transitioning it into procedural memory supports learners' ability to produce language spontaneously and accurately (Anderson, 1983; Baddeley, 2002).

Input-providing learning, such as the conscious acquisition of grammatical rules, primarily involves the transfer of knowledge from working memory to declarative memory. In contrast, output-prompting learning, which includes the acquisition of language chunks or common phrases, often bypasses conscious awareness and is stored directly in long-term procedural memory. This distinction highlights the different cognitive processes involved in language acquisition and is key to understanding how OCF can facilitate transitions between memory systems, thereby enhancing learners' fluency and accuracy. Specifically, recast feedback, by providing the correct form, aligns more closely with input-driven learning, whereas elicitation, by prompting learners to produce the correct form, supports output-driven learning.

This study investigates how these two widely used OCF types influence learners' ability to correct errors and internalize language forms. Additionally, it examines how the effectiveness of recast and elicitation varies across proficiency levels by comparing the performance of intermediate and advanced learners. The findings aim to inform how feedback strategies can be optimized for different stages of language acquisition. The research questions guiding this study are:

RQ1: Which feedback type, recast or elicitation, more effectively prompts error correction?

RQ2: Do advanced learners outperform intermediate learners, and how does proficiency level interact with feedback type?

By investigating these dynamics, this study seeks to contribute valuable insights into designing more effective language teaching strategies that are sensitive to the cognitive processes involved in language learning. In particular, the findings will underscore the importance of successful encoding and storage of information in long-term memory and provide guidance for tailoring feedback to meet the specific needs of learners at different proficiency levels.

Method

Participants

Twenty-five participants took part in this study, comprising 12 advanced and 13 intermediate learners of Japanese enrolled in higher education. The inclusion of two proficiency groups aimed to explore whether learners at different proficiency levels respond differently to OCF, thereby informing tailored feedback strategies. Participants were recruited through invitations extended to students enrolled in Japanese language courses at two distinct proficiency levels. Beginning-level learners were excluded due to their insufficient linguistic competence to sustain meaningful conversations.

Potential participants were initially contacted and asked if they were willing to participate in the study. Those who expressed interest underwent a brief oral screening interview conducted by the researcher to confirm eligibility based on the following criteria: (1) voluntary willingness to participate, (2) ability to engage in conversation in Japanese, (3) acceptance of the recorded research environment, and (4) willingness to complete a post-session questionnaire. Proficiency was assessed during this interview by evaluating fluency, vocabulary range, and grammatical accuracy. Eligible participants provided written informed consent, detailing the study procedures and their rights, including the option to withdraw at any time without penalty. In accordance with Institutional Review Board regulations, participants were assigned numerical codes to maintain anonymity and confidentiality. All participants completed conversational sessions without incident and subsequently filled out a brief questionnaire designed to gather information relevant to this study, including their preferred learning activities outside the classroom, types of feedback, and classroom learning environments. These questions were selected to directly address the research questions regarding learner preferences and their potential impact on feedback effectiveness.

Design and Procedure

To standardize the conversational sessions, each participant engaged in two one-on-one conversations with the researcher, each lasting approximately 10 minutes and held one week apart. These sessions took place in a quiet, controlled private space on campus. To promote natural discourse while maintaining comparability across sessions, conversations centered on familiar topics such as holidays, trips, hobbies, and family, with consistent initial prompts (e.g., "Where have you traveled?") guiding the discussion. The researcher's role was primarily facilitative, minimizing interruptions, posing open-ended questions, and encouraging participants to speak freely.

During each session, the researcher provided OCF targeting errors related to grammar, vocabulary, and prepositions (i.e., Japanese particles), labeled as G, V, and P respectively. Errors were identified naturally within the flow of conversation. Participants received up to six instances of recast feedback in the first session and up to six instances of elicitation in the second session. This limit was set to balance the need for sufficient feedback while avoiding overwhelming participants. If more than six errors of a particular type occurred, feedback provision ceased for that session. This controlled distribution of feedback ensured that all participants received comparable exposure to each feedback type, promoting fairness and consistency in data collection. Additionally, this approach aimed to prevent excessive correction, which could inhibit natural conversation. The procedures described were applied uniformly to all participants to maintain an impartial research environment.

Sample Responses to Each Feedback Type

The following example illustrates the targeted error types and the feedback strategies employed during the conversational sessions. For clarity, interactions are presented in English, demonstrating error identification and feedback provision (R = Researcher, X = Participant X).

R: What are your favorite things to do?
X: I love to travel because it's so many fun! (Vocabulary error)
R: Because it's so…? (Elicitation)
X: It's so much fun! (Error corrected)
R: Where have you traveled?
X: I have been on England. (Preposition error)
R: You have been to England. (Recast)
X: Yes, I have been to England. (Error corrected)
R: Why did you go there?
X: That's what I always wanted to go. (Vocabulary error)
R: Oh, that's where you always wanted to go. (Recast)
X: Yes, that's what I always wanted to go. (Error not corrected)
R: How long did you stay there?
X: I stayed there for two week. (Grammar error)
R: You stayed there for two…? (Elicitation)
X: I stayed there for two… week. (Error not corrected)

In this example, Participant X corrected 50% of errors following both recast (1 out of 2 instances) and elicitation (1 out of 2 instances). The correction rate was calculated based on the number of instances where participants immediately self-repaired after receiving feedback.

Results

This study investigated the effectiveness of two types of OCF, recast and elicitation, in facilitating error correction among Japanese language learners. Table 2 summarizes individual participants' repair rates for each feedback type, along with the number of feedback instances they received.

Table 2. *Individual participant repair rates for recast and elicitation, with feedback frequency*

Participant	Repair rate for recast	Repair rate for elicitation	No. of recast received	No. of elicitation received
1	100%	100%	4	5
2	33.33%	100%	6	5
3	100%	100%	5	4
4	0%	100%	4	5
5	50%	100%	6	6

(*Continued*)

Participant	Repair rate for recast	Repair rate for elicitation	No. of recast received	No. of elicitation received
6	0%	0%	5	6
7	50%	100%	4	4
8	33.33%	100%	6	6
9	50%	100%	6	6
10	33.33%	50%	6	4
11	100%	100%	5	6
12	0%	0%	4	5
13	66.67%	80%	6	5
14	0%	50%	5	4
15	50%	66.67%	6	6
16	75%	50%	4	4
17	66.67%	66.67%	6	6
18	0%	0%	5	4
19	33.33%	50%	6	6
20	66.67%	100%	6	5
21	33.33%	100%	6	6
22	50%	50%	6	4
23	100%	0%	4	5
24	0%	66.67%	5	6
25	33.33%	66.67%	6	6

The results reveal substantial variability in repair rates among participants, ranging from 0% to 100% for both recast and elicitation feedback types. This variability likely reflects individual differences such as learning preferences, motivation, and the nature of errors targeted. Some participants achieved perfect correction rates with one or both feedback types, while others demonstrated much lower success rates.

Research Question 1: Comparing the Effectiveness of Recast and Elicitation

Research Question 1 investigated which feedback type, recast or elicitation, more effectively prompts error correction. To address this, a two-tailed independent samples *t*-test compared repair rates between the two feedback types. Results showed a statistically significant difference between recast ($M = 45.00$, $SD = 33.85$) and elicitation ($M = 67.87$, $SD = 36.25$), $t(46) = -2.75$, $p = .008$, indicating that elicitation led to a significantly higher average repair rate and is thus more effective in promoting error correction. To further understand learners' experiences and preferences, participants completed a brief questionnaire after the conversational sessions. One key question asked what activities participants most commonly engage in outside of class

to improve their Japanese skills, with options including (1) talking to friends via social media such as Facebook, (2) meeting with teaching assistants or tutors for conversation practice, (3) watching Japanese cartoons or movies, and (4) self-study. The distribution of responses is shown in Figure 4.

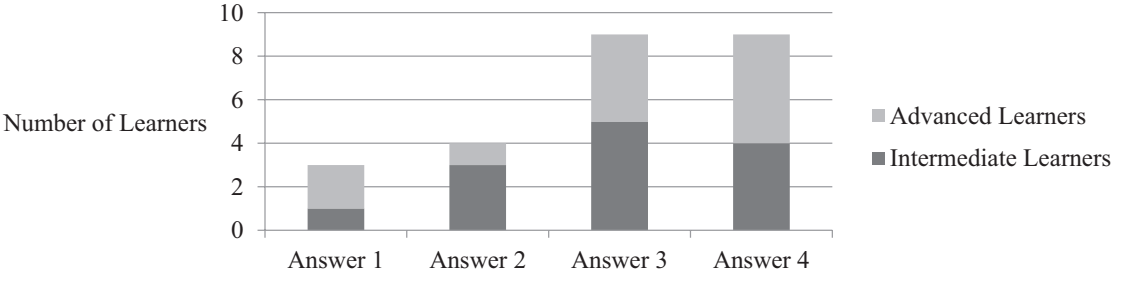

Figure 4. *Number of participants who chose each answer to question 1*

As shown, the majority of participants (72%) preferred independent learning activities that typically do not involve immediate corrective feedback, such as watching cartoons or movies and self-study. This tendency toward self-directed learning suggests that participants may have had limited exposure to immediate feedback during practice, which could make the errors highlighted through elicitation more noticeable and easier for learners to respond to. To further explore learner preferences, the second question asked: "What kind of feedback do you want your instructor to provide when you make an error?" Participants chose from options including (1) clear and very direct feedback about what needs to be corrected, (2) feedback that helps them find the correct answer, (3) feedback that provides the correct form without explicitly pointing out errors, (4) no feedback, or (5) other (with explanation). Figure 5 presents the distribution of their responses.

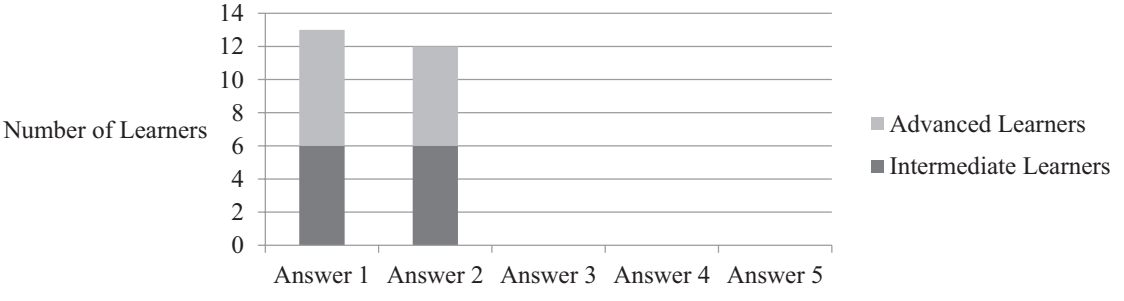

Figure 5. *Number of participants who chose each answer to question 2*

Notably, all participants selected either option 1 (explicit, direct feedback) or option 2 (elicitation), while no one chose option 3 (recast). This strong preference for explicit or output-prompting feedback supports the finding that learners favor feedback that requires active cognitive engagement, such as elicitation, over more implicit feedback like recast.

Research Question 2: Proficiency Level and Feedback Interaction

Research Question 2 examined whether advanced learners outperform intermediate learners, and how proficiency level interacts with feedback type. Table 3 summarizes the mean repair rates and standard deviations for each feedback type by proficiency level.

Table 3. *Repair rate statistics by feedback type and learner level*

	Advanced learners	Intermediate learners
Mean of repair rate for recast (*SD*)	45.83% (37.69)	44.23% (31.44)
Mean of repair rate for elicitation (*SD*)	79.17% (39.65)	57.44% (30.68)
Mean of average repair rate (*SD*)	62.50% (41.49)	50.84% (31.17)

Advanced learners showed a higher average repair rate (M = 62.50%, SD = 41.49%) compared to intermediate learners (M = 50.84%, SD = 31.17%). An analysis of variance (ANOVA) examined the effects of proficiency level and feedback type on repair rates, revealing no statistically significant interaction between proficiency and feedback type, $F(1, 46) = 1.037$, $p = .314$, but a significant main effect of feedback type, $F(1, 46) = 5.544$, $p = .023$, $\eta^2 = .11$, confirming that elicitation was more effective overall. Further independent samples t-tests showed a significant difference between advanced and intermediate learners in repair rates following elicitation feedback, $t(46) = 2.05$, $p = .046$, with advanced learners (M = 79.17%, SD = 39.65%) outperforming intermediate learners (M = 57.44%, SD = 30.68%). However, no significant difference was found for recast repair rates (Advanced: M = 45.83%; Intermediate: M = 44.23%). These findings suggest that the higher overall repair rate among advanced learners stems mainly from their greater success with elicitation feedback. The lack of a significant interaction may be due to the relatively small sample size, which reduces statistical power to detect such effects, as previous research (e.g., Serdar et al., 2021; Warner, 2012) recommends larger samples, typically over 30 participants per group, to better capture interactions. Additionally, high variability within groups, possibly reflecting differences in learning styles, motivation, or error types, likely contributed to overlapping performance and the non-significant interaction.

Ad Hoc Analysis of Linguistic Categories

Following the primary analyses, an ad hoc examination of linguistic categories was conducted to gain deeper insight into the types of errors learners made and how these may relate to the

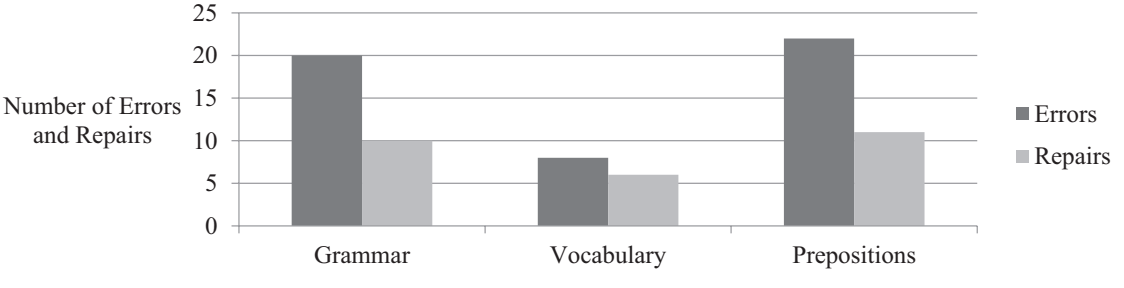

Figure 6. *Number of errors and repairs for advanced learners*

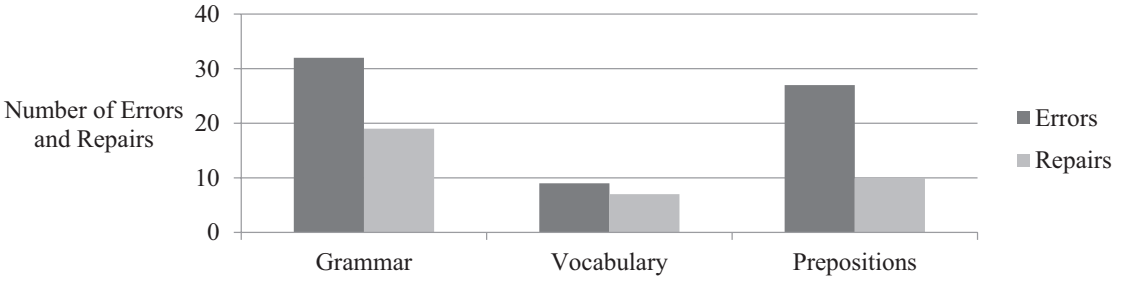

Figure 7. *Number of errors and repairs for intermediate learners*

patterns of feedback effectiveness observed. This additional analysis was motivated by the notably lower repair rates for grammar and prepositions, suggesting a need to explore the specific error types learners struggled with. To visualize these findings, Figures 6 and 7 illustrate the number of errors and repairs across three linguistic categories, grammar, vocabulary, and prepositions, separately for advanced and intermediate learners.

Both learner groups displayed a similar trend, with relatively few vocabulary errors but a higher incidence of errors in grammar and prepositions. This distribution may reflect underlying learning preferences and cognitive strategies. To explore this further, responses to Question 3 of the post-study questionnaire were analyzed, which asked participants about their preferred learning environment: "Which language class are you willing to take?" The options included (1) a class that is very interesting and entertaining, and (2) a class that is well-organized and planned. A majority of participants (68%, n = 17) preferred the "interesting and entertaining" class. This preference suggests that learners may prioritize communicative fluency and engagement, particularly in contexts involving spontaneous speech. Given the cognitive demands of planning, executing, and monitoring language production in real time, these learners may allocate fewer cognitive resources to consciously monitoring and applying complex grammatical rules and prepositional structures. This reduced cognitive allocation likely contributes to the higher frequency of grammar and preposition errors, as these linguistic features require more deliberate and effortful processing than vocabulary usage. These findings highlight the interplay between learner preferences, cognitive load, and error patterns, offering valuable insights for tailoring feedback toward areas that demand greater conscious attention.

Key Findings

The ad hoc analysis revealed a clear pattern: learners, regardless of proficiency level, struggled more with grammar and prepositions than with vocabulary. This suggests that the inherent complexity of grammar and prepositions demands more focused cognitive attention during language production. Questionnaire responses indicated that learners' preference for engaging communicative learning environments may reflect a prioritization of fluency over grammatical accuracy in spontaneous speech. These findings highlight the importance of pedagogical approaches that balance communicative activities with explicit attention to form. Instructors might incorporate activities that raise learners' awareness of common grammatical errors while providing targeted practice in both controlled and communicative contexts. Moreover, the effectiveness of OCF appears to be influenced by learners' preferences for communicative engagement as well as the specific linguistic challenges they face. For example, learners prioritizing communication may respond more positively to elicitation, which encourages active self-correction even when addressing complex grammatical structures.

Discussion

The observed differences in repair rates between advanced and intermediate learners, particularly regarding elicitation feedback, can be explained by several interacting factors. Although it was initially expected that advanced learners would outperform intermediate learners across all feedback types due to greater exposure and study of Japanese, the data revealed a more nuanced picture. Both groups responded similarly to recast feedback, with repair rates of approximately 46% for advanced learners and 44% for intermediate learners (see Table 3), suggesting that the recast provides comparable immediate benefits regardless of proficiency level. The key distinction lies in their response to elicitation feedback, which requires learners to independently generate correct or alternative forms, fostering deeper cognitive engagement. Advanced learners, possessing a richer linguistic knowledge base, are better positioned to utilize this feedback effectively. As Nassaji and Fotos (2011) note, elicitation tends to be especially effective for advanced learners because they have more refined error detection and correction skills and a larger repertoire of language knowledge to draw upon when prompted. This underscores the importance of tailoring feedback techniques to proficiency levels.

Recast provides the correct form, supporting both the acquisition of new declarative knowledge and the consolidation of existing language patterns. It encourages learners to reflect on their linguistic choices, thereby raising awareness of correct expression when they attend to feedback. In contrast, elicitation acts as a catalyst for proceduralization by prompting learners to actively retrieve and apply rules. This process strengthens connections between declarative and procedural memory, fostering greater automaticity in language use. Thus, the differential effects of recast and elicitation on error correction relate to their interaction with learners' cognitive processes and memory systems: elicitation engages declarative long-term memory through active retrieval, facilitating the encoding of procedural knowledge, while recast primarily supports working memory by supplying correct forms but may lack the same level of engagement necessary for proceduralization.

Several factors may have influenced the results and merit further consideration. Three participants (two advanced and one intermediate) did not respond to any feedback (see Table 2). Possible explanations include unfamiliarity with the one-on-one research environment (as opposed to a typical classroom setting), technical issues, and external distractions. It is plausible that the immediacy of face-to-face feedback could trigger social pressure and anxiety (Aslan, 2025), potentially hindering these participants' willingness or ability to respond during the interaction. Additionally, as Winne (2011) emphasizes, working memory capacity is limited; consequently, the cognitive load of processing and responding to feedback may have overwhelmed these participants, reducing their engagement. This cognitive challenge is particularly relevant in this study because the transient nature of auditory input requires substantial working memory resources to retain and process information before it fades (Mekheimer, 2024), a demand likely intensified in a formal research context.

Finally, while no statistically significant interaction between proficiency level and feedback type was found, possibly due to the limited sample size, future research with larger samples and measures of working memory capacity could provide more definitive insights. Such studies could better explore the complex interplay between proficiency, feedback type, and individual cognitive differences. It is important to note that smaller sample sizes reduce statistical power to detect effects, especially interactions.

Conclusion

This study underscores the critical importance of understanding cognitive processes in optimizing language instruction. Language proficiency is shaped by the dynamic interplay within the

complex architecture of human memory, particularly the pivotal transfer of information from working memory to long-term memory. This transfer stage involves the refinement and consolidation of linguistic information, preparing it for effective and fluent future use. Long-term memory, comprising both declarative (explicit) and procedural (implicit) knowledge, serves as the essential repository for the linguistic information necessary for communication. Different types of feedback influence these memory systems in distinct ways: recast primarily supports declarative knowledge, while elicitation fosters procedural learning.

Teachers play a vital role in guiding learners through this complex cognitive landscape. Strategic use of pedagogical tools such as OCF facilitates the transfer of knowledge between memory systems and enhances information processing. However, the effectiveness of feedback depends on its thoughtful application, tailored to learners' proficiency levels, individual learning styles, and preferences. For instance, explicit feedback like direct correction may benefit less proficient learners, while advanced learners might gain more from self-correction opportunities through elicitation or from implicit feedback such as recast, depending on their learning preferences. Aligning feedback strategies with the cognitive processes underlying learning, memory, and retrieval is essential to optimizing retention and promoting language proficiency. The differential responses observed in this study between recast and elicitation based on proficiency levels highlight the importance of integrating cognitive insights into feedback practices.

The intricate interaction between cognitive factors and pedagogical interventions reflects the richness of the language learning journey. By incorporating research from memory studies and adopting flexible, learner-centered approaches, educators can better support learners in navigating the complexities of language acquisition and fostering autonomy. While fluency and accuracy remain challenging goals, informed pedagogy, targeted support, and attention to individual learner needs offer a promising pathway to language mastery. Building on these findings, future research should explore the long-term effects of different OCF types on memory consolidation and retrieval. Longitudinal studies investigating retention of corrected forms and how these outcomes interact with proficiency levels and individual cognitive differences would provide valuable insights for refining feedback strategies in language learning.

References

Alloway, T. (2011). *Improving working memory: Supporting students' learning*. Sage Publications.

Anderson, J. R. (1983). *The architecture of cognition*. Harvard University Press.

Aslan, A. (2025). A comparative study into the emotional impact of peer feedback modalities in ELT. *Australian Journal of Applied Linguistics*, *8*(2), 102504. https://doi.org/10.29140/ajal.v8n2.102504

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation: Advances in research and theory* (pp. 89–195). Academic Press. https://doi.org/10.1016/S0079-7421(08)60422-3

Baddeley, A. (2002). *Human memory: Theory and practice*. Psychology Press.

Benati, A. G., & Angelovska, T. (2016). *Second language acquisition: A theoretical introduction to real-world applications*. Bloomsbury Academic.

Berger, K. S. (2006). *The developing person through childhood and adolescence*. Worth Publishers.

Brown, H. D. (2014). *Principles of language learning and teaching: A course in second language acquisition* (6th ed.). Pearson.

Carr, M., & Shotwell, M. (2007). Information processing theory and professional reasoning. In B. A. B. Schell & J. W. Schell (Eds.), *Clinical and professional reasoning in occupational therapy* (Chapter 3). Lippincott Williams & Wilkins.

Cox, E. (2002). *AS psychology for AQA specification B*. Oxford University Press.

Daneman, M., & Hannon, B. (2007). What do working memory span tasks like reading span really measure? In N. Osaka, R. H. Logie, & M. D'Esposito (Eds.), *The cognitive neuroscience of working memory* (pp. 21–42). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198570394.003.0002

Davey, G., Sterling, C., & Field, A. (2012). *Complete psychology*. Routledge.
Dehn, M. J. (2008). *Working memory and academic learning: Assessment and intervention*. John Wiley & Sons.
DeKeyser, R. M. (1998). Beyond focus on form: Cognitive perspectives on learning and practicing second language grammar. In C. Doughty & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 42–63). Cambridge University Press.
Doughty, C., & Williams, J. (1998). *Focus on form in classroom second language acquisition*. Cambridge University Press.
Ellis, R. (2009). Corrective feedback and teacher development. *L2 Journal*, *1*(1), 3–18. https://doi.org/10.5070/L2.V1I1.9054
Engle, R. W. (2001). What is working memory capacity? In H. L. Roediger, J. S. Nairne, I. Neath, & A. M. Suprenant (Eds.), *The nature of remembering: Essays in honor of Robert G. Crowder* (pp. 297–314). American Psychological Association. https://doi.org/10.1037/10394-016
Ernst, R. M., & Myers, D. G. (2003). *Thinking about psychology mini book: The science of mind and behavior*. Worth Publishers.
Fathimah, N. M. (2020). Teacher's corrective feedback to students' oral production in EFL classrooms. *Advances in Social Science, Education and Humanities Research*, *430*, 143–147.
Gass, S. (2003). Input and interaction. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 224–253). Wiley-Blackwell. https://doi.org/10.1002/9780470756492.ch9
Gass, S., & Mackey, L. (2000). *Stimulated recall methodology in second language research*. Routledge.
Goldstein, E. B. (2014). *Cognitive psychology: Connecting mind, research and everyday experience* (4th ed.). Cengage.
González-Burgos, I., & Feria-Velasco, A. (2008). Serotonin-dopamine interaction in memory formation. In G. D. Giovanni, V. D. Matteo, & E. Esposito (Eds.), *Serotonin-dopamine interaction: Experimental, clinical and therapeutic relevance* (pp. 603–623). Elsevier. https://doi.org/10.1016/S0079-6123(08)00928-X
Hall, G. (2016). *The Routledge handbook of English language teaching*. Routledge.
Halls, J. (2014). *Memory and cognition in learning*. Association for Talent Development.
Havranek, G. (2002). When is corrective feedback most likely to succeed? *International Journal of Educational Research, 37*(3–4), 255–270. https://doi.org/10.1016/S0883-0355(03)00004-1
Hayes, N. (2000). *Foundations of psychology*. Cengage.
Hulme, C., & Mackenzie, S. (2014). *Working memory and severe learning difficulties*. Psychology Press.
Hummel, K. M. (2021). *Introducing second language acquisition: Perspectives and practices*. Wiley-Blackwell.
Krashen, S. (1994). The input hypothesis and its rivals. In N. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 45–77). Academic Press.
Loewen, S. (2014). *Instructed second language acquisition*. Routledge.
Long, M. (2017). *Problems in second language acquisition*. Routledge.
Lord, J. (2022). *Psychology of education: Theory, research and evidence-based practice*. Sage Publications.
Lyster, R. (2004). Differential effects of prompts and recasts in form-focused instruction. *Studies in Second Language Acquisition, 26*(3), 399–432. https://doi.org/10.1017/S0272263104263021
Lyster, R., & Ranta, L. (1997). Corrective feedback and learner uptake: Negotiation of form in communicative classrooms. *Studies in Second Language Acquisition*, *19*(1), 37–66. https://doi.org/10.1017/S0272263197001034
Manto, M., Marvel, C., & Vandervert, L. (2022). *The new revolution in psychology and the neurosciences*. Springer. https://doi.org/10.1007/978-3-031-06093-9
Mekheimer, M. A. (2024). Working memory as a predictor of reading and listening comprehension in EFL college students: A reinvestigation. *Australian Journal of Applied Linguistics*, *7*(3), 2076. https://doi.org/10.29140/ajal.v7n3.2076
Nadif, B., & Bidari, S. (2023). Advanced tools in The EFL classroom: Friend or foe for novice teachers. *The Journal of Quality in Education*, *13*(21), 12–20. https://doi.org/10.37870/joqie.v13i21.336
Nassaji, H. (2016). Anniversary article interactional feedback in L2 classrooms: An updated meta-analysis and implications for practice. *Language Teaching Research*, *20*(4), 436–457. https://doi.org/10.1177/1362168816644940

Nassaji, H., & Fotos, S. S. (2011). *Teaching grammar in second language classrooms: Integrating form-focused instruction in communicative context*. Routledge.

Nassaji, H., & Kartchava, E. (2017). *Corrective feedback in second language teaching and learning: Research, theory, applications, implications*. Routledge.

Penning de Vries. B., Cucchiarini, C., Strik, H., & Hout, R. (2011). Adaptive corrective feedback in second language learning. In S. D. Wannemacker, G. Clarebout, & P. Causmaecker (Eds.), *Interdisciplinary approaches to adaptive learning* (pp. 1–14). Springer. https://doi.org/10.1007/978-3-642-20074-8_1

Pfenninger, S. E., Festman, J., & Singleton, D. (2023). *Second language acquisition and lifelong learning*. Taylor & Francis.

Porayska-Pomsta, K., & Pain, H. (2004). Providing cognitive and affective scaffolding through teaching strategies: Applying linguistic politeness to the educational context. In J. C. Lester, R. M. Vicari, & F. Paraguacu (Eds.), *Intelligent tutoring systems* (pp. 77–86). Springer.

Rkiki, A., Nadif, B., Sakale, S., & Bidari, S. (2025). Integrating corrective feedback in EFL classrooms: Harmonizing traditional pedagogies with digital innovations. *The Journal of Quality in Education*, *15*(25), 143–168. https://doi.org/10.37870/joqie.v15i25.472

Serdar, C. C., Cihan, M., Yücel, D., & Serdar, M. A. (2021). Sample size, power and effect size revisited: Simplified and practical approaches in pre-clinical, clinical and laboratory studies. *Biochemia Medica*, *31*(1), 27–53. https://doi.org/10.11613/bm.2021.010502

Shaffer, D. R., & Kipp, K. (2010). *Developmental psychology: Childhood and adolescence* (8th ed.). Wadsworth Cengage Learning.

Sheen, Y. (2004). Corrective feedback and learner uptake in communicative classrooms across instructional settings. *Language Teaching Research*, *8*(3), 263–300. https://doi.org/10.1191/1362168804lr146oa

Talsma, D. (2023). *The psychology of cognition*. Taylor & Francis. https://doi.org/10.4324/9781003319344

Ullman, M. T. (2016). The declarative/procedural model: A neurobiological model of language learning, knowledge, and use. In G. Hickok & S. L. Small (Eds.), *Neurobiology of language* (pp. 953–968). Academic Press.

Vickers, J. A. N. (2007). *Perception, cognition, and decision training: The quiet eye in action*. Human Kinetics.

Warner, R. M. (2012). *Applied statistics: From bivariate through multivariate techniques*. Sage Publications.

Wen, W., Mota, M. B., & McNeill, A. (2015). *Working memory in second language acquisition and processing*. Multilingual Matters.

Winne, P. H. (2011). A cognitive and metacognitive analysis of self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 15–32). Routledge.

Wong, L. (2015). *Essential study skills*. Cengage.