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Student perceptions of feedback and self-regulated language learning: A mixed-methods investigation

Yoshiyuki Nakata^a, W.L. Quint Oga-Baldwin^{b,*}, Atsuko Tsuda^c

^a Doshisha University, Japan

^b Waseda University, Japan

^c University of the Ryukyus, Japan

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ABSTRACT

This study investigated the impact of various types of oral feedback on self-regulated language learning. The participants were 114 s-year high school students. A mixed-methods approach was used for data collection, including: (1) a questionnaire reporting retrospective perceptions of feedback received in lower secondary school; (2) a questionnaire recording current feedback experiences in high school; and (3) a follow-up questionnaire ranking ideal feedback types and assessing the perceived frequency of feedback use. Longitudinal path modeling revealed that proficiency influenced students' recognition of different types of feedback in both junior high and high school. Students indicated a preference for praise while expressing a dislike for self-correction. Notably, a greater discrepancy between students' preferred and actual feedback redevents desire for correction and their perceived reality. Open-ended responses acknowledged the role of self-correction in learning, but emphasized a preference for praise. These findings highlight a misalignment between students' preferences and instructional practices. While this discrepancy may influence learning outcomes, it also appears to predict them.

1. Introduction

Feedback is a critical instructional tool for many language teachers, facilitating effective language learning and accelerating language acquisition. Many studies emphasize the importance of feedback in education generally and foreign language education specifically (Havranek, 2002; Lyster et al., 2013; McKay, 2006; Nassaji & Kartchava, 2017). Hattie and Timperley's (2007) 12 meta-analyses, encompassing 196 studies and 6972 effect sizes, found that the influence of feedback on learning was twice as powerful as other schooling effects. However, they also identified significant variability in efficacy among types of feedback (see Li, 2010 for the effectiveness of corrective feedback in SLA). Certain types of feedback—such as cues and reinforcement—are more effective than others, such as praise, rewards, and punishment, but does this finding apply universally across students with varying language proficiency levels? Which types of feedback are most effective in accelerating L2 learning and fostering a self-regulating, positive cycle of language learning? Consideration of these questions is essential for effective language teaching.

Self-regulated learning (SRL) refers to "the processes whereby learners personally activate and sustain cognitions, affects

E-mail address: quint@waseda.jp (W.L.Q. Oga-Baldwin).

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^{*} Corresponding author. Faculty of Education and Integrated Arts and Sciences, Waseda University, 1-6-1 Nishi Waseda, Shinjuku, Tokyo, 169-8050, Japan.

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[motivation], and behaviors that are systematically oriented feedback loops through which they can monitor their effectiveness and adapt their functioning" (Zimmerman & Schunk, 2011, p. 1). Self-regulated learners leverage external factors or information, such as teacher feedback, to enhance their learning. The most effective type of feedback for each language learner varies depending on their individual circumstances, language development stage, and readiness to receive feedback (Sheen, 2011).

For feedback to effectively support SRL, it must be contextually appropriate and delivered when needed. Ideally, feedback should bridge the gap between "what we know and can do, and what we aim to know and do" (Hattie, 2012, p. 115), benefiting both students—regardless of their achievement level—and teachers, whether experienced or struggling. To maximize the impact of feedback, teachers must understand "where the students are" and "how they can help students to the success points, and thus enjoy the fruits of feedback" (Hattie, 2012, p. 115). Therefore, this paper explores the effects of various feedback inputs on SLR, offering insights into how feedback can support learners at different stages of their educational trajectory.

2. Background literature

2.1. Feedback in foreign language teaching

Feedback is a well-established tool in language education and applied linguistics (Hyland, 2006; Nassaji & Kartchava, 2017). It plays a key role in helping learners notice L2 forms, thus supporting their language acquisition (McKay, 2006). While extensive research has examined written feedback, the form and function of oral feedback in promoting learners' self-regulated learning remains underexplored (Ellis, 2017; McKay, 2006).

Oral feedback can be categorized in several ways. One distinction lies between subjective feedback—based on an instructor's general judgment of a learner's overall performance—and objective feedback, which includes specific, detailed comments about their specific performance (Ryan & Deci, 2017; Seufert, 2018). High-achieving, self-regulated learners are more likely to benefit from objective, detailed feedback for the improvement of their learning. In contrast, low achievers, characterized as "naive self-regulators," may struggle to apply this type of feedback effectively (Zimmerman, 1998, p. 6).

Another distinction is whether the feedback is positive or negative (Hyland & Hyland, 2019). Hattie and Timperley (2007, p. 99) argue that "disconfirmatory feedback" can have a negative impact on students, particularly those with lower ability, while positive feedback, even if impressionistic or praise-based (e.g., "wonderful," "excellent," or "great"), can effectively sustain language learning. Negative feedback may reduce the confidence of struggling learners, prompting them to adopt self-handicapping strategies that may hinder their future learning if they react negatively to the outcome and thus become more defensive (Kerr, 2020; Zimmerman, 1998). These types of feedback have significant implications for learners' affect, which is one of the motivational elements of learning a language. Indeed, affective-motivational elements are particularly salient during the forethought phase of the self-regulation cycle (Zimmerman, 2000), in which learners develop self-efficacy and outcome expectations.

From both affective and cognitive perspectives, excessive praise can discourage high achievers or highly self-regulated learners who seek feedback from teachers in order to guide their improvement. Hattie and Clarke (2019, p. 43) define praise as "commendations about students' worth, an expression of approval or admiration," which differs from positive reinforcement aimed at encouraging learners to address specific challenges independently (also see Kerr, 2020 for a similar discussion). Frequent praise can leave learners, and high achievers or self-regulated learners in particular, with the impression that teachers have a low expectation of the student's performance. This can lead to a sense of "helplessness in the face of challenging tasks" (Hattie & Clarke, 2019, p. 43). Thus, they warn that "praise will interfere with and dilute the message about learning" (p. 45) if students do not learn from it. In other words, praise may disrupt the self-reflection phase of the self-regulation cycle, where learners need to evaluate what they can and cannot do and apply this information toward improvement (Zimmerman, 2000). Specifically, feedback should include motivational scaffolding ("small success and personally relevant") and cognitive scaffolding ("helping develop better language learning strategies") (Nakata, 2020, p. 114; also see Brophy, 2010; van Eekelen et al., 2005).

Another feedback distinction is between evaluative or descriptive elements. According to the Teacher Standards and Accreditation of NSW (New South Wales) Department of NSW Department of Education (2022), evaluative feedback often provides learners with brief, positive, but general comments (e.g., "Well done"), while descriptive feedback provides more concrete evidence (or food for thought) toward their further improvement (e.g., "This is a good Introduction because you ... Now which points do you think you should ..."). Evaluative praise has long been recognized as a somewhat weak form of feedback (Harris & Rosenthal, 1985). Moreover, praise as feedback may be viewed as controlling rather than supportive (Kohn, 1993), with all of the adverse effects associated therein (Deci et al., 1999). At the same time, however, praise remains a commonly used form of feedback in many classrooms (Brooks et al., 2019); indeed, praise and criticism remain strongly linked in the minds of many teachers when discussing feedback (Hattie, 2023). Therefore, it is useful to account for this form of feedback in classrooms, even while noting its weakness, as a way to promote learning and self-regulation.

Additionally, feedback can be distinguished as being either implicit or explicit (Ellis et al., 2006; Kerr, 2020). Implicit feedback often takes "the forms of recasts (corrective reformations of a learner's non-target-like utterance) and clarification requests (e.g., 'pardon')," while explicit feedback involves "explicit correction (e.g., 'no, it is not eated—ate')" (Adams et al., 2011, p. 42). Both forms of feedback can be offered to students for different purposes, via either the motivational aspects of scaffolding (i.e., supporting students' emotional enhancement, such as self-efficacy) or the cognitive aspects of scaffolding (i.e., helping students to understand their weaknesses and strengths to improve their performance) (Brophy, 2010). In an ideal EFL environment that supports autonomy and SRL, motivationally supportive feedback is often subjective or objective, positive, and explicit, while cognitive scaffolding is more likely to be objective, either positive or negative, and explicit. This aligns with Zimmerman's (2000) cyclical model of self-regulation,



Fig. 1. Simplified model of the knowledge-feedback-action loop.

in which specific conditions accelerate SRL for each learner at every stage.

Given the social, contextual, and sequential nature of feedback and the self-regulation process, another possible distinction is the timing of feedback (e.g., either immediate and public in the classroom, or delayed and individual after class). While there is some disagreement about the appropriate timing in feedback within the field of second language acquisition (Ellis & Shintani, 2013; Nassaji, 2016; Quinn & Nakata, 2017), empirical evidence from educational psychology supports delaying individual feedback (Butler & Woodward, 2018) as this may be more likely to promote the noticing of errors and support self-management (Hattie & Clarke, 2019, pp. 88–89). The choice between immediate and delayed feedback depends on the teacher's close monitoring of the learning situation. The type, timing, context, and learner readiness may ultimately have a greater impact on accelerating language learner' SRL.

In classrooms where the medium of instruction is English, feedback requires teachers to provide prompts (e.g., elicitation, metalinguistic clues, clarification requests, and repetition) (Lyster & Mori, 2006). In their comparative study of teacher-student interactions in primary French immersion and Japanese immersion classrooms, Lyster and Mori (2006) found that recasts were less effective than prompts for L2 development and varying student-preferred feedback types. Prompts act as cues, allowing the learner "to draw on their own resources for self-repair" (a form of SRL), whereas explicit correction and recasting "start and complete the repair in a single movement" (Lyster & Mori, 2006, p. 273). For a learner aiming to become an active agent of foreign language learning, prompts offer more opportunities for self-regulation than explicit corrections and recasts, which complete the feedback process without emphasizing learners' self-regulatory processing. In this respect, Ryan (2018) encourages teachers to avoid coercive language ("should, must, ought to") and instead use non-controlling language or rewards (i.e., implicit prompts for correction, such as: "I have noticed your … Do you have any ideas about this?"). This autonomy-supportive classroom atmosphere allows learners to engage with feedback using their own agency (Reeve, 1996; Ryan, 2019). Agentic prompting therefore promotes greater self-regulated language learning when students are ready for feedback and capable of self-reflection (Zimmerman, 2000).

Extensive discussion and empirical investigations have emphasized the importance of noticing and awareness-raising. Nassaji (2016) reviewed several decades of international feedback studies, showing how using a combination of context-sensitive feedback strategies in learner-centered ways can maximize learning outcomes. These studies covered the instructional aspects of feedback, such as timing, format, and context, while a few explored the motivational and self-regulatory functions of feedback, such as controlling language and praise. However, very few studies have examined how students understand and value feedback input in order to take action (Hattie, 2023). Addressing this gap would reveal how learners interpret types of verbal teacher feedback and translate them into engaged, self-regulated language learning.

2.2. Feedback and self-regulated learning

The feedback that is inherently involved in students' cognitive process is pivotal in promoting SRL (Butler & Winne, 1995; Hyland, 1990; Lee, 2014). Feedback has been identified as the mechanism through which teachers bridge the gap between students' current level of understanding and the desired outcome level they aim to attain (Ellis, 2017; Hattie, 2023; Hattie & Timperley, 2007; Lyster et al., 2013; Sheen, 2011). Feedback plays an important role in Zimmerman's (2000) three phases of self-regulation: forethought, performance, and self-reflection. According to this model, learners' self-perceptions of ability help them transition from forethought to performance, while feedback directs attention to key task features during the shift from performance to self-reflection.

The effects of feedback on the affective (motivational), cognitive, and behavioral aspects of L2 learning are instrumental to the feedback-SRL model. The perceived motivational impact of feedback facilitates the transition from thought to behavior and outcome (Zimmerman, 2000). According to Hattie and Timperley's (2007) model, feedback prompts learners (as well as teachers) to assess three questions: *Where am I going?*; *How am I going?*; and *Where to next?* This process helps learners become more self-regulated in their learning. These questions align with the metacognitive, motivational, and goal-oriented aspects of learning. Reflections based on these

questions contribute into judgments about task understanding, recognition of processes and actions, and self-monitoring and direction. By incorporating past and current performance and motivation into SRL, learners combine teacher instruction with prior knowledge and motivation to achieve higher learning outcomes (see also Kerr, 2020, pp. 3–4 for the characteristics of effective feedback in L2). A simplified version of this model, based on the framework presented by Hattie and Timperley (2007), is shown in Fig. 1.

To understand the role of feedback in SRL, it is essential to address how teachers provide feedback, how students perceive it, and how they subsequently translate feedback into action (Nicol & Macfarlane-Dick, 2006; Rassaei, 2013). This process of perception and translation is crucial because it is not just the feedback itself that influences learning, but also how it is internalized and acted upon.

Many learning models consider prior achievement to be the starting point for building student success (e.g., Alexander, 2003), and models for feedback uptake in SRL acknowledge the importance of recognizing students' prior performance (Hattie, 2023; Winne & Nesbit, 2010). Learning outcomes, such as achievement, can be seen as evidence that learners have effectively internalized instructional feedback and applied it appropriately. However, questions remain about the most appropriate and desirable forms of feedback.

Importantly, there are variations in how feedback helps bring students from their current level of knowledge to the next step. The most effective forms, as highlighted in large-scale, meta-analytic studies, are those that prompt students to take specific actions, address errors immediately, and provide tasks to help remedy those errors (Hattie, 2023). However, the effectiveness of these actions is influenced by the student's perception of the feedback (Ryan, 2023).

A key aspect of feedback is how students respond—either positively or negatively—to the teacher's external feedback. These interpretations help explain why students may internalize teacher feedback or perceive it as having a significant positive impact on their subsequent learning (Ivanic et al., 2000; Nicol & Macfarlane-Dick, 2006). In this regard, self-determination theory (SDT; Ryan, 2023; Ryan & Deci, 2017) offers valuable insights. According to SDT, for feedback to be truly internalized and lead to SRL, it must support students' basic psychological needs for autonomy, competence, and relatedness.

Feedback that is controlling or coercive can undermine students' sense of autonomy, leading to resistance or disengagement. In contrast, feedback that offers choices, acknowledges the student's perspective, and encourages self-reflection is more likely to be internalized. This aligns with findings on the effectiveness of learner-centered feedback (Nassaji, 2016). In this framework, effective feedback aims to enhance students' sense of competence by highlighting their strengths, acknowledging their progress, and providing opportunities for them to demonstrate their abilities. Feedback that focuses solely on errors or shortcomings can be demotivating and hinder self-regulated learning. Conversely, feedback that conveys care, respect, and a genuine interest in the students' learning fosters a sense of relatedness and strengthens the student-teacher relationship, increasing receptivity to feedback and motivation to learn.

Connected to learner-centered, need-supportive feedback (Nassaji, 2016; Ryan, 2023) is the idea that students may ultimately dismiss praise and feedback that they perceive as repetitive or disingenuous (Hattie, 2012; Hyland & Hyland, 2019). At time, students may fail to incorporate feedback when it is mixed with praise (Hattie, 2023). This aligns with SDT's emphasis on authentic feedback that supports intrinsic motivation—empty praise or conditional feedback can undermine a student's sense of autonomy and competence.

Despite the recognition that different types of feedback offer varying levels of support and prompt different forms of uptake and self-regulation (Brooks et al., 2019), research on the types, effects, and impact of different types and styles of feedback in regular classroom settings remains limited (Hattie, 2023). Both synthetic reviews of feedback (Nassaji, 2016) and meta-analytic perspectives on motivation (Bureau et al., 2022) highlight the importance of learner-centered approaches to instruction for promoting sustainable, self-regulatory motives. Therefore, there is a need to better understand the elements and types of feedback that promote self-regulatory action, evidenced by learning uptake. To build an integrated model of feedback, it is essential to explore its role in promoting self-regulated language learning.

2.3. The current study

This study investigates the impact of different types of oral feedback on self-regulated language learning. These different types of feedback include: (1) evaluative feedback (i.e., positive subjective feedback only with emotional scaffolding: "good, wonderful, excellent"); (2) explicit corrective feedback (i.e., clear, concrete, and specific feedback on errors: "No, it is not ... but ..."); (3) descriptive feedback (i.e., positive informational feedback with concrete evidence: "This point was good/excellent/wonderful because you have done ..."), (4) individual corrective feedback (i.e., clear, concrete, and specific individual feedback on errors: "No, it is not ... but ..."); and (5) implicit prompts for correction (i.e., non-controlling language: "I have noticed your ... Do you have any ideas?"). These types of feedback were selected in line with theoretical and practical discussions regarding L2 learning (Adams et al., 2011; Lyster et al., 2013; Nassaji, 2016), education (Hattie & Timperley, 2007; Kerr, 2020; NSW Department of Education, 2022), self-regulated learning (Zimmerman, 2000), and motivation (Ryan, 2018; Ryan & Deci, 2017). In this way, we aim to bridge these fields and provide vital information about oral feedback that promotes students' self-regulation.

Due to the complex and contextual nature of oral feedback in L2 classroom, this research inquiry was investigated using a mixedmethods approach (Creswell, 2013; Creswell & Poth, 2018). Given the exploratory nature of this study, no hypotheses were registered prior to conducting the analyses. The following research questions were designed to identify the impact of students' attitudes toward feedback on their learning while providing a detailed picture of how feedback is perceived.

Research Questions.

RQ1: What is the relationship between students' proficiency, feedback motivation (the perceived motivational effect of feedback), and feedback preference?

RQ2: Which types of feedback help to promote learners' self-regulated language learning?

3. Methods

3.1. Sample and research context

As part of the third author's practitioner research, preliminary instrument piloting was conducted in July 2020 with her two intact classes of 48 s-year high school students (Class 1 n = 20, Class 2 n = 28) to determine the suitability of the questionnaire surveys, which included both closed and open-ended questions. The initial questionnaire included four items in five different situations (Appendix A's multiple-choice and open-ended sections). Survey items (Appendix A) were confirmed based on initial answer patterns, and additional questions (Appendix B) were further developed.

Subsequently, a longitudinal investigation was conducted over one year with 114 s-year high school students (male: 69, female: 45) in three classes (Class 1 = 37; Class 2 = 43; Class 3 = 34) of a single public high school in the Kansai region of Japan. Participants were informed of the aims and scope of the research, and survey completion was voluntary. These participants represented a convenience sample gathered by the third author. Data were collected between February 2020 and February 2021 at four time points (February 2020, October 2020, January 2021, and February 2021). As is standard in Japanese secondary schools, students were sorted into cohort classes, with all students in a cohort taking the same courses and subject to the same schedule. The three cohorts in this study were enrolled in liberal arts, science, and advanced science courses. Class course registration was determined by entrance examination and self-selection after enrollment. No significant differences in English proficiency were found between any of the classes, *F* (2, 112) = .91, *p* = .4.

Participants from this public high school were mainly learning English in preparation for the University Entrance Examination, which focuses on testing English reading, grammar and some listening skills. According to their standardized test scores (described below), the students tended to fall into the CEFR A2 range, reflecting the approximate average score for most high school students across Japan (Ministry of Education, Culture, Sports, Science, & Technology [MEXT], 2023). The teacher (the third author) was an experienced CLIL teacher, and employed her experience in the classes in question.

3.2. Ethical procedures

The students were informed of the general scope of the research and participated in the survey voluntarily. Additionally, they were allowed to withdraw their participation; however, none of the participating students indicated a desire to withdraw. All data collection met the ethical standards of all participating institutions, and the school administrators allowed the research to proceed. The third author, a secondary school teacher at the time, voluntarily participated in the project, teaching the participants and collecting the data as part of her "research involvement" (Borg, 2010). Finally, no specific pedagogical intervention was made during this project.

3.3. Instruments

Given the complex nature of SRL, a mixed-methods approach offers the best chance of triangulating the construct (Creswell, 2013). While survey instruments for measuring SRL are available (Roth et al., 2016), these instruments do not capture the dynamic nature of the constructs. Moreover, many of the most widely-used instruments do not take feedback into consideration, and contain large numbers of items (Roth et al., 2016). Given the large sample sizes needed and the general problems with long, self-reported surveys (Fryer & Dinsmore, 2020), we elected to develop our own short measures to determine the motivational elements of students' self-regulated learning.

3.3.1. English language proficiency

A standardized English test was used to measure the students' English proficiency. The General Test of English Comprehension (GTEC; Benesse Corporation, n.d.) is a four-skills test of English capacity. While GTEC is a widely used standardized test, individual test internal reliability statistics have not been publicly released, though test correlations with other tests have demonstrated an acceptably strong relationship with other standardized measures, such as the TOEFL and the TOEIC (Kim & Chin, 2019). According to the test's designers, scores ranging between 680 and 930 correspond to A2 level on the CEFR (see GTEC; Benesse Corporation, n.d.). This

Table 1

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scores	renecting	degrees	of intrinsic	mouvation.

Feedback Type	Item Prompt: How do you feel when:	Time	Mean	SD	Reliability (α)
Evaluative	the teacher praises your answer?	JHS	3.69	.90	.87
		HS	3.62	.88	.89
Explicit corrective	the teacher corrects your error?	JHS	3.49	.74	.70
		HS	3.49	.83	.80
Descriptive	the teacher praises a specific aspect of your response (vocabulary, grammar, etc.)?	JHS	3.88	.91	.89
		HS	3.83	.95	.90
Individual corrective	the teacher tells the correct answer?*	JHS	3.28	.71	.76
	the teacher corrects you individually at later time?	HS	3.65	.94	.89
Implicit prompts	the teacher indicates an error but pushes you to correct it?	JHS	3.82	.81	.85
		HS	3.80	.88	.89

Note: Correction after class was deemed to be limited in junior high schools.

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proficiency range is representative of most high school students (MEXT, 2023).

In addition to English language proficiency as measured by the standardized test noted above, the questionnaire includes an item asking about the students' perceived language proficiency compared to their classmates (See Appendix A: *How do you think your English ability compares to your classmates*? "My English ability is [1. above average, 2. about average, 3. below average] compared to my classmates.") In turn, these self-assessments (above average, average, below average) correlated strongly with test performance, with r = .63.

In the subsequent qualitative analysis process, students' self-perceptions of high, average, and low proficiency were used as grouping variables. Given the impact of students' self-perceptions on SRL development (Zimmerman, 2000), students' self-assessment of perceived their language proficiency level was considered more appropriate for distinguishing students than assigning students to groupings based on the arbitrary cutoff of GTEC scores.

3.3.2. Survey instruments

The students were asked about their perceptions of different types of feedback in lower secondary school, as well as their perspectives on these feedback types in their current high school learning. Survey items included ratings of motivational praise, explicit corrective feedback, descriptive feedback, individual corrective feedback, and non-controlling feedback, including implicit prompts for correction (Adams et al., 2011; NSW Department of Education, 2022; Hattie & Timperley, 2007; Kerr, 2020; NSW Department of; Ryan, 2018). Based on the elements of motivational and cognitive scaffolding (Nakata, 2020; Brophy, 2010; van Eekelen et al., 2005), a common four-item, five-point Likert-style response scale was used to assess the motivational impact of each feedback type according to each scenario, with one item measuring feelings of enjoyment, value, and capability experienced by each student during the target situation (see Appendix A). Table 1 presents descriptive statistics and reliabilities for the initial survey. These items were used to record the motivational impact of feedback, with reflections on students' feedback experiences from junior high school, as well as their current high school experiences. Students then recorded open-ended comments regarding their experiences with each type of feedback, with these reflections being recorded in October 2020.

In the follow-up survey circulated in January 2021, students were asked about the perceived gap between their ideal and actual feedback experiences based on the items from the first survey (see Appendix B). The students were instructed to rate their perceived ideal teacher feedback and teachers' frequency of use for these types of feedback. Students recorded the ideal type(s) of feedback that they wanted to receive from their English teacher, as well as the actual feedback experiences they were currently receiving. Students ranked each type of feedback in terms of desirability, and then indicated the frequency of the type of feedback they were receiving. The discrepancy between these measures was then used to establish differences between the ideal and the actual, using a square transformation for each indicator. A root mean square transformation for the sum of the total discrepancies was conducted to ensure a positive value for the analyses. This survey also included a free-response section allowing students to report on reflections regarding feedback discrepancies. Table 2 presents the ideal and actual discrepancies and permits comparison of mean scores.

3.4. Analyses

To address Question 1, a fully forward path model was constructed using the complete data sample. Fig. 2 presents the hypothesized model. The students' English capacity in February 2020 was used to predict all future variables. Reflections on their junior high school experiences with feedback were recorded alongside the students' current motivational perceptions of feedback received in October 2020, and then used to predict discrepancies in feedback preferences. All prior variables were then used to predict English proficiency on the GTEC test in February 2021. While intraclass correlations generally remained low (see Table 3) students were nested within classes, indicating a potentially multilevel scenario. At the same time, the number of clusters was low (three classes), and therefore likely to cause bias and potential computational issues (Maas & Hox, 2005; Steenbergen & Jones, 2002). As a result, cluster robust standard errors based on class membership were employed to account for the groupings. To compensate for the relatively small size of the sample, Maximum Likelihood estimation with bias-corrected bootstrapping of 1000 samples was used to generate more reliable data. Quantitative analyses were performed independently by the second author using JASP (JASP Team, 2022) and MPlus 8.2 (Muthén & Muthén, 2020).

Theoretical justification for the model is grounded in robust frameworks of learning and self-regulation. Prior achievement is widely recognized as a powerful predictor of individual differences (Alexander, 2003), influencing motivation and ability beliefs (Fryer & Oga-Baldwin, 2019), which are key elements of self-regulatory function (Ryan, 2023; Ryan & Deci, 2017; Zimmerman & Schunk, 2011). Students' perceptions of their environment, including the perceived effects of feedback, are shaped by their prior experiences of achievement and their personal beliefs (Ryan & Deci, 2017; Wiener, 1986). According to Hattie (2023), feedback,

Table 2

Discrepancies	between	ideal	feedback	and	actual	feedbacl	k received.
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Feedback type	Ideal <i>m</i> [95% CI]	Actual m[95% CI]	<i>t</i> (109)	р	d
Evaluative	3.35 [3.07, 3.64]	1.95 [1.72, 2.17]	9.67	<.001	1.03
Explicit corrective	3.26 [3.04, 3.49]	3.15 [2.95, 3.36]	.98	.33	ns
Descriptive	2.36 [2.13, 2.60]	2.35 [2.13, 2.56]	.14	.89	ns
Individual corrective	3.55 [3.30, 3.81]	4.25 [4.05, 4.46]	5.06	<.001	.57
Implicit prompts	2.46 [2.20, 2.73]	3.30 [3.05, 3.55]	5.67	<.001	.65



Fig. 2. Hypothesized longitudinal model tested.

Table 3

Pairwise correlations and descriptive statistics (descriptive statistics are presented on the diagonal in bold text).

	Intraclass Correlation	English Test T1	English Test T2	Feedback Discrepancy	JHS Feedback Motivation	HS Feedback Motivation
English Test T1	.002	(m 800.50, SD 104.12)				
English Test T2	.006	.85***	(m 841.60, SD 98.71)			
Feedback Discrepancy	.115	04	.07*	(m 4.98, SD 2.22)		
JHS Feedback Motivation	.000	.27*	.25**	08	(m 3.53, SD .68)	
HS Feedback Motivation	.054	.26**	.29**	.01	.70***	(m 3.62, SD .82)



Fig. 3. Longitudinal model results

*Note: Per reviewer requests, we tested the model without the Discrepancy variable. Removing the variable did not significantly alter the model results and led to a less meaningful model, in which prior performance was the only statistically significant predictor of post-test performance.

motivation, and prior achievement are all crucial predictors of measurable learning outcomes. The model depicted in Fig. 2 was designed to account for these potential interrelationships. It builds on process-oriented models proposed by Dörnyei (2000) and Biggs and Telfer (1987), where prior ability serves as the presage variable, motivation and perceptions of feedback function as process variables, and final achievement represents the product variable.

The students provided self-assessments of their English ability (perceived language ability) as either above average, average, or

below average. These self-assessments were used as grouping variables during the qualitative analyses to examine the impact of feedback on SRL development as potentially mediated by ability levels. These self-assessments were validated against the students' Time 1 English test scores using analysis of variance (ANOVA). The results reveal a clear stepwise increase corresponding to the students' self-assessments, F(2, 109) = 37.22, p < .001, $R^2 = .41$, supporting the validity of these groupings. Repeated-measures ANOVA tests were conducted to assess differences in feedback preferences and actual feedback received based on students' self-assessed levels. Self-assessed groupings were deemed more representative of students' levels than arbitrary groupings based on arbitrary group cutoffs from test scores.

Qualitative analyses of students' free responses were performed through independent coding by the first and third authors, concurrent with the quantitative analyses. Upon completing the initial coding, the codes were reviewed and discussed with the second author during a peer debrief, who confirmed or refined the definitions and assignments. Disagreements were resolved through discussion until consensus was reached. A similar process was conducted as a member check with the third author. All codes were translated from Japanese to English through a similar consensus-based process. The details of this qualitative analytical procedure are as follows.

- (1) The students' free responses about feedback received at junior high school and high school were classified according to students' perceived language ability (above average, average, below average).
- (2) Using Nvivo for Mac (Version 1.5), the first author determined thematic nodes overarching the comments for each of the three levels. The number of references for each node was recorded through negotiation between the first author and the third author, according to the following themes: recast, no feedback, long wait, length of waiting time, lack of instruction, joy and general praise, elicitation, concrete praise, inappropriate timing of praise, error correction, and individual consultation.
- (3) Through the same negotiation, mid-level thematic nodes were created based on each type of feedback mentioned in the questionnaire: evaluative, explicit corrective, descriptive, individual corrective, implicit prompts;
- (4) Nodes were further organized into higher level nodes based on the SDT framework (e.g. evaluative: joy, confidence → *intrinsic motivation*) by the second author.
- (5) Finally, coded statements were extracted as illustrative of students' perceptions of feedback as either supportive of inner motivational resources or controlling and thwarting of those motivational resources, according to SDT (Ryan & Deci, 2017). These codes were referenced against accepted SDT educational practices (Ahmadi et al., 2023; Reeve et al., 2022).

Codes to illustrate self-regulatory functioning were illustrated using statements keyed to the development of cognitive and metacognitive skills (Zimmerman & Schunk, 2011).

4. Results

4.1. Quantitative surveys

4.1.1. The relationship between proficiency, perceived motivational effect of feedback, and feedback preference The measurement model for the motivational effects of feedback in junior high school (JHS) and high school (HS) demonstrated

Table 4

Mean values, confidence intervals, and ANOVA results for each variable.

		High (<i>n</i> = 21)	Mid (<i>n</i> = 49)	Low (<i>n</i> = 44)		F	р	η^2	Post Hoc Test Differences
Evaluative	Ideal	3.94 [3.23,	3.04 [2.58,	3.43 [2.94,	Ideal-Actual	108.06	<.001	.23	H: I > A, M: I > A, L: I
		4.65]	3.42]	3.92]					> A
	Actual	1.50 [1.14,	2.09 [1.72,	2.00 [1.58,	Between by	6.72	.002	.03	I: $H > L > M$, A: $M > L$
		1.85]	2.46]	2.42]	Level				> H
Explicit corrective	Ideal	3.10 [2.57,	3.44 [3.10,	3.31 [2.98,	Ideal-Actual	1.00	.318	.00	ns
		3.65]	3.85]	3.64]					
	Actual	3.06 [2.57,	3.33 [3.02,	3.10 [2.75,	Between by	.14	.869	.00	ns
		3.61]	3.64]	3.44]	Level				
Descriptive	Ideal	2.40 [1.77,	2.22 [1.84,	2.50 [2.13,	Ideal-Actual	.10	.751	.00	ns
		3.00]	2.59]	2.87]					
	Actual	2.78 [2.15,	2.07 [1.74,	2.41 [2.05,	Between by	1.09	.342	.00	ns
		3.41]	2.40]	2.76]	Level				
Individual	Ideal	3.28 [2.62,	3.71 [3.32,	3.41 [2.94,	Ideal-Actual	23.30	<.001	.07	H: ns, M: ns, L: $A > I$
corrective		3.93]	4.07]	3.87]					
	Actual	4.22 [3.64,	4.27 [3.94,	4.19 [3.84,	Between by	.521	.595	.00	ns
		4.80]	4.59]	4.54]	Level				
Implicit prompts	Ideal	2.28	2.58 [2.19,	2.36 [1.93,	Ideal-Actual	30.627	<.001	.09	H: A > I, M: ns , L: A > I
		[1.56,2.99]	3.02]	2.79]					
	Actual	3.44	3.24 [2.84,	3.31 [2.91,	Between by	.747	.476	.00	ns
		[2.80,4.08]	3.65]	3.71]	Level				

Note: H = High, M = Mid (average), L = Low (perceived level of language proficiency); I = Ideal, A = Actual.

acceptable fit (χ^2 (26) = 40.721, CFI = .99, RMSEA = .075, JHS coefficient range .57–.88; HS coefficient range .74–.98). The longitudinal predictive model indicated acceptable fit (χ^2 (10) = 234.906, CFI = 1.00, RMSEA = .000 [saturated model]). Students' prior English test performance was a strong predictor of their final test scores, β = .86, p < .001. Prior English test scores also predicted reflections on junior high school and high school motivation, with JHS β = .24, p < .001, HS β = .32, p < .001, but did not predict perceptions of a discrepancy between ideal and actual feedback. The motivations for receiving feedback in junior high school and high school were strongly and significantly correlated, r = .68, p < .001. Motivations for receiving feedback did not significantly predict students' responses regarding the discrepancy between the ideal and actual feedback received.

Greater discrepancy between the ideal and actual feedback received significantly predicted English test performance at the end of the school year, $\beta = .12$, p < .001. Additionally, students' recollection of the motivational impact of their feedback experiences in junior high school predicted their test outcomes, $\beta = .17$, p < .001. No other significant relationships were identified*. Fig. 3 displays the complete model results with fit indices, while Table 3 presents the corresponding correlations and descriptive statistics used to derive the structural equation model.

4.1.2. Important differences between students' preferences for specific feedback types based on perceived language proficiency levels

Within-subjects ANOVA tests revealed statistically significant differences for evaluative feedback, individual corrective feedback, and non-controlling feedback (implicit prompts for correction), p < .001 for each. The effect size for the overall discrepancy between ideal and actual evaluative feedback was large, $\eta^2 = .23$, while the others were small to moderate (individual corrective $\eta^2 = .07$, non-controlling $\eta^2 = .09$). Post-hoc tests indicated that the only significant discrepancy for individual corrective feedback occurred among low-level students, who received more of this type of feedback than they would ideally have preferred. Post-hoc tests of ideal and actual non-controlling feedback (implicit prompts) showed that both lower- and higher-level students perceived that they received more of this type of feedback in reality than they would ideally.

Between-subjects ANOVA tests identified a small but statistically significant difference between the ideal amount of evaluative feedback desired by students of different levels and the actual praise they received, *F* (2, 102) = 6.723, *p* = .002, η^2 = .03. High-level students expressed the greatest preference for evaluative feedback, followed by low-level and then moderate-level students. However, the actual evaluative feedback received was lowest for the high-level group, slightly higher for the low-level group, and highest for the mid-level group. No other statistically significant discrepancies in ideal versus actual feedback according to students' self-reported ability level were identified. Table 4 presents the mean values and ANOVA results with post-hoc comparisons for each variable.

4.2. Open-ended questionnaires

4.2.1. Perceived features of ideal feedback and negative feedback

The open-ended questionnaires were coded according to the principles of SDT (Ryan & Deci, 2017). SDT was selected for its well-established framework outlining the effects of teachers' interactional styles on students' perceptions of the learning environment, as well as their subsequent motivation and learning (Bureau et al., 2022; Howard et al., 2021). Additionally, prior research within this framework provides valuable insights into teacher practices that foster autonomous motives (Ahmadi et al., 2023).

Teachers' behaviors were coded on the basis of established empirical studies of autonomy-supportive or controlling behaviors (Ahmadi et al., 2023; Reeve et al., 2022; Reeve & Jang, 2006). Across all categories of support and at all levels, it is worth noting that some students reported never receiving certain types of feedback investigated in the study. This was the single most common comment in the free responses, with 21 out of 112 students indicating that they had not received one or more of the studied types of oral feedback in their English classes. At the same time, all students reported having received at least one type of feedback. In large classroom settings, individual feedback interactions between teachers and students during each class period may be limited and, thus, may not be easily recognized at their perceptional level. The absence of specific feedback for some students contributed to the discrepancies observed in the quantitative model, offering an explanation of some of the results discussed above.

4.2.2. Perceptions of support

Students expressed that the feedback they received gave them a sense of joy, meaning, confidence, achievement, or personal connection, indicating that it supported their autonomy. This theoretically fulfills students' basic psychological needs for autonomy, relatedness, and competence (Reeve et al., 2022; Ryan & Deci, 2017), thereby contributing to a greater sense of motivation and well-being.

Higher-Ability Students: Students who rated their language ability higher than others noted that evaluative feedback granted them a sense of joy and confidence. According to Student H1, "It's more pleasant to be affirmed than to be praised in a subtle way." Explicit informational feedback was sometimes also perceived as a pathway to a sense of accomplishment, with Student H2 noting that "Once I could use correct English, I enjoyed speaking English very much." Descriptive feedback could have a confidence-granting effect, as Student H3 explained: "When I was able to express a satisfactory answer, I felt a sense of accomplishment." Moreover, individual corrective feedback was viewed as an opportunity to learn from teachers' expertise, as noted by Student H4: "I found it interesting that the teachers taught me things that I didn't know or didn't understand." Finally, students who received implicit informational correction sometimes viewed it as a valuable tool for building their language comprehension as Student H5 highlighted: "I realized the reason for the mistake and was convinced."

Average-Ability Students: Students who rated their language ability as average were similarly likely to perceive compliments as a source of confidence in the classroom: "I felt extra happy because my level has gone up now in high school" (Student A1). They saw explicit informational feedback as helpful insofar as "the teacher corrects problems with easy-to-understand explanations" (Student

A2). The specificity of the compliments given through descriptive feedback offered a source of meaningful joy, as noted by Student A3: "I was happy in general. I was also happy that the teacher understood my message." Similar to the higher-ability students, individual correction offered average-ability students the opportunity to interact with their teachers. Student A4 reported: "My teacher kindly answered my questions and was easy to understand." Students at this level were also likely to see the value of implicit informational correction, as noted by Student A5: "I learned the importance of recognizing my own mistakes."

Lower-Ability Students: Few students who assessed their language ability as lower than others reported having received praise. However, Student L1 commented, "I was happy to receive compliments." Some students also saw the value of explicit correction, as noted by Student L2: "I don't want to continue saying the wrong thing, so I am glad when my teacher points it out." Some of these students also appreciated the clarity of feedback from subjective evaluations: "I think it is better to give specific feedback on specifics" (Student L3). One lower-ability student also expressed appreciation for the level of care exhibited when the teacher offered individual correction: "I was glad to know that you cared about me" (Student L2). Finally, only one lower-ability student, Student L4, reported receiving a positive comment about implicit prompts for correction, noting that they now "[knew] the reason behind their mistake."

4.2.3. Perceptions of external control or need thwarting

Externally controlling or need-thwarting influences were noted as statements of frustration, worry, disconnection, anxiety, or confusion, perhaps stemming from a lack of clarity or a sense that their abilities were insufficient for the tasks being presented to them. These statements were viewed as obstacles to students' personal need for autonomy, relatedness, and competence, indicating that the oral feedback given was being interpreted as negative or unwanted.

Higher-Ability Students: While some perceived praise as supportive, others noted that praise alone lacked specificity. According to Student H6, "It wasn't specific, so I didn't know what I had done well." Several students echoed this complaint about explicit correction, noting "It was frustrating" (Student H7) and "I didn't know what the difference was even after the correction" (Student H8). No students at this level commented about descriptive feedback or individual corrective feedback; however, they expressed dissatisfaction with implicit informational feedback: "I was frustrated by my lack of vocabulary" (Student H3).

Average-Ability Students: Students of average ability noted that praise and evaluative feedback could occasionally result in selfsatisfaction or be perceived as controlling: "When they are praised, they believe in themselves and stop studying" (Student A6), and "I don't feel much of anything because it's what the teacher is supposed to say when you answer correctly" (Student A7). Students also indicated that explicit correction could contribute to a sense of lower competence, as Student A8 noted: "I'm afraid that what I say is no good." Regarding descriptive feedback, Student A9 expressed how this type of feedback could feel too commonplace: "I was often told this kind of thing, so I was not particularly concerned about it." Students could also be discomforted by individual corrective feedback, with Student A10 noting, "I'm a little uncomfortable being taught individually." Additionally, implicit prompts for correction could be seen as requiring too much time: "I had some questions that I wanted to answer quickly" (Student A7).

Lower-Ability Students: Students in the lower ability group sometimes interpreted praise as disingenuous or unnecessary based on their perception of their level of ability: "No matter how much I was told, it did not inspire confidence" (Student L5); "It's better than nothing being said, but I don't see what the point is" (Student L3). Regarding explicit correction, Student L5 noted: "I was a little uncomfortable with the way they pointed it out." Further, Student L3 noted frustration that explicit correction might be preferable to subjective evaluation, saying "Frankly, I'd rather have specific feedback than a brief evaluation." Students at this level also appeared to be keenly aware of their challenges with English when receiving individual corrective feedback, with Student L6 stating: "As someone who doesn't understand English, I'm glad if someone can tell me the answer, but I don't know if it's a good idea." Finally, students at this level felt that receiving the correct answer might be more efficient than receiving implicit informational feedback: "I don't think it's much different than when I was answered. It can feel a little long and annoying" (Student L4).

4.2.4. Perceived feedback to promote learners' SRL

4.2.4.1. Promotion of self-regulatory functioning. The students' comments regarding self-regulation reflected the idea that feedback can provide a means of encouraging adaptive functioning and uptake. Statements were interpreted as self-regulatory if they referred to ideas about the development of higher-level skills (metacognitions, strategies), or offered potential ways to solve problems independently and without teacher assistance. Across all levels, the students noted that certain types of instruction—specifically prompts—promoted proper language use. Students indicated that feedback encouraged them to be aware of their own mistakes, and resolve these mistakes moving forward. As Student H9 noted: "When the teacher asks, 'Was that the right way to say it?' it can be a helpful learning experience." Average- and low-level students echoed the sentiment that prompts are effective for self-driven correction, stating: "I believe that by being prompted, we can learn to think" (Student A9), and "I think it is important to come up with our own answers," (Student L7). These students acknowledged the important role of feedback and correction in improving their oral production. Beyond mere motivation, they recognized that feedback offers a pathway to better manage future errors and, ultimately, achieve self-improvement.

4.2.4.2. Insufficiencies of feedback for self-regulatory functioning. Some students expressed that the feedback they received did not always support their learning process. These perceptions were often linked to instances where instruction failed to encourage independent action or improve cognitive and metacognitive skills, particularly when feedback was embedded in praise. For example, Student H10 stated, "I think the teacher should giving specific instructions on the problems to improve our thinking abilities. I also think the teacher should point out more where we did well and where we need to improve a bit more." This student felt that the

feedback they received was insufficient to foster self-regulatory improvement.

Other students expressed a clear dislike for the increased requirements for time and attention associated with certain types of feedback. For instance, Student A7 remarked, "I dislike when I am led to answer on my own a bit because it makes the time to speak longer when I am chosen," indicating a belief that simply receiving feedback should be sufficient to facilitate uptake. Additionally, some students preferred highly specific explanations of linguistic or grammatical points, as highlighted by Student A8: "I would like to see more explanations such as 'this is why we are using \sim ing in this case." Similarly, as Student L4 noted above regarding implicit informational feedback, prompting change without clarifying its purpose can lead to frustration.

5. Discussion

5.1. The relationship between students' proficiency, perceived motivational effect on motivation, and feedback preference

Structural equation modeling revealed that students' motivation to receive different types of feedback in junior high school and high school was highly correlated. However, their proficiency predicted only their current (high school) motivations. Neither motivations nor prior abilities predicted students' preferences for specific types of feedback, though prior ability strongly predicted their ultimate achievement. Feedback preferences—defined as the discrepancy between students' ideal feedback and the actual feedback they received— were found to predict ultimate achievement. This suggests that a greater difference between the students' ideal feedback and the feedback they actually receive may have a positive learning effect. Moreover, reflections on motivational experiences from junior high school significantly predicted test scores, highlighting the potential importance of early experiences in learning English.

According to within-subjects ANOVA tests, the most significant differences were observed in preferences for evaluative feedback (praise), individual corrective feedback, and implicit informational correction (elicitation). The largest overall difference was students' strong preference for praise compared to a relative aversion to individual correction or elicitation of self-correction. Students' perceived proficiency level had a very small effect on these differences; while not indicative of complete equality, this points to a relative consistency of effect across ability levels.

Synthesizing the quantitative findings, students' preference for praise and relative disinclination toward feedback intended to elicit change suggest that praise and evaluative feedback may have less impact on learning than other forms of feedback. A greater discrepancy between ideal and actual feedback was associated with higher test scores, indicating that receiving less perceived praise and more perceived correction was more predictive of learning outcomes. Post-hoc tests and the confidence intervals of the different groupings show that higher-level students reported the greatest discrepancies between ideal and actual praise and implicit prompts for correction. However, similar preferences for praise and reward over individualized correction or the elicitation improvements to spoken English through feedback were observed across other proficiency levels.

5.2. Students' perceived feedback to promote learners' self-regulated learning

Students at each perceived proficiency level acknowledged the value of different forms of feedback, though some occasionally found certain types undesirable (see section 4.2). While many students appreciated praise and recognized the helpfulness of corrective feedback, some, consistent with prior research (Hattie, 2012; Kerr, 2020), expressed concerns about being controlled by disingenuous praise or correction that was embarrassing, inefficient, or beyond their comprehension level.

Combining the qualitative findings with the quantitative results suggests that while receiving praise is enjoyable, slightly less pleasant but more formative feedback—such as individual correction and elicitation of repair—may lead to more concrete learning gains. While praise can improve students' perception of the classroom as a pleasant and engaging environment, some degree of discomfort or challenge may be necessary to encourage meaningful growth. As Kerr (2020) aptly stated, "Learning from feedback cannot be forced: the teacher's task is to try to create the right conditions for learning to take place" (pp. 13–14).

Students across all levels indicated that all forms of feedback could be perceived as either supportive or controlling (see sections 4.2.2 and 4.2.3). While this finding does not offer concrete implications for theory or practice, it underscores the complexity and challenge of providing effective feedback to diverse learners. Notably, approximately one in five students reported never having received a particular type of feedback, highlighting potential difficulties caused by larger class sizes in many Japanese schools. Although feedback is recognized as an essential aspect of the learning process (Hattie & Timperley, 2007), its uneven delivery can contribute to the variability and complexity of classroom experiences.

Students across all levels also recognized that feedback promoted self-regulation and the ability to produce correct answers independently. As noted in section 4.2.4, several students emphasized the importance of correction in developing better thinking skills. However, not all students appreciated the time and effort required for such corrections. This leads us to infer that feedback is a natural aspect of the classroom experience and part of the teacher's job. Some students preferred straightforward and brief feedback that does not require direct and immediate action or extend speaking time in class, as expressed by Student L4. Despite this, the value of prompts to foster independent learning and uptake of feedback was widely acknowledged.

These findings suggest that while more positive evaluative feedback and praise may not directly drive learning outcomes, prompts encouraging self-correction are essential. This aligns with meta-analytic observations by Hattie (2023, p. 324; see also Hyland & Hyland, 2019). At the same time, motivational support through effective praise and evaluative feedback helps to create a learning environment in which students are receptive to feedback (Cornelius-White, 2007). While it is beyond the scope of this study to disentangle the effects of motivational versus instructional feedback, the findings support the idea that both are critical to effective

classroom learning. This is consistent with the notion that instructional clarity and organization create the form of the lesson, while a supportive classroom environment describes the quality of instruction provided (Oga-Baldwin & Nakata, 2020). Both elements are observable, trainable (Reeve & Cheon, 2021; Reeve et al., 2022), and essential for fostering student learning and achievement.

Quantitatively and qualitatively, these results confirm and extend prior theoretical and empirical work. Hattie (2012) identified three essential elements of feedback for teachers: awareness of the learning task, process, and self-regulation; differentiation between praise and information; and effective timing of feedback delivery. Similarly, Kerr (2020, pp. 3–4) highlighted key characteristics of effective feedback for L2 development. These findings corroborate the distinct yet interconnected roles of different types of feedback in promoting SRL and achievement (Bitchener et al., 2005). While students may prefer feedback that offers praise and positive reinforcement, the real value of feedback lies in its ability to promote repair, action, and meaningful growth.

5.3. Limitations and future directions

Several limitations and caveats must be considered regarding these findings. First, this study has not fully unveiled the mechanisms of self-regulated language learning or the feedback loop through which students perceive teacher feedback and translate it into action (Zimmerman & Schunk, 2011). The study focuses more specifically on the affective (motivation) and cognitive aspects than on the behavioral aspects of self-regulation. While these findings highlight quantitative and qualitative relationships between students' interpretations of feedback and the ultimate achievement linked to those interpretations, additional self-regulatory processes beyond knowledge uptake remain unexplored. Future research should delve deeper into the relationship between feedback and the behavioral and metacognitive aspects of self-regulated language learning.

Second, the study's generalizability and representativeness are limited by the sample size, which was drawn from a single Japanese school. Expanding the sample to include a broader range of students in future studies will help to confirm these findings. Additionally, the reliance on retrospective data (i.e., high school students' recollections of their junior high school experiences; De Vaus, 2001) may not provide perfectly accurate insights over time. However, the qualitative perspectives offered by individuals regarding their past experiences remain valuable (Creswell & Poth, 2018).

Finally, given the exploratory nature of this study, future research can build on these results to develop testable hypotheses and conduct confirmatory analyses. This will contribute to further investigation of the relationships between praise, feedback, motivation, and achievement and provide a more comprehensive understanding of their interplay.

6. Conclusion

This study presents a longitudinal investigation into students' perceptions of different types of feedback and their relationship to learning. The findings highlight the importance of both praise and correction in fostering self-regulation and the acquisition of new knowledge. Students who receive an appropriate balance of feedback—regardless of whether it aligns with their preferences or "ideal" feedback type—appear to be more likely to achieve higher learning outcomes. Just as a sustainable, healthy diet includes lean, nutritious foods with occasional high-calorie indulgences, allowing for both enjoyment and appropriate nutrition, students benefit from a balanced classroom environment. This balance combines motivating positive praise with formative (though sometimes less enjoyable) correction. Striking this balance is a key challenge for experienced teachers, with success leading to a virtuous circle of achievement.

CRediT authorship contribution statement

Yoshiyuki Nakata: Writing – original draft, Visualization, Supervision, Conceptualization. **W.L. Quint Oga-Baldwin:** Writing – original draft, Visualization, Software, Formal analysis, Data curation. **Atsuko Tsuda:** Writing – review & editing, Investigation, Data curation.

Data availability

The datasets generated during and/or analysed during the current study are not publicly available due to privacy concerns but are available from the corresponding author on reasonable request.

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Appendix A. Supplementary data

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Yoshiyuki Nakata is a professor of English language education at Doshisha University. His research interests include language learning motivation, self-regulation and teacher/learner autonomy in the Japanese EFL context.

W. L. Quint Oga-Baldwin is a professor at Waseda University. His research interests include motivation, graphene-phoneme acquisition in elementary schools, and gamified learning.

Atsuko Tsuda is an associate professor at the University of the Ryukyus. Her research interests include English language education, self-regulated learning, and elementary school English.