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Development and Validation of a Self-Regulated Learning Strategies Measure in Listening among Chinese University EFL Learners

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Abstract: This study developed and validated a context-appropriate scale to assess self-regulated learning strategies for EFL listening among Chinese tertiary learners. Grounded in SRL theory and language strategy frameworks, the instrument foregrounded listening-related affect regulation and incorporated insights from prior Chinese EFL research on anxiety regulation to enhance contextual relevance. Following expert review and iterative refinement, the scale was pilot-tested with a large sample of first-year undergraduates. Using a split-sample EFA–CFA validation design, the analyses supported a stable four-factor structure, resulting in a final 23-item SRLSS comprising Social, Motivational, Affective, and Cognitive Strategies. The model showed adequate fit, and the scale demonstrated satisfactory internal consistency along with initial construct validity evidence based on internal structure and reliability indicators. Overall, the SRLSS provides an acceptable and listening-specific tool for profiling how Chinese tertiary EFL learners regulate listening comprehension and listening-related anxiety. Future research is recommended to further strengthen the validity argument through longitudinal stability, measurement invariance, and external criterion validation.

Keywords: Self-regulated learning; EFL listening; scale development; listening anxiety; Chinese tertiary learners

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1. Introduction

Self-regulated learning (SRL) is widely recognized as a key contributor to academic achievement, particularly in EFL learning, where learners must manage complex input, limited exposure, and fluctuating motivation [1,2]. Grounded in Bandura's social cognitive theory, SRL conceptualizes learning as a dynamic interaction among cognitive, behavioral, and environmental influences, positioning learners as active agents who regulate goals, strategy use, effort, and affect in response to contextual demands [3]. In classic SRL models, self-regulation is often framed as a cyclical process of planning, monitoring, and reflection that supports adaptive learning; importantly, it also entails the regulation of motivation and emotion under challenging conditions.

2. Literature review

2.1. SRL frameworks and language-specific models

SRL theory offers a clear and robust framework for strategic language learning by emphasizing regulatory processes rather than isolated techniques. Zimmerman's cyclical model has been influential in SLA because it specifies how planning, monitoring, and reflection support sustained learning over time [4]. Complementing this process model, Boekaerts and Corno (2005) emphasized that SRL involves not only cognitive control but also emotional and motivational regulation, which is particularly relevant for EFL tasks that often trigger anxiety and fluctuations in confidence [5].

In EFL contexts, Oxford's Strategic Self-Regulation (S^2R) Model links SRL theory with language learning strategies by grouping strategies into four domains, cognitive, affective, motivational, and social, each guided by meta-strategies [6]. Importantly, S^2R conceptualizes strategy use as an interactive system shaped by learners' goals, personal characteristics, and learning environments, providing a broad framework for examining SRL in language learning beyond simple frequency counts.

2.2. Measurement instruments: From general strategy inventories to SRL-oriented tools

The measurement of SRL-related strategies has evolved from broad educational and language strategy inventories to more theory-driven instruments. In educational psychology, early influential tools include the Learning and Study Strategies Inventory, which assesses strategic awareness and strategy use across skill, will, and self-regulation domains and is frequently used to diagnose learning difficulties and support low-achieving learners [7]. In language learning, Oxford's Strategy Inventory for Language Learning provides a comprehensive categorization of six strategy groups (memory, cognitive, compensation, metacognitive, affective, social). Although widely used across contexts, SILL primarily captures reported frequency of strategy use and is not explicitly grounded in SRL processes such as planning, monitoring, and reflection.

A further theoretical bridge comes from the Motivated Strategies for Learning Questionnaire, which integrates motivation and learning strategy components aligned with SRL's motivational, metacognitive, and behavioral dimensions [8]. Influenced by SRL theory, language researchers subsequently developed SRL-oriented questionnaires that integrate cognitive strategy use with motivational and environmental regulation, such as Salehi and Jafari's self-regulated language learning questionnaire and several context-specific Chinese tools [9]. Additional scales have addressed emotional regulation and anxiety coping, suggesting that anxiety levels relate to distinct self-regulatory strategy profiles [10]. In broader tertiary settings, Deng *et al.* (2022) captured multiple SRL dimensions across personal, behavioral, and environmental regulation, reflecting SRL's multifaceted nature in Chinese-speaking contexts.

A conceptual advancement was introduced by Tseng *et al.* (2006), who proposed a psychometrically grounded approach focusing on self-regulatory capacity rather than mere strategy frequency, particularly in L2 vocabulary learning [11]. Their scale operationalized internal control processes (commitment, metacognitive, satiation, emotion, and environmental control), marking a shift from cataloguing strategies to examining how learners sustain and regulate strategic behavior over time.

2.3. Skill-specific trends and the underdevelopment of listening-focused SRL measurement

SRL research has increasingly moved toward skill-specific instruments. Meta-analytic evidence indicates that writing has attracted the most SRL research attention, with studies linking SRL profiles to writing self-efficacy and performance [12–14]. Research on speaking has developed motivational regulation tools and expanded measurement to speaking-related self-efficacy [15–17]. In reading, metacognitive awareness has been associated with reading proficiency, while certain strategy patterns may show negative relations with literacy outcomes [18,19].

Compared with these domains, SRL instruments targeting listening remain less developed. Vandergrift *et al.*'s Metacognitive Awareness Listening Questionnaire is widely used and covers key metacognitive components such as

problem-solving, planning and evaluation, directed attention, and mental translation; it has been extensively adopted in listening strategy research and applied in studies [20–23]. However, MALQ primarily assesses metacognitive awareness and does not fully capture SRL's multidimensional scope (e.g., emotion regulation, motivational control, and social strategy use), which are increasingly recognized as critical for listening performance and anxiety regulation in EFL learning.

In Chinese tertiary EFL listening contexts, SRL research has expanded, yet most studies still emphasize the types and frequency of reported listening strategy use. Far fewer studies examine learners' listening-specific beliefs, such as perceived usefulness and relevance of strategies, or how strategy use shapes learners' emotions during listening (e.g., anxiety, confidence, and frustration) [24]. Behavior change perspectives suggest that such beliefs and emotional outcomes are central to sustaining long-term strategic listening behavior [25]. This gap highlights the need to refine SRL frameworks and measurement in EFL listening by foregrounding learners' perceived value and affective experiences while listening.

Guided by behavior change theories emphasizing belief-based sustainability, this study aims to develop and validate a context-appropriate instrument to measure SRL for listening among Chinese tertiary EFL learners. Grounded in SRL theory and established strategy/SRL measures, the instrument conceptualizes listening SRL as a multidimensional construct encompassing cognitive, affective, motivational, and social regulation, with meta-strategic control reflected in learners' goal setting, monitoring, and adjustment during listening tasks. To build a defensible validity argument, the study adopts a two-stage design: exploratory factor analysis is used to uncover the latent structure and refine items, followed by confirmatory factor analysis on an independent sample to verify the structure and evaluate model fit. Reliability and construct validity evidence (e.g., internal consistency, composite reliability, and structure-based indicators) are examined to support score interpretation and use.

Based on this aim, three research questions are proposed as follows:

(1) What key SRL strategy domains and items should be included in a context-appropriate SRLSS to assess Chinese tertiary EFL learners' regulation of listening performance and listening-related anxiety?

(2) What factor structure underlies the SRLSS, and does a four-factor model show adequate fit based on EFA and cross-validated CFA?

(3) Does the SRLSS demonstrate acceptable reliability and initial construct validity for assessing SRL strategies in EFL listening among Chinese tertiary learners?

3. Research methodology

3.1. Research design

The development of the questionnaire followed a structured approach informed by two well-established frameworks. First, the five-phase model proposed by Meerah *et al.* (2012), which has been adopted in recent studies such as Liang *et al.* (2022) and Ubaid (2023), served as a guiding framework [26–28]. Second, the three-phase, nine-step process for scale development and validation outlined by Boateng *et al.* (2018) was also referenced, given its extensive application in related research (e.g., Audrin *et al*., 2024; Fauville *et al*., 2021; Li *et al*., 2024; Sallam *et al*., 2023) [29–33]. Drawing on both frameworks, the questionnaire was developed through four critical phases, as illustrated in **Figure 1**.

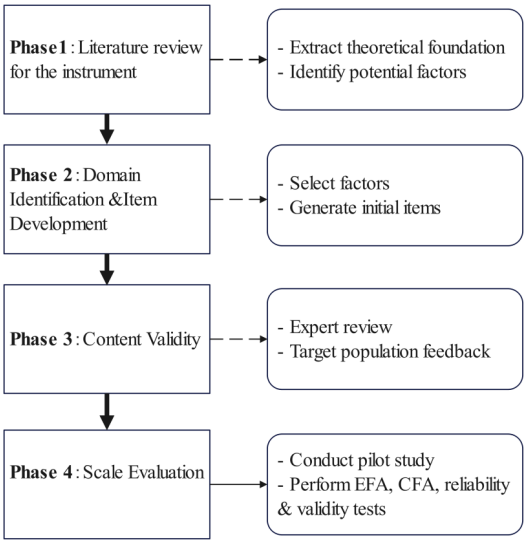

Figure 1. Questionnaire development and validation process.

3.2. Questionnaire development and validation process

3.2.1. Phase 1: Review of literature for SRL strategies

As summarized in the literature review, SRL research provides a foundation for understanding strategic learning processes. This section focuses specifically on how SRL supports anxiety regulation during EFL listening, with particular attention to Chinese tertiary contexts. Xu and Kou (2015) developed a 26-item scale assessing Chinese non-English majors' SRL strategies for managing foreign language anxiety [34]. Building on this line of work, Guo *et al.* (2018) developed 31-item instrument capturing learners' self-regulatory coping strategies for foreign language anxiety, and Wang (2023) further adapted these measures into a 22-item version suited to contemporary classroom settings [35]. Collectively, these instruments suggest that affective regulation, especially anxiety management, is a core component of SRL. Drawing on and adapting these anxiety-focused measures, the present study constructs a listening-specific and context-appropriate scale to examine how Chinese tertiary EFL learners self-regulate both listening performance and listening-related emotional challenges.

3.2.2. Phase 2: Operational definition and item development

SRL has been recognized as a critical factor in academic success, particularly in foreign language learning, where learners regulate cognitive, motivational, affective, and social processes to optimize performance [36]. Bandura (1986) conceptualized learning as a dynamic process shaped by reciprocal interactions among personal factors, behavior, and the environment, highlighting learners' capacity to regulate emotions and adjust strategies to improve outcomes [37]. Zimmerman (1989) further emphasized that learners actively manage and participate in learning through self-regulatory processes [38]. Accordingly, SRL can be understood as learners' active regulation of learning activities across metacognitive, motivational, and behavioral dimensions in pursuit of learning goals.

Oxford's S^2R Model extends SRL theory to language learning by organizing strategy use into four domains: cognitive strategies (processing and retaining information), motivational strategies (sustaining effort and engagement), affective strategies (managing anxiety and emotions), and social strategies (seeking assistance and collaborating with others). In addition, Guo *et al.* (2018) conceptualized self-regulatory coping for foreign language anxiety as a multidimensional construct, offering relevant item sources for affect regulation in language learning. Together, these frameworks informed the operational definition of SRLSS and guided item development.

Given the limited availability of instruments targeting SRL strategies for listening-related anxiety, this study developed a new questionnaire focusing on SRL strategies for EFL listening anxiety. The initial item pool was primarily

adapted from Guo *et al.* (2018), Panadero *et al.* (2021), Wang and Cha (2019), and Xu and Kou (2015) [39,40].

3.2.3. Phase 3: Content validity assessment

Content validity, also referred to as theoretical analysis, concerns the extent to which an instrument adequately represents the intended construct [41]. Establishing content validity typically involves expert judgment to evaluate whether items sufficiently cover essential aspects of the construct and are appropriate for the target population. Taherdoost (2016) suggested that a judgmental approach to content validity requires collaboration with domain experts, and Boateng *et al.* (2018) emphasized that expert judges should have expertise in the domain and/or scale development [29,42]. Prior work has suggested that at least two experts are required to establish content validity [43,44].

In this study, a panel of five experts in educational psychology and foreign language education reviewed the preliminary items to evaluate relevance, clarity, and alignment with the intended constructs (**Table 1**).

Table 1. The panel of five experienced experts

Experts	Title	Academic expertise	Teaching Years
1	Professor	Translation	26
2	Associate-professor	Applied linguistics	14
3	Associate-professor	Statistics	10
4	Associate-professor	Translation	20
5	Lecturer	Teaching Education	12

Experts were selected based on qualifications, relevant experience, and academic background. They evaluated whether items adequately represented the constructs and provided suggestions to improve clarity and contextual appropriateness. Following theoretical mapping to the four strategy domains, the research team drafted an initial pool of 33 items, which was then reviewed by the same expert panel. Based on feedback, some items were adopted without modification when closely aligned with study objectives (e.g., “I talk with my classmates about light-hearted topics to relieve tension from listening exercises”; “I remind myself that English learning anxiety is common, and almost every learner may experience it”). Other items were reworded to fit a listening-specific context (e.g., adapting vocabulary-related items to “before listening to a new topic”), or modified to focus on listening comprehension (e.g., revising task-instruction items to “before starting a listening exercise”).

After translation into Chinese via a three-phase process, the draft SRLSS was administered to five second-year college students under realistic conditions to check item clarity, comprehension, and completion time (cognitive debriefing), rather than for statistical evaluation. A second expert review was then conducted to further refine the items. During this process, some items were removed due to ambiguity or insufficient relevance to listening (e.g., items referring to overly broad “study methods” or non-listening tasks). The refined 30-item SRLSS was subsequently subjected to empirical testing.

3.2.4. Phase 4: Scale evaluation and validation

A total of 500 first-year college students from four majors (marketing, international economics and trade, graphic design, and software engineering) participated in the pilot study.

To ensure data quality, responses were screened using the following criteria:

(a) Highly repetitive responses (≥ 80% identical Likert responses) [45,46];

(b) Excessive missing data (≥ 10% missing responses) [47];

(c) Anomalous responses (completion time < 60 seconds).

After screening, 452 responses were retained. The dataset was randomly split into two equal subsamples for cross-

validation: EFA was conducted on one half (n = 226) to explore the latent structure, and CFA was conducted on the other half (n = 226) to validate the proposed model.

EFA was first used to identify underlying structures in a dataset by grouping correlated variables into factors. The high KMO value (0.862) in **Table 2** indicates sufficient inter-correlations among items, making factor analysis appropriate. Additionally, Bartlett's Test of Sphericity ($\chi^2 = 3085.28$, $p < 0.001$) confirms that the correlation matrix is significantly different from an identity matrix, further supporting factor analysis.

Table 2. KMO test and bartlett's test of the 30-item srlSS (N = 226)

KMO value	Approximate chi-square	P	df
0.862	3085.28	<.001	435

Using exploratory factor analysis with varimax rotation, a four-factor solution was extracted, accounting for 60.49% of the total variance. Seven items were removed: items 1 and 20 due to substantial cross-loadings (i.e., loadings greater than .30 on two or more factors), and items 8, 16, 22, 23, and 30 due to insufficient primary loadings (i.e., loadings less than .50 on all factors), following the recommended criteria.

The factor loadings (**Table 3**) indicate distinct groupings of items based on self-regulation strategies as follows:

(1) Social strategies: Items 19, 21, 17, 6, 7, 18, and 26 load strongly, suggesting they measure a common construct related to sociocultural contexts and communication;

(2) Motivational strategies: Items 14, 13, 12, 15, 11, 10, and 24 exhibit strong loadings, likely aligning with motivational strategies, which involve positive self-talk, self-imagery, and other self-regulatory techniques to sustain motivation;

(3) Affective strategies: Items 27, 28, 9, 29, and 25 demonstrate strong factor loadings, indicating their association with affective strategies, which help learners regulate their emotions and manage affective states effectively;

(4) Cognitive strategies: Items 2, 3, 4, and 5 load well onto a distinct factor, likely representing cognitive strategies, which facilitate information retention and the processing of new ideas, sounds, and experiences.

Table 3. Varimax rotated loading of 23 SRLSS items in the final EFA model

Items	SS	MS	AS	CS
19. Talk with the teacher about difficulties	0.83			
Answer questions in class	0.802			
17. Invite classmates to study together	0.721			
6. Summarize key learning points	0.639			
Develop phased study plans	0.582			
18. Talk with classmates about difficulties	0.575			
26. Talk about casual topics with classmates to relieve stress	0.528			
Remind myself to do my best		0.753		
Remind myself to stay focused on relevant information		0.714		
Believe listening is not difficult		0.713		
15. Attribute difficulty to study methods rather than my ability		0.603		
11. Believe I can learn English well		0.598		
Tell myself anxiety is normal		0.550		

Table 3 (Continued)

Items	SS	MS	AS	CS
24. Reassure myself about incomplete understanding		0.506		
27. Practice in a quiet environment			0.779	
28. Listen to music to divert attention			0.673	
Reward myself to reduce anxiety			0.470	
29. Practice different test formats before exam			0.453	
25. Finish listening homework on time			0.451	
3. Read instructions carefully				0.68
4. Highlight key words in questions				0.655
5. Predict what will happen next				0.61
2. Review relevant background knowledge				0.547

The reliability analysis results indicate strong internal consistency across the four extracted factors and the overall scale (**Table 4**).

Table 4. Reliability statistics of the final 23-item SRLSS (N = 226)

Factors	Cronbach's alpha coefficient	Standardized Cronbach's alpha coefficient	Number of items
Social strategies	0.862	0.862	7
Motivational strategies	0.871	0.876	7
Affective strategies	0.868	0.873	5
Cognitive strategies	0.758	0.762	4
Total	0.913	0.914	23

Additionally, item-total statistics were examined using the control variable method, which evaluates changes in the corrected item-total correlation (CITC) and Cronbach's α when an item is removed. The results showed that removing any of the 23 items reduced both CITC and Cronbach's α, indicating that all items contributed positively to the scale's internal consistency.

Then, the CFA was conducted with AMOS 29.0 to confirm the factor structure. The t-value and loading of each item were listed in **Table 5.** All the items showed significant unstandardized factor loadings ($p < 0.001$), with t-values well above the threshold of 1.96, indicating that each item significantly contributed to its corresponding latent factor.

Table 5. Unstandardized factor loadings, standard errors, t-values, and significance for each item for SRLSS

Factor	Item	Estimate	S.E.	C.R. (t)	P
CS	CS1	1	—	—	—
CS	CS2	0.67	0.1	6.686	***
CS	CS3	0.473	0.101	4.679	***
CS	CS4	1.029	0.147	6.984	***
MS	MS1	1	—	—	—
MS	MS2	0.821	0.08	10.236	***
MS	MS3	1.159	0.087	13.267	***

Table 5 (Continued)

Factor	Item	Estimate	S.E.	C.R. (t)	P
MS	MS4	1.132	0.087	12.997	***
MS	MS5	1.161	0.087	13.366	***
MS	MS6	0.925	0.086	10.788	***
MS	MS7	0.661	0.072	9.14	***
SS	SS1	1	—	—	—
SS	SS2	0.843	0.106	7.983	***
SS	SS3	0.933	0.116	8.048	***
SS	SS4	1.161	0.126	9.185	***
SS	SS5	0.391	0.073	5.39	***
SS	SS6	1.055	0.125	8.467	***
SS	SS7	1.216	0.134	9.078	***
AS	AS1	1	—	—	—
AS	AS2	1.03	0.094	10.98	***
AS	AS3	1.057	0.096	10.971	***
AS	AS4	1.301	0.132	9.857	***
AS	AS5	0.999	0.091	10.959	***

The CFA results (**Table 6**) suggested that the four-factor measurement model provided an adequate fit to the data. The χ^2/df ratio was 2.575, and the incremental fit indices were close to conventional cutoffs (GFI = 0.854, AGFI = 0.821, CFI = 0.877, TLI = 0.861). The RMSEA was 0.073 with a 90% confidence interval of [0.066, 0.081], indicating an acceptable level of approximate fit. Although the RMR was slightly higher than the recommended guideline (RMR = 0.099) and the χ^2 test was statistically significant ($p < .001$), this is common in CFA with moderate sample sizes and model complexity. Overall, the pattern of fit indices supports retaining the proposed structure as a reasonable measurement model, which can be used for subsequent reliability estimation and validity-related analyses.

Table 6. Goodness of fit for the 4-factor measurement model of the SRLSS

Model	χ^2/df	CFI	TLI	IFI	GFI	RMR	RMSEA (90% CI)
Four-factors	2.575	0.877	0.861	0.878	0.854	0.099	0.073 [.066, .081]

Note: df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; IFI = Incremental Fit Index; GFI = Goodness-of-fit Index; RMR = Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90% CI = 90% confidence interval.

The CFA results for standardized factor loadings and reliability indices **(Table 7)** indicated that, although the AVE values for some constructs (e.g., CS and SS) were below the commonly recommended criterion of 0.50, the composite reliability and Cronbach's α for all factors exceeded 0.70, suggesting satisfactory internal consistency. As noted by Malhotra and Dash (2011) and supported in similar scale-development work (e.g., Guo *et al*., 2018), when AVE is modest, adequate composite reliability may still provide acceptable evidence for construct reliability, especially in early-stage instrument development [48]. Therefore, these factors were retained for subsequent analyses. The finalized 23-item SRLSS was then established for administration in the main study (see **Appendix I**).

Table 7. Standardized loadings and reliability indicators for each factor

Factor	Item	Standardized Loading (λ)	AVE	CR
CS	CS1	0.616	0.380	0.707
	CS2	0.496		
	CS3	0.622		
	CS4	0.712		
MS	MS1	0.532	0.506	0.875
	MS2	0.726		
	MS3	0.627		
	MS4	0.809		
	MS5	0.781		
	MS6	0.809		
	MS7	0.647		
SS	SS1	0.634	0.373	0.806
	SS2	0.551		
	SS3	0.606		
	SS4	0.646		
	SS5	0.559		
	SS6	0.607		
	SS7	0.665		
AS	AS1	0.687	0.598	0.853
	AS2	0.691		
	AS3	0.744		
	AS4	0.742		
	AS5	0.662		

4. Discussion

This study aimed to develop and validate a context-appropriate instrument for assessing self-regulated learning strategies in EFL listening among Chinese tertiary learners. Addressing RQ1, the SRLSS was generated through a theory-informed development process that integrated SRL models and language learning strategy frameworks while foregrounding listening-related affect regulation, a dimension that is particularly salient in Chinese tertiary EFL classrooms where listening tasks often elicit anxiety, tension, and confidence fluctuations. Rather than relying on general strategy taxonomies alone, the item pool also drew on prior Chinese EFL research that explicitly targets self-regulatory coping strategies for language anxiety, which strengthened contextual relevance and improved construct coverage for both listening performance regulation and emotional challenge management.

Through iterative refinement across the development phases, the SRLSS retained items that were conceptually aligned with SRL as a multidimensional regulatory system and meaningful for the listening demands faced by the target population. With respect to RQ2, the scale demonstrated a stable and interpretable internal structure for listening SRL. Using a split-sample cross-validation design, the EFA supported strong sampling adequacy and yielded a coherent four-factor solution explaining 60.49% of the variance. The resulting factors, Social, Motivational, Affective, and Cognitive Strategies, are theoretically consistent with contemporary SRL perspectives that view regulation in listening as more than cognitive control, encompassing motivational maintenance, emotion management, and socially mediated regulation. Importantly, the four-factor pattern reinforces the understanding that SRL in listening operates as an interconnected system: learners regulate listening comprehension not only through task-processing strategies (e.g.,

attention focus, prediction, and monitoring) but also through motivational self-support, anxiety reduction, and help-seeking or peer/teacher interaction when comprehension breaks down.

The CFA results further addressed RQ2 by indicating that the proposed four-factor measurement model provided an adequate representation of the data. All items loaded significantly on their intended factors ($p < .001$), and the overall fit indices suggested reasonable model adequacy ($\chi^2/df = 2.575$; GFI = 0.854; AGFI = 0.821; CFI = 0.877; TLI = 0.861; RMSEA = 0.073, 90% CI [0.066, 0.081]). Although the RMR slightly exceeded common guidelines and the χ^2 test was significant, such patterns are not uncommon in CFA for newly developed multi-factor instruments with moderately sized samples. Taken together, these results support the four-factor SRLSS as a defensible measurement model for capturing strategic self-regulation in EFL listening among Chinese tertiary learners.

Regarding RQ3, the SRLSS showed satisfactory reliability and initial construct validity evidence for listening SRL. Internal consistency was strong for the total scale and acceptable to strong across the subscales ($\alpha = 0.913$ overall; $\alpha = 0.758–0.871$ across factors), and item-total diagnostics indicated that each retained item contributed positively to reliability. CFA-based indicators further supported score dependability. While the AVE values for some factors (e.g., CS and SS) were below the conventional 0.50 threshold, composite reliability and Cronbach's α values exceeded 0.70, suggesting adequate internal coherence at this stage of instrument development.

Consistent with established psychometric guidance, factors with modest AVE may be retained when reliability is adequate and the constructs are theoretically essential, particularly for applied measurement in complex learning domains such as listening. Overall, the SRLSS appears to be an acceptable and context-sensitive tool for profiling how Chinese tertiary EFL learners self-regulate listening comprehension and listening-related anxiety.

5. Implications and future directions

The findings offer several theoretical, methodological, and practical implications for SRL research and EFL pedagogy in Chinese tertiary settings. Theoretically, the emergence of a four-factor structure provides empirical support for conceptualizing SRL strategies as a multidimensional regulatory system encompassing cognitive, motivational, affective, and social domains. This structure aligns with SRL models that emphasize not only planning and monitoring but also the regulation of motivation and emotion under challenge, suggesting that affective self-regulation and socially mediated regulation are not peripheral but constitutive elements of SRL strategy use in language learning contexts. In particular, the prominence of affective strategies is consistent with the argument that regulating anxiety and sustaining confidence are integral mechanisms through which SRL may support persistence and performance in demanding EFL tasks.

Methodologically, this study contributes a transparent and replicable scale-development pathway by combining a structured development framework with a split-sample EFA-CFA validation design. The use of EFA to refine items and identify the latent structure, followed by CFA to cross-validate the measurement model, strengthens the interpretability of the SRLSS and reduces the risk of capitalization on chance. At the same time, the psychometric pattern, especially the acceptable fit indices alongside modest AVE values for some factors, indicates the importance of continuing to accumulate validity evidence. Future research could extend the validity argument through additional analyses such as test–retest reliability, measurement invariance across gender or proficiency groups, and evidence based on relations to external variables (e.g., listening achievement, self-efficacy, and language anxiety), thereby strengthening the generalizability and utility of the scale in broader Chinese tertiary EFL populations.

Practically, the SRLSS provides an actionable diagnostic tool for identifying learners' strengths and weaknesses across SRL strategy domains, which can inform targeted instructional interventions. Instructors may use the scale to design differentiated SRL support that integrates cognitive strategy training with motivational enhancement, affect regulation techniques, and structured opportunities for help-seeking and peer collaboration. Such targeted instruction is likely to be particularly valuable in Chinese EFL settings where learners frequently encounter performance pressure and anxiety-related barriers, and where sustainable strategy use depends on learners' perceived usefulness and emotional experience

of regulation practices. In this way, the SRLSS can support both research-driven profiling and classroom-based SRL intervention design, contributing to more sustainable and context-sensitive strategy instruction in tertiary EFL education.

Future research should extend the validity argument for the SRLSS in several ways as outlined:

(1) The temporal stability and instructional sensitivity of SRLSS scores should be examined through test–retest designs and listening-focused SRL intervention studies to determine whether the instrument can capture meaningful change over time;

(2) Measurement invariance across key subgroups (e.g., gender, proficiency levels, majors, and instructional tracks) should be tested to ensure that comparisons of listening SRL profiles are interpretable and unbiased;

(3) Validity evidence based on relations to external variables should be strengthened by evaluating concurrent and predictive associations with listening achievement, listening self-efficacy, and listening anxiety;

(4) Replication across different regions and institutional types in China is needed to evaluate the generalizability of the factor structure and to support broader applications of the SRLSS in Chinese tertiary EFL listening research.

6. Appendix I: Self-regulation strategies for listening anxiety scale

1=Strongly disagree，2=Disagree, 3=Neither agree nor disagree，4=Agree,5=Strongly Agree

Item	Aspects	1	2	3	4	5
1	I review relevant background knowledge related to the topic before doing a listening exercise.					
2	I carefully read the instructions before starting a listening exercise.					
3	I highlight key words in the listening questions.					
4	I use existing clues to predict what will happen next.					
5	I summarize key learning points even when the teacher does not explicitly require it.					
6	I develop phased study plans to reduce the anxiety caused by English listening.					
7	I tell myself that feeling anxious about English listening is normal and part of the learning process.					
8	I tell myself that I am just as intelligent as my classmates and that I can learn English well.					
9	I tell myself that listening material is not as difficult as I imagined and I can complete it.					
10	If a listening task is difficult, I tell myself to stay focused and try to grasp some relevant information.					
11	When I feel anxious during a listening task, I remind myself to do my best.					
12	I believe my difficulty in English listening is due to my study methods rather than my ability.					
13	I take the initiative to invite classmates to study English listening together so as to reduce anxiety					
14	I take the initiative to talk with classmates about the feelings and difficulties in English listening learning so as to reduce anxiety.					
15	I take the initiative to talk with the teacher about my English listening learning difficulties so as to reduce anxiety.					
16	I reward myself with something I like so as to reduce anxiety when I feel anxious in English learning.					
17	I take the initiative to answer questions in class.					
18	I reassure myself that it is acceptable not to fully understand everything in a listening task.					
19	I finish my listening homework on time instead of late.					
20	I talk with my classmates about casual topics to relieve listening-related stress.					
21	I choose to practice listening in a quiet and comfortable environment to enhance concentration.					
22	I listen to music to divert my attention when I feel anxious during English listening.					
23	I practice different listening test formats before an exam to reduce test anxiety.					

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