

Rethinking Metacognition in L2 Reading: From Self-Reported Strategy Use to Multimethod Measurement

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ABSTRACT

Metacognition has received considerable attention in L2 reading research over the past decades. Much of this research has focused on learners' awareness and reported use of reading strategies, as these processes are central to understanding how readers approach, monitor, and evaluate comprehension. Established self-report instruments such as the Metacognitive Awareness of Reading Strategies Inventory (MARSİ) and the Survey of Reading Strategies (SORS) provide valuable insights into learners' perceived strategy use across global, problem-solving, and support strategies. However, perceived strategy use may not always correspond to strategies enacted during a particular reading task. This conceptual paper therefore examines the limitations of relying primarily on self-report measures and proposes a stage-based multimethod decision framework that combines self-report, verbal, and real-time behavioural evidence before, during, and after L2 reading. The framework specifies the contribution of each evidence source and shows how convergence and divergence across measures can support research interpretation and classroom-based diagnostic assessment. This approach offers a more comprehensive account of metacognition without treating any single measure as a direct representation of strategic behaviour.

Keyword: Metacognition, Reading Strategies, L2 Reading, Multimethod Measurement, Diagnostic Assessment

INTRODUCTION

Reading requires an active construction of meaning as readers interact with the text. Several underlying elements contribute to the multidimensional nature of reading, including readers' prior knowledge, cognitive resources, linguistic repertoire, and purpose for reading. Since comprehension does not necessarily occur automatically, L2 reading places additional demands on readers as they negotiate difficulties arising from the language and the text (Grabe & Stoller, 2002; Zhang & Seepho, 2013). In navigating these demands, L2 readers draw on knowledge at multiple linguistic levels, including vocabulary, grammar, syntax, and semantics. However, Eskey (2005) cautioned that linguistic knowledge alone may not fully explain how readers respond when comprehension becomes difficult. Snow (2002) further highlighted that readers must identify difficulties that impede their comprehension, make decisions about how to proceed, and adjust their reading accordingly.

Hence, such processes highlight the importance of understanding not only what knowledge readers bring to a reading task, but also how they regulate their comprehension while reading. This corresponds with the role of metacognition, which has been broadly associated with knowledge and regulation of cognitive processes (Flavell, 1979). His foundational conceptualisation of metacognition has since generated considerable interest in the study of metacognitive processes and strategic behaviour in reading. Such interest has also contributed to the development of self-report instruments, including the Metacognitive Awareness of Reading Strategies Inventory (MARSİ) by Mokhtari and Reichard (2002), which examines readers' awareness and perceived use of reading strategies.

Self-report instruments have since been widely used to provide valuable insights into readers' metacognitive awareness and perceived strategy use. Nevertheless, such evidence represents only one perspective on the

dynamic nature of metacognition, as what readers report may not necessarily correspond with the strategies they enact during an actual reading task. This distinction raises an important methodological question concerning the extent to which reliance on self-report measures alone can adequately capture metacognitive processes in L2 reading. Therefore, this conceptual paper examines the limitations of relying primarily on self-report measures and proposes a multimethod perspective in which self-reported strategy awareness is complemented by verbal and behavioural evidence of strategic reading processes. Accordingly, this paper proposes a stage-based decision framework that clarifies how self-report, verbal, and behavioural evidence may be integrated before, during, and after an L2 reading task.

LITERATURE REVIEW

Metacognition and Strategic Reading in L2 Contexts

Flavell's (1979) conceptualisation of metacognition has become fundamental to understanding how learners manage their cognitive processes, particularly in relation to their knowledge and monitoring of those processes. Flavell distinguished metacognitive knowledge from metacognitive experiences and emphasised the role of cognitive monitoring in the regulation of intellectual activities (Flavell, 1979). Subsequent work by Brown (1987) further distinguished between knowledge of cognition and the regulation of cognition. In learning and reading research, regulatory processes are commonly associated with activities such as planning, monitoring, and evaluating, which enable learners to assess their progress and make decisions about how to respond when difficulties occur (Brown, 1987; O'Malley & Chamot, 1990). Metacognition therefore extends beyond readers' knowledge of strategies to include their capacity to regulate cognitive activity according to the demands of a reading task.

In L2 reading, metacognitive processes operate alongside the linguistic and cognitive resources involved in achieving comprehension. Possessing linguistic knowledge, such as vocabulary and grammatical knowledge, may not in itself explain how readers manage these resources in response to different texts and reading purposes. Supporting this multidimensional view, Vettori et al. (2024), in their systematic review of L2 English reading comprehension, identified positive associations involving language skills, cognitive abilities, and higher-order factors, including metacognitive knowledge. These findings suggest that metacognition can be viewed as one component within the broader interaction of processes associated with L2 reading comprehension rather than as an isolated determinant of successful reading (Vettori et al., 2024).

The regulatory role of metacognition becomes particularly relevant in strategic reading, whereby readers employ strategies in response to the demands or difficulties encountered during reading (Pressley & Afflerbach, 1995; Grabe, 2009). Such strategies may include rereading difficult sections, predicting, making contextual inferences, or adjusting reading speed. However, the availability or use of these strategies alone does not necessarily explain how readers determine when and how a particular strategy should be employed. Metacognitive regulation is therefore important in enabling readers to monitor their comprehension and regulate their strategic responses according to the difficulties encountered during the reading process (O'Malley & Chamot, 1990; Phakiti, 2006).

Consequently, strategic reading should not be understood solely in terms of the number or types of strategies available to readers. Of equal importance are readers' awareness of these strategies and their capacity to regulate their use according to the demands of the reading task. Growing interest in readers' metacognitive awareness and strategic behaviour has therefore generated a need for systematic approaches to identifying and measuring such processes. One influential response to this need was the development of self-report inventories of metacognitive reading strategy awareness and perceived use, including the Metacognitive Awareness of Reading Strategies Inventory (MARSİ) developed by Mokhtari and Reichard (2002).

Measuring Metacognitive Reading Strategies: From Perceived to Enacted Strategy Use

The growing interest in metacognitive awareness in reading has contributed to the development of self-report instruments that enable researchers to systematically examine readers' perceived strategy use. Among the most established is the Metacognitive Awareness of Reading Strategies Inventory (MARSİ), developed by Mokhtari

and Reichard (2002) to assess readers' awareness and perceived use of strategies when reading academic or school-related materials. MARSIS categorises reading strategies into three dimensions, namely global, problem-solving, and support strategies. Drawing on a similar measurement approach, Mokhtari and Sheorey (2002) developed the Survey of Reading Strategies (SORS) for adolescent and adult ESL readers. The continued application of these instruments has also led to efforts to refine their measurement properties. For instance, Mokhtari et al. (2018) revised the original 30-item MARSIS into the 15-item MARSIS-R following further examination of its structural validity and factorial invariance. More recently, Alamer and Alsagoafi (2023) revisited the construct validity of MARSIS-R among L2 learners, further demonstrating that the measurement of metacognitive reading strategies remains an evolving area of methodological inquiry.

Despite their contributions, the nature of self-report instruments warrants consideration when interpreting readers' strategy use. Instruments such as MARSIS, SORS, and MARSIS-R primarily provide evidence concerning readers' awareness and perceptions of their strategic behaviour rather than direct observations of strategies enacted during a particular reading task. This distinction is particularly important because readers' perceptions of their general strategy use may not necessarily correspond with their strategic responses to specific comprehension demands. He et al. (2023), for instance, found changes in EFL learners' self-perceived metacognitive awareness after completing a reading task, suggesting that learners' perceptions of their strategy use may not always reflect their actual use. Thus, while self-report measures remain valuable for identifying readers' perceived strategic tendencies, caution is required when such reports are interpreted as direct representations of metacognitive processes occurring during reading.

The distinction between perceived and enacted strategy use has prompted researchers to complement self-report measures with process-oriented methods. Think-aloud protocols, for example, provide a different source of evidence by requiring readers to verbalise aspects of their thinking while engaging in a reading task. Lee and Oxford (2007) combined questionnaires and think-aloud protocols to examine the extent to which the two approaches provided complementary or contradictory accounts of L2 learners' reading strategy use. Similarly, Kim and Choi (2018) employed questionnaires, think-aloud tasks, and retrospective interviews to compare Korean university students' metacognitive awareness with their enactment of L2 reading strategies. More recent research has continued to examine the relationship between perceived and actual strategy use across reading tasks (Nilforoushan et al., 2023). Collectively, these studies demonstrate that strategic reading may be examined through multiple sources of evidence rather than relying exclusively on readers' retrospective perceptions.

Nevertheless, the use of multiple methods should not imply that self-report measures are inherently less valid than process-oriented approaches. Different methods may instead provide evidence concerning different aspects of metacognition. While questionnaires can reveal readers' awareness and perceptions of their strategic tendencies, think-aloud protocols and retrospective interviews may provide evidence concerning strategies associated with a particular reading episode. Behavioural and process-based measures may further complement these sources by capturing observable aspects of reading activity. Accordingly, convergence or divergence across different measures may itself provide meaningful evidence concerning the relationship between perceived metacognitive awareness and enacted strategic behaviour. This distinction provides an important foundation for reconsidering how metacognition in L2 reading may be conceptualised and measured through a multimethod perspective.

DISCUSSION

Rethinking What Self-Report Measures

Self-report inventories are valuable because they provide systematic evidence of readers' awareness, beliefs, and perceived strategic tendencies across texts. However, their scores should not be interpreted as direct records of the cognitive and regulatory processes occurring during a specific reading episode. Craig et al. (2020) demonstrated that metacognitive self-report subscales do not always show clear relationships with process-based measures. Double (2025) also reported divergence between perceived monitoring ability and online measures of monitoring. These discrepancies do not invalidate self-report evidence; instead, they suggest that perceived awareness and task-specific behaviour reflect different, though related, aspects of metacognition. The revision

of MARSI into MARSI-R improved the instrument's measurement properties (Mokhtari et al., 2018), but it did not convert a perception-based inventory into a direct measure of enacted regulation.

A multimethod design is most effective when each method serves a complementary function rather than being treated as an interchangeable indicator. Questionnaires can establish learners' general perceptions, while think-aloud protocols and retrospective interviews can reveal how learners explain decisions related to specific reading tasks. Real-time behavioural measures can record instances of attention, rereading, hesitation, or error detection. Divergence among these sources is methodologically meaningful. For instance, a learner may report frequent monitoring but show limited detection of comprehension breakdowns during a task. Conversely, a learner may demonstrate adaptive rereading patterns without describing monitoring as a habitual strategy. These patterns highlight the importance of not reducing metacognition to either questionnaire frequency or isolated behavioural events (Araujo et al., 2025; He et al., 2023).

A Stage-Based Multimethod Decision Framework

To operationalise this complementary relationship, the proposed framework organises evidence collection into four stages: orientation before reading, regulation during reading, reflection after reading, and cross-method integration. Table 1 outlines the diagnostic purpose and contribution of each method at each stage. The framework does not require the use of every available technique in every study. Instead, researchers and teachers may select the least intrusive combination that can answer the diagnostic question, taking into account participants, task demands, technical resources, and the potential reactivity of verbalisation.

Table 1 Stage-Based Decision Matrix for Multimethod Assessment of Metacognition in L2 Reading

Reading stage and purpose	Self-report evidence	Verbal evidence	Real-time behavioural evidence	Integrative decision
Before reading <i>Orientation:</i> Identify awareness and intended approach	MARSI, SORS, or MARSI-R profiles perceived tendencies across texts.	Goal prompts or brief pre-task interviews elicit planned approaches and perceived difficulty.	Baseline reading behaviour or calibration establishes comparison conditions where relevant.	Compare general awareness with task-specific intentions; select processes requiring closer observation.
During reading <i>Regulation:</i> Identify enacted planning, monitoring, and repair	Self-report is not used as the sole evidence of moment-to-moment regulation.	Concurrent think-alouds reveal stated comprehension checks, inferences, and repair decisions.	Eye movements, self-paced reading times, trace logs, rereading, and error-detection responses locate observable events.	Link verbalised decisions to timed behaviour; note convergent, complementary, or discrepant evidence.
After reading <i>Reflection:</i> Explain decisions and relate them to outcomes	Task-specific ratings capture perceived strategy use, confidence, and difficulty after the task.	Retrospective or stimulated-recall interviews clarify decisions at selected points without continuous interruption.	Comprehension scores, detected inconsistencies, and task logs provide outcome and process indicators.	Determine whether perceived regulation corresponds to observed behaviour and comprehension outcomes.
Across stages integration: Construct a diagnostic account	Provides the learner's perceived strategic profile.	Provides explanations and contextual meaning for strategic decisions.	Provides temporal and observable indicators of reading activity.	Identify instructional needs; avoid declaring one method the definitive measure of metacognition.

The framework supports the general resources collectively. Studies combining questionnaires and think-aloud data have shown that perceived and enacted strategies may converge in some areas and diverge in others (Kim & Choi, 2018; Lee & Oxford, 2007; Nilforoushan et al., 2023). The decision matrix makes these comparisons explicit: agreement can strengthen interpretations, complementary findings can clarify how a strategy is enacted, and disagreement can reveal miscalibrated awareness, task effects, or limitations about a particular measure.

Implications for Diagnostic Reading Assessment and Future Directions

In ESL classrooms, the framework can support diagnostic assessment without a fully equipped laboratory. Teachers may begin with a brief MARSIR profile to identify students who report limited monitoring or problem-solving awareness. A short reading passage can be paired with selective think-aloud prompts, annotations, or digital trace logs that record rereading and revisions to responses. After the task, comprehension questions and a brief stimulated-recall discussion can examine students' reasoning for their chosen approaches. This resulting profile distinguishes what students believe they generally do, what they can explain, what they demonstrate during the task, and whether their responses support comprehension.

This distinction can direct targeted instruction. For example, a learner who reports high monitoring but fails to detect contradictions may necessitate explicit practice in comprehension checking and error detection. A learner who notices difficulty but cannot select a repair strategy may benefit from modelling and guided practice in rereading, contextual inference, or adjusting reading speed. A learner whose behavioural evidence indicates effective regulation despite low self-ratings may need support in recognising and articulating existing strategic strengths. Use multimethod evidence to guide feedback and instruction, rather than to assign fixed labels to readers.

Multimethod assessment also introduces practical and interpretive constraints. Think-aloud procedures may alter the reading process, retrospective reports may be affected by memory, and eye-tracking or self-paced reading measures require technical expertise and careful operational definitions. Behavioural events such as long fixations or rereading should not automatically be labelled as metacognitive regulation without contextual evidence concerning the reader's purpose. Future studies should therefore report how evidence is aligned across methods, how discrepancies are coded, and how task type, proficiency, and text difficulty affect interpretation. Comparative studies can also test whether streamlined classroom combinations produce diagnostic conclusions similar to more resource-intensive laboratory designs.

CONCLUSION

Self-report inventories remain an important source of evidence about metacognitive awareness in L2 reading, but they do not directly capture the strategies enacted during a specific task. The stage-based decision framework proposed in this paper clarifies how self-report, verbal, and real-time behavioural measures can contribute before, during, and after reading. Its central contribution lies not in simply increasing the number of measures, but in assigning each method a defined diagnostic function and interpreting convergence and divergence across evidence sources. Used selectively, this approach can strengthen L2 reading research and provide teachers with more informative accounts of learners' strategic strengths and needs.

REFERENCES

1. Alamer, A., & Alsagoafi, A. (2023). Construct validation of the revised Metacognitive Awareness of Reading Strategies Inventory (MARSIR) and its relation to learning effort and reading achievement. *Studies in Second Language Learning and Teaching*, 13(1), 125–149. <https://doi.org/10.14746/ssllt.31990>
2. Araujo, J., Gomes, C. M. A., & Jelihovschi, E. G. (2025). Performance-based metacognitive tests versus self-report: What does prediction tell us? *Psicologia: Reflexão e Crítica*, 38, Article 26. <https://doi.org/10.1186/s41155-025-00337-2>

3. Brown, A. L. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65–116). Lawrence Erlbaum Associates.
4. Craig, K., Hale, D., Grainger, C., & Stewart, M. E. (2020). Evaluating metacognitive self-reports: Systematic reviews of the value of self-report in metacognitive research. *Metacognition and Learning*, 15, 155–213. <https://doi.org/10.1007/s11409-020-09222-y>
5. Double, K. S. (2025). Survey measures of metacognitive monitoring are often false. *Behavior Research Methods*, 57, Article 97. <https://doi.org/10.3758/s13428-025-02621-6>
6. Eskey, D. E. (2005). Reading in a second language. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 563–580). Lawrence Erlbaum Associates.
7. Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906–911. <https://doi.org/10.1037/0003-066X.34.10.906>
8. Grabe, W. (2009). *Reading in a second language: Moving from theory to practice*. Cambridge University Press.
9. Grabe, W., & Stoller, F. L. (2002). *Teaching and researching reading*. Pearson Education.
10. He, L., Dong, M., & Wang, J. (2023). Are learners aware of their strategy use? Investigating EFL learners' self-perceived metacognitive awareness of reading strategies with the MARSIR. *English Language Teaching*, 16(7), 81–94. <https://doi.org/10.5539/elt.v16n7p81>
11. Kim, Y., & Choi, M. (2018). Reading strategy use: How exactly do second language learners' self-reports reflect their actual performance? *Linguistic Research*, 26(1), 97–117. <https://doi.org/10.24303/lakdoi.2018.26.1.97>
12. Lee, K. R., & Oxford, R. L. (2007). Triangulating think-alouds and questionnaires in reading strategy assessment: An exploratory study. *English Teaching*, 62(3), 331–356. <https://doi.org/10.15858/engtea.62.3.200709.331>
13. Mokhtari, K., Dimitrov, D. M., & Reichard, C. A. (2018). Revising the Metacognitive Awareness of Reading Strategies Inventory (MARSIR) and testing for factorial invariance. *Studies in Second Language Learning and Teaching*, 8(2), 219–246. <https://doi.org/10.14746/ssllt.2018.8.2.3>
14. Mokhtari, K., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology*, 94(2), 249–259. <https://doi.org/10.1037/0022-0663.94.2.249>
15. Mokhtari, K., & Sheorey, R. (2002). Measuring ESL students' awareness of reading strategies. *Journal of Developmental Education*, 25(3), 2–10.
16. Nilforoushan, S., Rashtchi, M., & Abbasian, G.-R. (2023). Exploring the perceived and real metacognitive reading strategies of Iranian EFL learners: Different text types in focus. *SAGE Open*, 13(1), 1–11. <https://doi.org/10.1177/21582440231164567>
17. O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Cambridge University Press.
18. Phakiti, A. (2006). Modeling cognitive and metacognitive strategies and their relationships to EFL reading test performance. *Melbourne Papers in Language Testing*, 11(1), 53–96.
19. Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Lawrence Erlbaum Associates.
20. Snow, C. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. RAND Education.
21. Vettori, G., Casado-Ledesma, L., Tesone, S., Rosi, A., & Tarchi, C. (2024). Key language, cognitive and higher-order skills for L2 reading comprehension of expository texts in English as foreign language students: A systematic review. *Reading and Writing*, 37, 2481–2519. <https://doi.org/10.1007/s11145-023-10479-3>
22. Zhang, L., & Seepho, S. (2013). Metacognitive strategy use and academic reading achievement: Insights from a Chinese context. *Electronic Journal of Foreign Language Teaching*, 10(1), 70–85.