PRONUNCIATION LEARNING STRATEGIES AND MOTIVATION: THEIR IMPACT ON SECOND LANGUAGE SPEECH OF JAPANESE EFL LEARNERS

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Abstract

Despite increased academic interest in the factors related to individual differences in second language (L2) pronunciation, little is known about how motivated learners utilise pronunciation learning strategies (PLS) to master the target language sound system. Grounded in the self-regulated learning model, this study examined the interplay between PLS and motivation in shaping L2 comprehensibility among 103 learners in Japan. The participants completed a questionnaire that assessed their individual differences in PLS and motivation and undertook a test that measured their L2 comprehensibility. An exploratory factor analysis revealed a two-factor model consisting of PLS and motivation, which was further analysed using Pearson correlation and structural equation modelling. The analysis showed a statistically significant correlation between PLS and L2 comprehensibility, and between motivation and PLS, whereas the correlation between motivation and L2 comprehensibility was not statistically significant. The structural analysis revealed that motivation exerted a significant effect on L2 comprehensibility through PLS, with PLS being a predictor of L2 comprehensibility. Highlighting the often neglected importance of PLS, the findings suggest that the participants were motivated and goal-oriented, which led to their use of PLS. This implies that PLS use and motivation were significant factors in improving L2 comprehensibility in the classroom.

Keywords: pronunciation learning strategies, motivation, L2 comprehensibility, L2 pronunciation, structural equation modelling

1. Introduction

Over the past two decades, there has been a global shift in L2 pronunciation, from sounding like native speakers of English to sounding understandable. In this sense, whether a speaker is a native or non-native no longer matters (Derwing & Munro, 2015; Levis, 2018). With this shift in L2 pronunciation instruction, helping L2 learners attain comprehensible speech has become a realistic goal for practitioners

and researchers alike. L2 comprehensibility, often defined as '[T]he ease or difficulty a listener experiences in understanding an utterance' (Derwing & Munro, 2015, p.5), has become a primary focus in L2 pronunciation learning and teaching (Saito, Dewaele, Abe, & In'nami, 2018; Sardegna, Lee, & Kusey, 2017). Scholarly discussions have also focused on which Individual Differences (IDs) are related and which factors might accelerate learning of L2 pronunciation. Motivation is one of those variables that have gained the most scholarly attention in Second Language Acquisition (SLA) studies (Al-Hoorie, 2018). However, '…correlational studies permit only relatively weak conclusions and disallow causal interpretations' (Derwing & Munro, 2015, p.45). Some studies have argued that other variables play a role in linking motivation and L2 pronunciation (Moyer, 2004; Segalowicz, Gatbonton, & Trofimovich, 2009), but it is unclear which variable(s) is (are) direct predictor(s) of learning success.

This article aims to highlight PLS as a mediator between motivation and L2 comprehensibility in adolescent learners in Japan within the framework of self-regulated learning (SRL) (Zimmerman, 2008). In educational psychology, SRL is generally understood as 'an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, control their cognition, motivation, and behaviour, guided and constrained by their goals and contextual features of the environment' (Pintrich, 2000, p.453). This construct came into the field of language learning strategies (LLS) studies as a critical element in the last decade (Oxford, 2017; Rose, Briggs, Sergio, & Ivanova-Slavianskaia, 2017). Zhang, Lin, Zhang, and Choi (2017) attempted to deploy this framework and found that motivation and LLS are not isolated factors but rather closely interrelated in the effects of L2 vocabulary learning and its attainment: 'While it is critical that we understand why students learn L2 vocabulary […] and how they actually do so […], it is probably even more important to explore how these 'why' and 'how' factors work together' (Zhang et al. 2017, p.58). Thus, a triadic model, previously proposed in L2 vocabulary, warrants further investigation in L2 pronunciation as well. If a link were to be identified, researchers and practitioners alike would be able to help learners successfully improve L2 comprehensibility in the classroom.

The next section presents a review of relevant studies that have considered the relationships among PLS, motivation, and L2 comprehensibility. It also reviews prior SEM analyses in SLA which have scrutinise the possibility of the joint influence of LLS and motivation in studies of SLA within a SRL framework, followed by methodology, findings and discussion, with implications for further study.

2. Literature Review

2.1. Motivation and L2 Comprehensibility

'Motivation is responsible for *why* people decide to do something, *how long* they are willing to sustain the activity, and *how hard* they are going to pursue it' (Dörnyei & Skehan, 2003, p.614). Its significant role in SLA is widely acknowledged, and there is growing interest in L2 pronunciation research as well, exploring the predictability of attainment (Moyer, 1999; Smit, 2002; Richter, 2019). For instance, Moyer (1999) working with highly motivated learners of L2 German, demonstrated that motivation is a statistically significant predictor of pronunciation attainment. However, while many scholars claim that motivation is important in L2 pronunciation learning, few studies have reported statistically significant correlations with learning success.

Recent research on L2 pronunciation has been conducted within Dörnyei's (2005, 2009) framework of motivation, the L2 Motivational Self System (L2MSS). The three fundamental elements in L2MSS are the Ideal L2 self, the Ought-to L2 self, and the L2 learning experience. According to Dörnyei (2009), the Ideal L2 self is 'the L2 specific facet of one's ideal self' (p.29). It can serve as a motivator to bridge a gap between one's current proficiency level and their ideal level if one observes a gap in their L2 learning experiences. The Ought-to L2 self refers to 'the attributes that one believes one ought to possess to meet expectations and to avoid possible negative outcomes' (Dörnyei, 2009). Thus, obligation, expectation from others, etc. may serve as a strong motivator in L2 learning. The third element, L2 learning experience, refers to 'situated, executive motives related to the immediate learning environment and experience' (Dörnyei, 2009). This element could motivate learners when they feel excited in the classroom, when they experience good relationships with other peers, and so forth.

Studies in L2MSS on L2 pronunciation are limited (Baran-Łucarz, 2017; Nagle, 2018; Saito, et al., 2018), and the results are mixed. Saito et al. (2018) investigated whether motivation predicted attainment in L2 comprehensibility for 108 secondary school English as a foreign language (EFL) learners in Japan. The regression analyses revealed that the ideal L2 self predicted the outcome of comprehensible speech in the L2 classroom. Around the same period, Nagle (2018) examined the longitudinal development of 26 L2 Spanish learners and their correlation with motivation-related data but found little correlation between motivation and L2 comprehensibility. Although research in L2 pronunciation pedagogy is limited, the mixed results suggest that motivation alone is insufficient to predict learning attainment (Oxford, 2017; Pintrich & de Groot, 1990), as 'motivation is a concept that explains why people behave as they do rather than how successful their behaviour will be' (Csizer & Dörnyei, 2005, p.20). This study does not disregard motivation in L2 learning experiences, instead, it seeks to find an alternative way that motivation and attainment could be potentially linked through the mediation of PLS.

2.2. PLS and L2 Pronunciations Attainment

PLS are 'goal-oriented processes manifested in the form of actions and thoughts, selected consciously from an available array with the aim of improving specific aspects of an L2 pronunciation' (Szyszka, 2023, p.101). The 'actions and thoughts' are critical elements in PLS, which makes learning strategies, i.e. both LLS in general and PLS in particular, unique among all ID variables in SLA. PLS studies over the past two decades have focused on describing and classifying learners' actions and thoughts, with several classification models proposed (see Szyszka, 2017, for a comprehensive survey). To analyse various classification models from a common angle, this study adopts Griffiths' (2018) definition with two broad classifications, Cognitive and Metacognitive: The `action' element refers to activities that a learner selects to engage directly with the learning material to develop knowledge or understanding, i.e. cognitive strategies. The 'thought' element encompasses metacognitive strategies, which involve managing, supervising, or controlling the learning process and operate at an indirect level above direct cognitive strategies.

Research on the correlation between learners' use of PLS and pronunciation attainment has been limited but has received some attention, demonstrating that PLS use appears to impact the development of learners' pronunciation ability (Baker-Smemoe & Haslam, 2013; Berkil, 2008; Eckstein, 2007; Véliz-Campos, 2015). One line of inquiry is proposed by Berkil (2008), which followed Oxford's (1990) classification, subdividing PLSs into memory PLS, cognitive PLS, compensation PLS, metacognitive PLS, affective PLS, and social PLS. Developing the Strategy Inventory for Learning Pronunciation (SILP), Berkil (2008) conducted an experiment that involved 40 Turkish EFL learners with various proficiency levels at a university in Turkey, and revealed a significant correlation between two PLS and learners' pronunciation ability, specifically the cognitive PLS, 'I listen to tapes, movies, or music in English' and 'I purposefully focus my listening on particular sounds'. The other group developed the Strategic Pronunciation Learning Scale (SPLS), based on Kolb's (1984) learning cycle model. Eckstein (2007) examined the correlation between PLS and their pronunciation ability, with 183 overseas students of varying proficiency levels. The analyses revealed a positive and significant correlation between L2 speaking ability and two cognitive and one social PLS, for example 'noticing pronunciation mistakes', 'adjusting facial muscles while speaking', and 'asking for help with the pronunciation of new English words'. Likewise, Baker-Smemoe and Haslam (2013) investigated the relationships among learning contexts, language learning aptitude, and L2 pronunciation gains. The use of PLS among 60 participants in the US and China yielded findings with a statistically significant correlation between cognitive PLS and learners' phonetic performance. For example, 'I put together sounds of individual letters of words to sound-out words I don't know how to pronounce' and 'I change my speed of speech if people don't understand my pronunciation'. In a study conducted by Veliz-Campos (2015) with 40 pre-

service teachers at a university in Chile, a positive and statistically significant relationship was found between cognitive and metacognitive PLS and L2 intelligibility levels. Examples include 'I listen for new sounds when listening to people speak English', and 'When I feel bored with learning English pronunciation, I regulate my mood to invigorate the learning process'. Thus far, previous studies have demonstrated that there is a statistically significant correlation between PLS and attainment of learners' pronunciation ability. However, whether PLS could be an immediate predictor of L2 pronunciation is still unclear (Pawlak & Szyszka, 2018). Therefore, in the next section, this study approaches the cause-and-effect problem of PLS, motivation, and L2 comprehensibility by considering several studies in other academic fields that found LLS mediate between motivation and learning success.

2.3. Linking LLS/ PLS use, Motivation, and L2 Attainment

Recent LLS studies used SEM to uncover causal relationships among latent and observable variables, including L2 learning achievement (Ardasheva, 2016; Teng & Zhang, 2016, 2018; Tseng & Schmitt, 2008; Zhang et al., 2017). To reveal the mechanisms through which learners work towards their goals, Zhang et al. (2017) laid the groundwork for research in this field and investigated a triadic model of vocabulary learning strategies (VLS), motivation, and L2 vocabulary knowledge, demonstrating that VLS was a significant predictor of L2 vocabulary knowledge.

Following this line of inquiry, several inquiries investigated linking motivation and L2 vocabulary knowledge with VLS (Akase ,2023; Choi, Zhang, Lin, & Zhang, 2018; Lee, Ahn, and Lee, 2022). Choi et al. (2018) showed VLS was a significant predictor, and had a significant causal association between motivation and VLS with 36 % of variance. Among path coefficients, the strongest and most significant path was from VLS to L2 vocabulary knowledge in Choi et al. (2018), and Zhang et al. (2017), while the path coefficients from motivation to attainment was significant in Zhang et al. (2017), and not significant in Choi et al. (2018). The two studies also revealed the indirect effects of motivation on L2 vocabulary knowledge mediated by VLS, which was statistically significant. L2 VLS studies, so far, have shown that VLS is a direct predictor and mediates between motivation and L2 vocabulary attainment.

However, in L2 pronunciation research, few studies have demonstrated that PLS can be a significant predictor of attainment in L2 pronunciations. Notably, Sardegna, et al. (2018) proposed their SEM model to show that efficacy and attitudes were direct predictors of PLS, based on data from 750 Korean adolescent EFL learners. The study successfully demonstrated that efficacy and attitudes predict PLS. However, it did not investigate whether the use of PLS predicts L2 pronunciation attainment. To the best of the author's knowledge, little is known about how motivation and the use of PLS interact in influencing L2 pronunciation learning success, and the extent to which PLS impacts L2 comprehensibility, which motivated the present study.

3. Present Study

This study aimed to examine how motivated learners use PLS to approach comprehensible speech in EFL. Figure 1 shows this study's hypothesised SEM model, in which a triadic model of L2 comprehensibility, PLS, and motivation is provided. The model examines the direct path coefficients: 1) motivation → L2 comprehensibility, 2) motivation → PLS, 3) PLS → L2 comprehensibility, and the indirect path coefficient, 4) motivation → PLS →L2 comprehensibility. Two research questions (RQs) guided this study.

RQ1: Does PLS exert a direct effect on L2 comprehensibility?

RQ2: If yes, to what degree does PLS predict the attainment of L2 comprehensibility, and what role does motivation play in the structural relationship?

Figure 1. A hypothesised SEM model among the constructs
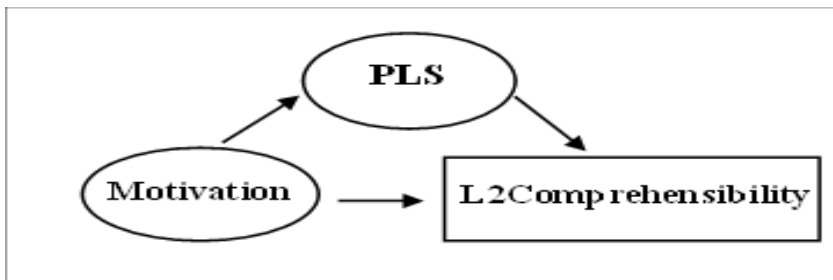
3.1. Participants

The participants were 116 technical college students who consented to take part in the experiment. They had Basic User (A level) proficiency in English, according to the Common European Framework of Reference of Languages (CEFR). Although all participants attended the research programme initially, thirteen participants were eliminated due to their absence at the time of the recording and/or the low quality of the recording, for example, when the recorded performance was full of noise, or silence, which hindered scoring by the rater(s). The final sample consisted of 103 learners (15 girls, 14.56% and 88 boys, 85.44%), which roughly corresponds to the rate of boys and girls at all 57 national colleges in Japan. Japanese national colleges are tertiary educational institutions for 15-year-old boys and girls with outstanding knowledge and performance in science and engineering. Consequently, students entering college have mostly been boys for sixty years since this college system launched in Japan. Several studies, conducted at other national colleges in Japan, report a high rate of boys, e.g. approximately 80% in Akase (2023) and 'mostly male students' in Tanaka (2017, p.132). Since the participation in the research experiment was on a voluntary-basis, the high rate of boys seems inevitable.

3.2. Instruments

3.2.1 Measuring L2 comprehensibility

To measure learners' ability in L2 comprehensibility, the Kawaijuku English Test-Speaking (KJET-S), a computer-based test and an officially approved EFL proficiency examination for English-language speaking in Japan, was adopted. Using a tablet, each participant answered six questions, which covered:

1) Self-introduction (5 points)
2) Reading a passage (5 points)
3) Question-and-answer-type questions (5 points)
4) A picture-description question (5 points)
5) A discussion question (5 points)

Each question was measured on a scale ranging from 0 (*impossible to understand*) to 5 (*extremely easy to understand*). One question was excluded because it only assessed the content, not comprehensibility. Participants answered all questions (provided by a designated speaker) using a tablet; the recorded answers were sent to the US and were assessed by a professional native speaker recruited by the KJET-S.

3.2.2.Measuring PLS and Motivation

The motivation questionnaire was based on the Japanese version (Saito et al., 2018) of the L2MSS (Dörnyei, 2005, 2009), which was designed to assess various aspects of motivation. Participants rated the degree to which they agreed with each of the statements using a 6-point Likert scale. The questionnaire included eight items covering both the Ideal L2 Self (which comprised items 9, 15, 19, and 23) and the Ought-to L2 Self (which comprised items 6, 11, 14, and 21) (cf. Appendix).

To survey participants' PLS use, a composite questionnaire in Japanese was developed based on PLS literature (Szyszka, 2017), which was rearranged using Griffith's (2018) classification. It included twenty items: Cognitive PLS (items 1, 3, 5, 7, 8, 20, 24, 25, 28, and 31), and metacognitive PLS divided into 1) Supervisory PLS (items 17, 26, 29, and 33), 2) Affective PLS (items 2, 12, and 18), and 3) Social PLS (items 4, 10, and 13). Since Szyszka's (2017) PLS, which is in line with Oxford (1990) and Berkil (2008), does not possess metacognitive PLS that concerns goal-orientation, initial appraisal of pronunciation learning, commitment control, environment control, all of which appear to be critical PLS to keep oneself motivated. This study attempted to add five items from Teng & Zhang (2016), and Tseng & Schmitt (2008), with modification to ask participants' L2 pronunciation learning experience (items 16, 22, 27, 30, and 32) (cf. also Appendix).

3.3. Data Collection, Procedure and Analysis

The study was conducted at a technical college in a rural city in Northern Japan. Participants answered motivation and PLS questionnaires for thirty minutes, followed by the KJET-S test. The data were analysed using IBM SPSS Statistics 25 software. To address RQ1, an exploratory factor analysis (EFA) was conducted using the maximum likelihood method with Promax rotation. This approach was taken to eliminate items that loaded significantly on more than one factor. Additionally, variables that met two criteria were retained: having factor loadings greater than .40 and eigenvalues exceeding 1.0.

All participants were given an explanation on the nature and objectives of the research programme at the beginning. They were fully informed that their participation was on a voluntary-basis, that they had the right to leave at any stage of the experiment if they wished to do so, and lastly, the results of KJET-S had nothing to do with their normal class EFL grade. The collected data have been kept confidential to protect their privacy.

Descriptive statistics and Cronbach's alpha coefficients were also estimated, yielding a two-factor solution that accounted for 43.67% of the variance. The Kaiser-Meyer–Olkin test of sampling adequacy was .729 (fair), while Bartlett's test of sphericity yielded a significant result ($\chi^2 = 243.79$, p < .000), indicating an adequate structure for further analysis. This finding supports answering RQ2 via SEM using IBM Statistics AMOS 25. SEM illustrates the relationships of latent and observable variables. This includes depicting causal relationships, correlations, and indirect variable relationships, which regression analyses do not calculate (Kline, 2016).

4. Findings and Discussion

4.1. Descriptive Statistics and Correlations

Table 1 presents the results of the EFA, and a two-factor model, consisting of PLS and motivation. Thirty-three items were grouped into two factors, each comprising several related items. The six items involved in Factor 1 (items 16, 25, 27, 28, 30, and 31) with a Cronbach's alpha of .75, were all associated with PLS use: These items were further categorised into cognitive PLS (items 25, 28, 31) and metacognitive PLS (items 16, 27, 30). The second factor included three items associated with motivation: two items representing the ideal L2 self (items 19, 23) and one item related to attitude (item 32), achieving a Cronbach's alpha of .75.

Table 1. Standardised Factor Loadings and Inter-factor Correlations
from Explanatory Factor Analysis

Items	Factor I: PLS (α=75)	Factor II: Motivation (α=.77)	Uniqueness
PLS 16	.69	.15	.44
PLS 25	.60	-.08	.67
PLS 27	.55	-.03	.71
PLS 28	.48	.05	.75
PLS 30	.61	.01	.62
PLS 31	.51	.03	.75
Motivation 23	-.04	.87	.27
Motivation 19	-.13	.79	.29
Motivation 32	.25	.57	.55
Inter-factor correlation		.32	

Note. α = Cronbach's alpha.

Table 2 shows the descriptive statistics for participants' performance on the KJET-S test, along with descriptive data for each selected item in PLS and motivation. The average score for L2 pronunciation attainment is 12.95 points, a success rate of about 52 %. Therefore, a 50 % score is considered adequate for basic level learners according to the CEFR.

Table 2. Descriptive Statistics on L2 Comprehensibility, PLS, and Motivation

	M	SD	Skewness	Kurtosis
L2 comprehensibility	12.95	2.65	.19 (0.24)	-.59 (0.47)
PLS 25	2.94	1.36	.42 (0.24)	-.57 (0.47)
PLS 28	3.17	1.24	.03 (0.24)	-.65 (0.47)
PLS 31	2.76	1.46	.53(0.24)	-.71(0.47)
PLS 16	3.14	1.45	.39 (0.24)	-.69 (0.47)
PLS 27	3.90	1.24	.001 (0.24)	-.65 (0.47)
PLS 30	3.34	1.33	-.09 (0.24)	-.64 (0.47)
Motivation 23	4.62	1.21	-.64 (0.24)	.03 (0.47)
Motivation 19	3.71	1.41	-.15 (0.24)	-.80 (0.47)
Motivation 32	4.94	1.03	-.20 (0.24)	-.78 (0.47)

Note. M = mean; *SD* = standard deviation

The data set was analysed using Pearson correlation coefficients, yielding low-to-moderate, yet statistically significant correlations regarding certain combinations of PLS, motivation, and L2 comprehensibility, as shown in Table 3. Although the correlation values are relatively low, Dörnyei notes, '[…] in applied linguistics research, we can find meaningful correlations of as low as 0.3–0.5 […] if two tests correlate with each other in the order of 0.6, we can say that they measure more or less the same thing' (2007, p.223). Therefore, in this study, correlation coefficients nearing these thresholds are deemed an acceptable degree.

The Pearson correlation analysis revealed an acceptable, but moderate correlation between PLS, motivation, and L2 comprehensibility. Notably, the correlations included: First, metacognitive PLS and L2 comprehensibility ($r = .31^{**}$), second, cognitive PLS and metacognitive PLS, ($p < 0.01^{**}$), and third, metacognitive PLS and motivation at ($p < 0.01^{**}$). The correlation between motivation and comprehensibility was negligible. The correlation between PLS and comprehensibility was a little lower than the .40s level found by Baker-Smemoe and Haslam (2013) and mid .30s level reported by Véliz Campos (2015). However, the positive and significant correlation coefficients are sufficient to support causal relationships in SEM.

Table 3. Correlations among Variables Selected after Exploratory Factor Analysis with L2 Comprehensibility

	1	2	3	4	5	6	7	8	9	10
1. L2Comp	1									
2. PLS 25	.12	1								
3. PLS 28	.12	.27**	1							
4. PLS 31	.20*	.34**	.17	1						
5. PLS 16	.31**	.36**	.45**	.37**	1					
6. PLS 27	.06	.37**	.26**	.30**	.34**	1				
7. PLS 30	.20*	.36**	.25*	.28**	.47**	.36**	1			
8. MOT 23	.06	.05	.15	.08	.29**	.08	.14	1		
9. MOT 19	.09	.10	.18	.11	.36**	.09	.22*	.72**	1	
10. MOT 32	.12	.15*	.14	.09	.23*	.16	.12	.55**	.33**	1

Note. L2Comp = L2 comprehensibility, PLS = pronunciation learning strategy, MOT = Motivation

4.2. Contributions of Use of PLS and Motivation to L2 Pronunciation Attainment

The present study extended the findings from research on L2 vocabulary acquisition, specifically the role of VLS as a mediator between learners' motivation and their L2 vocabulary knowledge (Akase, 2023; Choi, et al., 2018; Lee, et al., 2022; Zhang, et al., 2017) and applied this to L2 pronunciation learning. Before answering the RQs, we ensured the proposed model was well supported by the response data, as shown in Table 4 and Figure 2. Within this model, six items loaded significantly on the latent variable of PLS (β =.49~.77, $p < .001$), and three items loaded significantly on the latent variable of motivation (β =.41~.84, $p < .05$).

Table 4. Models' Goodness of fit Indices

	χ^2	Df	χ^2/df	p	GFI	TLI	CFI	RMSEA	SRMR
Good fit			$\leqq 2$	$>.05$	$\geqq.90$	$\geqq.90$	$\geqq.90$	$\leqq.05$	$\leqq.08$
Proposed Model	27.80	32	0.87	.68	.95	1.02	1.00	.00 (.00-.06)	.056

Note. χ^2 = chi-square values; GFI = goodness of fit index; TLI = Tucker–Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual.

Figure 2. The final model with observed variables and standard error deviations
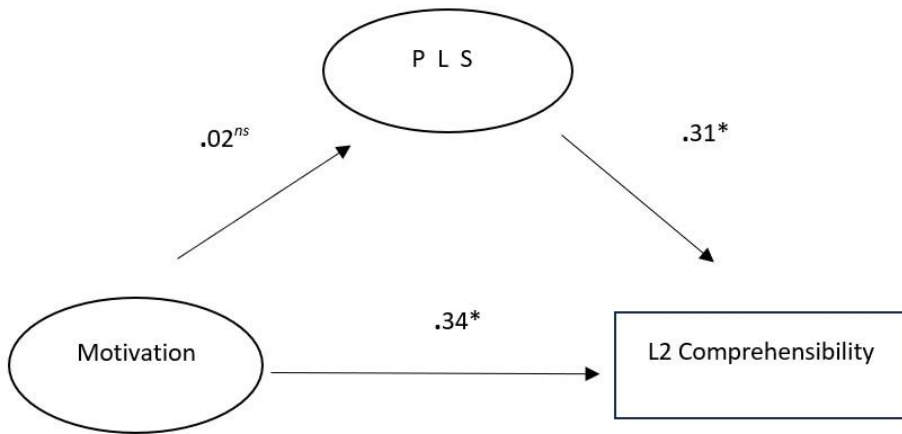
Regarding RQ1: *Does PLS exert a direct impact on L2 comprehensibility?* The answer is *yes*. Table 5 presents the standard total effect, denoted by *β*, which measures the strength of influence from one factor to another. The total effect of PLS use on L2 comprehensibility was significant, while that of motivation was negligible and non-significant. Similarly, the impact of motivation on PLS was positive and significant, (β =.34, $p < 0.05^{*)}$). The findings suggest that PLS significantly impacts L2 comprehensibility, which is in line with Zhang et al. (2017) and Choi et al. (2018): Specifically, the direct path coefficient from PLS to L2 comprehensibility was significant (β =.31, $p < 0.01^{**)}$), while the coefficient from motivation to L2 comprehensibility was small or negligible (β =.02, p =.85^{ns}).

RQ2 was: *If yes, to what degree does PLS predict the L2 comprehensibility, and what role does motivation play in the relationship?* First, the R^2 value in PLS was .12, while that in PLS was .11. The R^2 value in L2 Comp might appear small (Plonsky & Ghanbar, 2018), the R^2 values in SLA research seem to be around .15, according to Rose, et al. (2018). Therefore, the R^2 value in the current study is considered adequate, indicating that PLS effectively mediates the influence of motivation on L2 comprehensibility.

Second, the indirect path coefficient from motivation to L2 comprehensibility mediated by PLS was β =.11, $p < 0.12^{ns}$, which implies that motivation's direct impact might be negligible. The role of motivation becomes more distinctive, approaching statistical significance (from p = .85 to p = .12) when mediated by the latent variable PLS, indicating the indirect effect of motivation on L2 comprehensibility. Therefore, this study suggests that motivation and PLS are not isolated factors but rather closely interrelated in influencing L2 pronunciation learning and its attainment.

Table 5. Parameter Estimates of PLS and Motivation on L2 Comprehensibility

			Direct effects		Indirect effects		Total effects		
			β	p	β	p	β	p	R^2
Motivation	→	L2 comprehensibility	.02	$.85^{ns}$	.11	$.12^{ns}$	.13	$.85^{ns}$	.11
PLS	→	L2 comprehensibility	.31	<.05*			.31	<.05*	
Motivation	→	PLS	.34	<.05*			.34	<.05*	.12

Note. PLS = pronunciation learning strategies

5. Conclusion

This study explored the links among PLS, motivation, and L2 comprehensibility, hypothesising that PLS and motivation work in tandem to achieve comprehensible speech in L2 learners. The results of SEM analysis demonstrated:

(1) that PLS was a significant DIRECT predictor of L2 comprehensibility

(2) that motivation exerted an INDIRECT impact on L2 comprehensibility

(3) PLS played a mediating role between motivation and L2 comprehensibility.

This study might be the first to investigate the structural relationships among PLS, motivation, and L2 comprehensibility. However, the study has several limitations. The study sample was small, and future studies should include larger samples to confirm the integrity of the findings (In'nami, 2014), and the participants were mostly male, which may have influenced the outcome of the present study (Sardegna et al., 2018). Furthermore, PLS use is dynamically linked to the task provided in the classroom (Pawlak, 2018), and the level of learners. Thus, learners at different levels might display different actions and thoughts according their proficiency level (Szyszka, 2023). While acknowledging these limitations, the author hopes that the study's results, demonstrating that several ID factors work in tandem to achieve L2 comprehensibility can help learners improve their pronunciation. Furthermore, it is hoped that these results will inspire future efforts to teach L2 pronunciation more effectively in the classroom.

Acknowledgements

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Appendix

Questionnaire Used in this Study, with Notes indicating the Source of Each Item

1	I imitate native speakers or my teachers' pronunciation.
2	I encourage myself by making positive statements, such as *My pronunciation is improving*.
3	I use phonetic symbols or my own code to remember how to pronounce words in English.
4	I ask someone else to correct my pronunciation.
5	I repeat pronunciation aloud after my teacher.
6	I study English because close friends of mine think it is important.
7	I associate words which I don't know how to pronounce with the words I know how to pronounce.
8	I do exercise/ practice to acquire English sounds.
9	I can imagine a situation where I am speaking English with foreigners.
10	I learn pronunciation with someone else.
11	I have to study English, because if I do not study it, my parents will be disappointed with me.
12	I take risks in pronouncing words regardless of the possibility of making mistakes.
13	I teach or help someone else with their English pronunciation.
14	Learning English is necessary because people surrounding me expect me to do so.
15	I imagine myself as someone who is able to speak English.
16	I have a clear goal in mind when I learn pronunciation.
17	I read reference materials about pronunciation rules.
18	I pay more attention to my pronunciation if my pronunciation is appreciated by others.

19	Whenever I think about my future career, I imagine myself using English.
20	I repeat aloud after tapes, television, a movie or electronic dictionaries.
21	My parents believe that I must study English to be an educated person.
22	Learning pronunciation is useful for improving my English.
23	The things I want to do in the future require me to speak English.
24	I speak slowly to get the pronunciation right.
25	I notice mouth position and watch lips.
26	While preparing for a presentation, I note down words that are difficult for me to pronounce.
27	When learning pronunciation, I look for a good environment to practice.
28	I form and use hypotheses about pronunciation rules.
29	I purposefully focus on learning particular English sounds.
30	When learning pronunciation, I persist until I reach my self-made goals.
31	I listen to tapes, television movies or music in English.
32	Learning pronunciation is important for me.
33	I choose to memorise, rather than read, a presentation.