

Determinants of Strategic Self-Regulation: A Study of Mandarin and Arabic Learners

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ABSTRACT

Utilisation of metacognitive strategies and self-regulation are essential elements of effective foreign language acquisition, especially for languages deemed "challenging" or "remotely related" to a learner's native language. This research examined the factors influencing strategic self-regulation in university students studying Mandarin and Arabic. Utilizing a quantitative survey design, data were collected from 137 language learners regarding their use of nine key metacognitive strategies, including planning, monitoring, and seeking social opportunities for language use. The research examined three primary potential determinants: language type (Mandarin vs. Arabic), gender, and prior learning experience. The instrument demonstrated high internal consistency (Cronbach's $\alpha = .916$). Results from Independent Samples T-tests revealed that language type was a significant determinant of strategic self-regulation, $t(135) = 2.465$, $p = .015$, with Mandarin learners reporting significantly higher strategy usage ($M = 4.01$, $SD = 0.54$) compared to Arabic learners ($M = 3.72$, $SD = 0.72$). In contrast, gender and past experience were not identified as statistically significant factors of strategy adoption. The findings indicate that the cognitive and structural requirements of the target language may significantly influence a learner's metacognitive framework more than individual demographic factors. The study concludes with pedagogical implications for language instructors, highlighting the need for targeted metacognitive training that accounts for the unique challenges of specific foreign languages.

Keywords: Metacognitive strategies, Self-regulation, Mandarin learning, Arabic learning, Language learner background, Foreign language pedagogy.

INTRODUCTION

The international language education arena has seen a substantial increase in the learning of non-alphabetic and morphosyllabic languages. Mandarin and Arabic are considered to be very important languages for international communication, business and diplomacy. Both languages are rated "Category IV" by the Foreign Service Institute (FSI), meaning they are among the most difficult languages to learn for native English speakers and many others. The successful mastery of the two complex systems with their character-based writing and root-based morphology largely depends on the learner's ability to move beyond passive absorption and engage in proactive self-regulation (Mercer, 2019; Oxford, 2017; Zimmerman, 2000).

Strategic self-regulation refers to the intentional and aware methods that learners employ to organise, oversee, and assess their language acquisition journey. This encompasses a range of metacognitive techniques such as designating a particular study duration, seeking native speakers for practice, and setting explicit objectives for linguistic development (Macaro, 2006; O'Malley & Chamot, 1990; Teng, 2022) in the context of foreign language learning. Despite the vast discourse in the literature regarding the advantages of these methods, there remains a lack of agreement on the "determinants" that influence a student's utilisation of them. The impetus for becoming a strategic learner is frequently examined through the lens of personal demographic factors, including gender and previous educational background (Green & Oxford, 1995; Pintrich, 2000), or through the particular structural requirements of the target language (Sweller et al., 2019).

Despite the growing body of research on metacognition, few studies have conducted a comparative analysis between learners of Mandarin and Arabic—two languages that, while both difficult, present entirely different cognitive challenges. Mandarin requires significant visual-spatial memory for character recognition, while Arabic demands a high level of phonological and morphological analysis. Understanding how learners of these two languages differ in their self-regulatory habits can provide vital insights into how teachers can better support students in high-difficulty language classrooms (Hiver et al., 2021; Teng & Zhang, 2020).

This study aims to fill this gap by investigating the factors that influence metacognitive strategy use among university students. By examining a sample of 137 learners, the research seeks to identify the primary determinants of strategic self-regulation. Specifically, the study analyzes the impact of:

- **Language Type:** Does the specific nature of Mandarin versus Arabic influence the frequency of strategy use?
- **Gender:** Do male and female students exhibit different levels of self-regulatory engagement?
- **Prior Experience:** Does a background in the language (from primary school or tuition centers) lead to more sophisticated metacognitive habits in later stages of learning?

By identifying these determinants, this research contributes to the development of more effective pedagogical frameworks that encourage students to become autonomous and strategically minded learners, regardless of the linguistic hurdles they face.

Problem Statement

Mandarin and Arabic are recognized globally as highly challenging languages for second language learners, often requiring significant cognitive effort and a high degree of learner autonomy (Kim et al., 2015; Abu-Rabia, 2019; Teng, 2022). To navigate the complexities of these languages—ranging from Mandarin's logographic script to Arabic's complex morphological roots—students must move beyond rote memorization and employ strategic self-regulation (Teng & Zhang, 2020). Metacognitive strategies, such as planning study time, monitoring progress, and seeking out social practice, have been identified as essential for survival in high-difficulty language courses (Rose et al., 2021; Teng, 2022).

However, a significant gap exists in understanding the "determinants" that influence why some students engage in these strategic behaviors while others do not. There is ongoing debate in educational psychology regarding whether strategy use is primarily driven by individual learner traits, such as gender and prior experience, or by the specific linguistic challenges posed by the target language itself (Sweller et al., 2019). While previous research has looked at these factors in isolation, there is a lack of comparative data between Mandarin and Arabic learners—two groups facing distinct linguistic hurdles (Hiver et al., 2021). Without identifying these primary determinants, educators cannot effectively tailor their instructional methods to support student autonomy. This study addresses this gap by investigating the extent to which language type, gender, and prior experience serve as predictors of strategic self-regulation in a university setting.

Research questions

To address the problem described above, this study seeks to answer the following research questions:

- What is the overall level of strategic self-regulation reported by university students learning Mandarin and Arabic?
- To what extent does the type of foreign language (Mandarin vs. Arabic) influence the frequency of metacognitive strategy use?
- Is there a significant difference in strategic self-regulation between male and female students in the context of these specific languages?
- Does prior learning experience (e.g., primary school or private tuition) significantly impact the current self-regulatory habits of university language learners?

Which factor (Language, Gender, or Prior Experience) serves as the strongest determinant of a student's engagement in strategic self-regulation?

LITERATURE REVIEW

The Role of Strategic Self-Regulation in Second Language Acquisition (SLA)

Self-regulated learning (SRL) has become a fundamental paradigm in educational psychology, characterising the extent to which individuals engage metacognitively, motivationally, and behaviourally in their learning journey (Mercer, 2019; Teng & Zhang, 2020). In the realm of Second Language Acquisition (SLA), researchers redefine this paradigm as "strategic self-regulation," highlighting that adept language learners actively engage with information rather than passively receiving it (Oxford, 2017; Teng, 2022). Conversely, they intentionally utilise metacognitive techniques—like systematic scheduling, concentrated focus, targeted goal establishment, and intentional error oversight—to manage the cognitive demands of acquiring a new language system (Rose et al., 2021).

Extensive contemporary literature confirms that learners who exhibit higher levels of strategic self-regulation achieve superior fluency, higher retention rates, and stronger communicative competence (Hiver et al., 2021). However, while the positive relationship between strategy use and language achievement is widely documented, scholars continue to debate the primary "determinants" that influence why certain students spontaneously adopt these self-regulatory habits while others remain passive (Rose et al., 2021; Teng, 2022).

The Influence of Target Language Typology and Cognitive Load

One emerging perspective suggests that the structural and typographic characteristics of the target language itself act as a powerful determinant of student strategy adoption. According to Cognitive Load Theory, learning tasks that possess a high intrinsic cognitive load require a greater expenditure of working memory, forcing learners to develop secondary coping strategies (Sweller et al., 2019).

When applied to SLA, languages categorized by the Foreign Service Institute (FSI) as exceptionally difficult for native English speakers—such as Mandarin Chinese and Arabic—impose massive but distinct cognitive demands. Mandarin is a morphosyllabic language operating on a logographic character script. It requires high visual-spatial memory for character recognition, stroke ordering, and radical identification, combined with tone management (Kim et al., 2015). Conversely, Arabic is an alphabetic system in which short vowel diacritics, while central to accurate word recognition, are frequently omitted from everyday texts — a feature whose contribution to reading remains contested in the literature (Abu-Rabia, 2019).

While both tracks represent peak linguistic difficulty, recent literature indicates that character-based systems (like Mandarin) impose substantial working memory demands, given the need to retain thousands of independent visual symbols (Kim et al., 2015). Empirical comparative research directly tracking metacognitive strategy variance specifically between Mandarin and Arabic classrooms remains sparse, creating a critical gap in understanding how target language features alter self-regulatory behavior (Hiver et al., 2021).

Gender as a Factor in Language Learning Strategy Use

For decades, researchers have investigated gender as a primary demographic predictor of language learning strategy adoption. While early SLA literature pointed to a clear "gender advantage" favoring female students in strategy frequency, contemporary research shows a much more nuanced pattern (Rahimi et al., 2008).

Sociolinguistic and psychological theories traditionally attributed gender differences to socialization patterns, stating that females often show a higher inclination toward social communication strategies (e.g., looking for interaction partners) and meticulous organizational habits (e.g., planning study routines). However, contemporary empirical research demonstrates that this gap disappears entirely in some higher education settings, such as among post-secondary Persian EFL learners, where gender showed no significant effect on strategy use (Rahimi et al., 2008; Rose et al., 2021). In advanced foreign language classes, the intricate nature of the linguistic content may surpass fundamental gender-related tendencies, making gender a less significant element in forecasting strategic self-regulation.

The Impact of Prior Language Learning Experience

Another essential determinant explored in self-regulated learning frameworks is the role of prior domain knowledge and historical learning experience. A learner's past educational background directly forms their metacognitive knowledge base (Pintrich, 2000; Teng, 2022). Students who have previously encountered a language—whether through childhood schooling, private tuition centers, or preparatory courses—enter the classroom with an established schema of how that language functions (Hiver et al., 2021).

In theory, these experienced learners possess a more mature metacognitive toolkit, allowing them to accurately monitor their progress, identify mistakes quicker, and manage their study schedules better than complete beginners (Teng & Zhang, 2020). However, recent empirical studies counter this notion, showing that prior experience does not automatically translate into active university-level self-regulation, especially if early instruction was heavily teacher-centered or based on passive rote memorization (Rahimi et al., 2008). Thus, investigating whether prior background continues to predict superior strategy use concurrently with current classroom variables is essential to forming accurate pedagogical frameworks (Hiver et al., 2021).

METHODOLOGY

The target population for this study consisted of university-level students enrolled in foreign language courses. A convenience sampling technique was utilized to recruit 137 participants who were actively studying either Mandarin Chinese or Arabic (Creswell & Creswell, 2018). The 9-item Self-Regulation scale used in this study was adapted from established second-language strategy inventories, drawing on item content validated in prior self-regulated learning research (O'Malley & Chamot, 1990; Zimmerman, 2000). Items were reviewed by two applied linguistics faculty members for content validity and clarity prior to distribution, and minor wording adjustments were made based on their feedback. Sample items included statements such as "I try to find out how to be a better learner of Mandarin/ Arabic" and "I plan my schedule so I will have enough time to study Mandarin/ Arabic." No formal pilot test was conducted prior to the main study; the internal consistency reported here ($\alpha = .916$) was calculated on the full sample. Participants responded to each of the 9 items using a 5-point Likert scale, where 1 represented "Strongly Disagree" and 5 represented "Strongly Agree". A composite "Self-Regulation Score" was calculated for each participant by averaging their responses across all 9 items, yielding a continuous score between 1.0 and 5.0 (Pallant, 2020).

Multiple linear regression was deployed as the primary modeling tool (Field, 2024). The composite Self-Regulation Score was entered as the continuous dependent variable, while Language Type, Gender, and Prior Experience were entered concurrently as predictors. This model allowed the researchers to isolate the unique variance contributed by each background factor and mathematically establish the strongest determinant of strategic self-regulation. The statistical significance threshold for all inferential tests was set at $p < .05$ (Cohen, 1988).

RESULTS AND DISCUSSION

Before conducting the primary analyses, a reliability check was executed to verify the internal consistency of the 9-item scale measuring strategic self-regulation. The Case Processing Summary confirmed that all $N = 137$ cases (100.0%) were valid, with zero exclusions. The scale achieved a Cronbach's Alpha (α) coefficient of .916, indicating an excellent level of internal consistency and confirming that the items reliably measure a single underlying construct. Consequently, a composite "Self-Regulation Score" was safely computed for each participant using the mean score across all nine items.

Table 1 Case Processing Summary

		N	%
Cases	Valid	137	100.0

	Excluded	0	.0
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Listwise deletion based on all variables in the procedure.

Table 2 Reliability Statistics

Cronbach's Alpha	N of Items
.916	9

The overall baseline level of metacognitive strategy use among the participants was high, yielding a total average mean score of ($M = 3.83$, $SD = 0.67$) on a 5-point Likert scale. Looking at the categorical subsets, Mandarin learners exhibited a higher average strategy mean ($M = 4.01$, $SD = 0.54$) than Arabic learners ($M = 3.72$, $SD = 0.72$). Female students reported a higher mean ($M = 3.87$, $SD = 0.66$) than male students ($M = 3.63$, $SD = 0.72$). Lastly, individuals with prior experience reported slightly greater strategy usage ($M = 3.85$, $SD = 0.65$) than absolute beginners ($M = 3.79$, $SD = 0.72$).

Table 3 Descriptive Statistics

Variable	Category	N	Mean Score (1-5)	Std. Deviation
Language	Mandarin	51	4.01	0.54
	Arabic	86	3.72	0.72
Gender	Male	24	3.63	0.72
	Female	113	3.87	0.66
Prior Exp.	No	46	3.79	0.72
	Yes	91	3.85	0.65

A series of Independent Samples T-tests were conducted to isolate standalone mean differences across the three key background dimensions. For all three tests, Levene's Test for Equality of Variances yielded significance values well above the $\alpha = .05$ threshold (Language: $p = .257$; Gender: $p = .297$; Prior Experience: $p = .608$), meaning the assumption of equal variances was met across all comparisons.

The T-test revealed a statistically significant difference between language tracks, $t(135) = 2.465$, $p = .015$. Mandarin learners used self-regulatory strategies significantly more ($M = 4.01$, $SD = 0.54$) than their peers studying Arabic ($M = 3.72$, $SD = 0.72$), carrying a mean difference of 0.287. The differences between male and female students ($p = .107$) as well as students with or without prior learning experience ($p = .616$) were not statistically significant.

Table 4 T-Test 1: Comparison by Language (Mandarin vs. Arabic)

Group Statistics

Variable	Language	N	Mean	Std. Deviation	Std. Error Mean
Self-Regulation Score	Mandarin	51	4.01	0.54	0.075
	Arabic	86	3.72	0.72	0.078

Independent Samples Test

	Levene's Test (Sig.)	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.257	2.465	135	.015	0.287

Table 5 T-Test 2: Comparison by Gender (Male vs. Female)

Group Statistics

Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean
Self-Regulation Score	Male	24	3.63	0.72	0.147
	Female	113	3.87	0.66	0.062

Independent Samples Test

	Levene's Test (Sig.)	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.297	-1.622	135	.107	-0.244

Table 6 T-Test 3: Comparison by Prior Experience (Yes vs. No)

Group Statistics

Variable	Prior Experience	N	Mean	Std. Deviation	Std. Error Mean
Self-Regulation Score	No	46	3.79	0.72	0.106
	Yes	91	3.85	0.65	0.068

Independent Samples Test

	Levene's Test (Sig.)	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.608	-0.502	135	.616	-0.061

To discover which background variable serves as the dominant driver when evaluated simultaneously, a Multiple Linear Regression analysis was conducted. The model entered Language Type, Gender, and Prior Experience concurrently as predictors against the continuous composite Self-Regulation Score.

The overall model was statistically significant, $F(3,133) = 3.675$, $p = .014$, indicating that the combination of these predictors reliably models strategy levels. The model yielded an R-squared value of 0.077, meaning these three background factors explain approximately 7.7% of the total variance in strategic self-regulation. This relatively modest proportion of explained variance suggests that language, gender, and prior experience alone are insufficient to account for strategic self-regulation, and that other learner-internal and contextual factors -such as motivation, self-efficacy, language anxiety, and classroom or learning environment characteristics- likely contribute meaningfully to strategy use and should be incorporated in future predictive models (Teng & Zhang, 2020).

When examining the specific contribution of individual predictors, Language Type emerged as the sole statistically significant determinant ($B = -0.348$, $t = -2.782$, $p = .006$). Conversely, neither Gender ($B = 0.226$, $t = 1.522$, $p = .130$) nor Prior Learning Experience ($B = 0.219$, $t = 1.709$, $p = .090$) made a significant unique contribution to the model.

Table 7 Coefficients Table

Model Predictor	Unstandardized B	Std. Error	t-value	Sig. (p)	Significance
(Constant)	3.717	0.173	21.534	< .001	***
Language (Arabic vs. Mandarin)	-0.348	0.125	-2.782	.006	Significant
Gender (Female vs. Male)	0.226	0.148	1.522	.130	Not Sig.
Prior Exp. (Yes vs. No)	0.219	0.128	1.709	.090	Not Sig.

Table 8 Effect Sizes for Group Comparisons

Comparison	Mean diff.	Pooled SD	Cohen's d	Interpretation
Language (Mandarin vs. Arabic)	0.287	0.659	0.44	Small-to-medium
Gender (Female vs. Male)	0.244	0.671	0.36	Small-to-medium
Prior Experience (Yes vs. No)	0.061	0.674	0.09	Negligible

Table 9 Effect Sizes for Regression Predictors

Regression predictor	t	Partial η^2	Interpretation
Language	-2.782	.055	Small-to-medium
Gender	1.522	.017	Small
Prior Experience	1.709	.021	Small

The primary objective of this study was to evaluate the major determinants of strategic self-regulation among university-level language students. The statistical evidence indicates that the specific language target (Mandarin vs. Arabic) is a meaningful factor shaping metacognitive strategy habits, with a small-to-medium effect size, whereas individual learner profiles — specifically gender and prior historical background — did not emerge as significant unique predictors when analyzed collectively, though the gender effect was comparable in size and may warrant further investigation with a more balanced sample.

The prominent finding that Mandarin learners engage in significantly higher levels of strategic self-regulation than Arabic learners presents important theoretical implications. This difference, while statistically significant, $t(135) = 2.465$, $p = .015$, corresponded to a small-to-medium effect size ($d = 0.44$), suggesting a meaningful but modest association between target language and strategy use rather than a dominant one. Although both Mandarin and Arabic are objectively categorized as challenging, high-difficulty languages, they place contrasting cognitive loads on the learner (Sweller et al., 2019). Mandarin utilizes a morphosyllabic, logographic character system that entirely lacks phonetic letter-to-sound correspondences. Mastering Mandarin plausibly demands substantial working memory resources for character recognition and retention (Kim et al., 2015), which may explain the elevated strategy use observed among Mandarin learners in this sample.

In contrast, while Arabic operates on a phonetic alphabetic framework, or abjad script, in which short vowels are often omitted from everyday texts, a feature shown to have inconsistent effects on reading fluency across studies (Abu-Rabia, 2019). This may allow a certain level of reading fluidity via phonetic decoding, which could plausibly demand less rigorous conscious strategy tracking compared to character memorization — though this interpretation remains speculative given the modest effect size and the correlational nature of the design.

This pattern aligns with recent comparative work suggesting that script complexity and orthographic depth shape strategic behavior differently across learner populations. For instance, studies of Chinese-as-a-second-language learners consistently report higher use of rehearsal and elaboration strategies compared to learners of alphabetic languages, attributed to the demands of non-alphabetic character retention (Kim et al., 2015). Taken together, these findings suggest that strategy instruction may benefit from being tailored to the specific orthographic and morphological demands of the target language, rather than applying a uniform strategy-training approach across all language learners.

The gender comparison did not reach statistical significance, $t(135) = -1.622$, $p = .107$, though the observed effect size ($d = 0.36$) was similar in magnitude to the language effect. Given the pronounced gender imbalance in this sample (24 male vs. 113 female participants), this result should be interpreted with caution: the male subsample may have been underpowered to detect a real difference, rather than gender being conclusively unrelated to strategy use. Future research with a more balanced gender distribution is needed before ruling out a gender effect.

Prior learning experience, by contrast, showed a genuinely negligible effect ($d = 0.09$, partial $\eta^2 = .021$), indicating that whether students had studied the language before entering university made little practical difference to their current self-regulatory habits. This is a more robust null finding than the gender result and supports the interpretation that strategic self-regulation is not simply inherited from earlier exposure but is shaped more immediately by the structural demands of the current language being studied (Hiver et al., 2021; Teng, 2022).

CONCLUSION

Pedagogical Implications

For language educators, these results underscore that self-regulatory skills are a responsive adaptation to syllabus and structural difficulty rather than fixed, unchangeable learner traits. Because Arabic learners demonstrated significantly lower rates of spontaneous self-regulation compared to Mandarin learners, instructors in Arabic programs should deliberately weave explicit metacognitive strategy instruction into their weekly curricula. For example, teachers can explicitly model how to schedule root-word extraction practice, establish structured vocabulary tracking benchmarks, or run self-monitoring checks during reading exercises. Ultimately, by recognizing that target language architecture serves as a core determinant of student strategy use, educational institutions can move away from generic, one-size-fits-all language frameworks and develop custom, language-specific interventions that actively foster learner autonomy.

LIMITATIONS AND FUTURE RESEARCH

While this study offers valuable insights into the primary determinants of strategic self-regulation among Mandarin and Arabic learners, several limitations should be acknowledged when interpreting the findings.

First, the multiple linear regression model accounted for 7.7% of the total variance ($R^2 = .077$) in students' strategic self-regulation. While this relationship was statistically significant ($F = 3.675$, $p = .014$) and typical for empirical behavioral research, it indicates that a substantial proportion of variance (92.3%) remains explained by unmeasured factors. Future studies should expand the predictive model by incorporating additional psychological and contextual variables, such as student motivation, task value, language anxiety, teaching style, and weekly hours of self-directed study.

Second, the study utilized a convenience sample of $N = 137$ university students, which introduces demographic imbalances. Specifically, the sample was predominantly female (82.5%) and leaned more heavily toward Arabic learners (62.8%) than Mandarin learners (37.2%). While statistical assumptions (such as equality of variances) were met, these subgroup discrepancies may limit the generalizability of the findings across wider demographic contexts. Future research should employ stratified random sampling across multiple institutions to achieve a more balanced distribution across gender and language tracks.

The reliance on convenience sampling from a single institutional context, combined with the pronounced gender imbalance in the sample (113 females vs. 24 males), limits the generalizability of these findings to broader, more demographically balanced populations of language learners. Future studies should recruit across multiple institutions with quota or stratified sampling to achieve more balanced gender representation.

Finally, the cross-sectional nature of the research design captured student self-regulation at a single point in time via self-reported survey items. Longitudinal designs that track students across sequential academic semesters—complemented by qualitative measures like think-aloud protocols or study logs—would provide a richer understanding of how metacognitive strategies adapt dynamically as language difficulty increases.

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