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FROM AWARENESS TO UNDERSTANDING: HOW METACOGNITION SUPPORTS ACADEMIC LISTENING IN ENGLISH

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ABSTRACT

Students' metacognitive and listening skills are one of the key indicators of overall academic success in settings where English is taught as a foreign language or used as a medium of instruction. This study examines the relationship between metacognitive awareness strategies and students' self-rated academic listening skills in English, with the aim to identify which dimensions of metacognition are most strongly associated with academic listening proficiency. A sample of $N = 91$ Croatian university sports students completed the Metacognitive Awareness Listening Questionnaire and the Academic Listening Self-rating Questionnaire. Descriptive results showed that students rated their academic listening ability at a moderate level, indicating partial awareness of the challenges involved in academic listening tasks. Canonical correlation analysis revealed a significant correlation between the Metacognitive Awareness Listening Questionnaire and Academic Listening Self-rating Questionnaire subscales, with three Metacognitive Awareness Listening Questionnaire subscales – 'Problem-solving', 'Planning and evaluation', and 'Directed attention' – emerging as the strongest predictors of students' academic listening proficiency, while 'Mental translation' and 'Person knowledge' did not show significant predictive value. These findings suggest that real-time metacognitive strategies – such as planning, directing attention, and problem-solving – play a more influential role in academic listening than learners' general knowledge or beliefs about their listening ability. The study further highlights the importance of incorporating explicit metacognitive strategy instruction into teaching English as a foreign language and English as medium of instruction courses in order to enhance students' academic listening awareness and support their overall academic performance.

KEY WORDS

quality education, effective learning, English-medium instruction, higher education

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INTRODUCTION

Listening plays an important role in communication and is one of the main skills needed for language acquisition. Foreign language learners spend up to 55% of their time engaged in listening activities [1], which highlights the importance of listening comprehension as a vital yet complex cognitive process in language learning.

Academic listening comprehension, as opposed to general listening comprehension that is influenced by both linguistic knowledge (such as vocabulary and grammar) and non-linguistic factors (such as learners' experience and their social and cultural environments) [2, 3], requires listeners to apply microskills (for instance, identifying relationships among discourse units) and to draw on their background knowledge relevant to the academic topic [4]. When these cognitive and contextual elements interact successfully, foreign language students not only respond more effectively to their academic demands but also strengthen their general listening abilities [5].

Within this process, metacognition stands as a crucial element for enhancing students' academic listening proficiency. Defined by Teng [6] as the awareness and regulation of learner's cognitive processes, metacognition encompasses the planning, monitoring, and evaluation of learning [7]. In listening specifically, metacognitive awareness enables learners to regulate comprehension through strategy use. In other words, metacognitive strategies, as a set of strategies used when compensating for missing skills and knowledge [8], help learners acquire, store, and manage information more effectively [9, 10].

In academic settings where English is taught as second (L2) or foreign language (EFL) or used as a medium of instruction (EMI), proficient academic listening skills are essential. These skills support students' understanding of course content, participation in academic tasks, and overall academic success. This need is particularly evident in non-English-speaking higher education contexts, where students often face challenges to comprehend lectures in English due to understanding difficulties related to unfamiliar intonation patterns, discipline-specific terminology, varying pace of speech, and/or inadequate teaching methodologies [11].

The need to support students' academic listening in EMI contexts has been recognised as a significant concern within the Croatian higher education system. Namely, following the implementation of the Bologna reform (2002), the country's accession to the European Union (2013), and the significant introduction of modern technology, English has gained prominent role in Croatian education. Even more, the expansion of EMI courses and programmes across Croatian universities has increased in recent years, raising the linguistic demands on both students and teachers. In other words, students are expected to follow and comprehend discipline-specific lectures, extract key information, and complete their academic tasks effectively in English. Among these, sports science programmes at the higher-education level stand out for its high linguistic and professional expectations. More precisely, as a discipline, sports science increasingly places demand on students to work with English-language research, professional guidelines, and international standards in areas such as coaching, performance analysis, and sports medicine. Also, sports science graduates often enter a global labour market where English serves as the dominant medium of their professional communication. As such, these factors call for effective academic listening in English essential for students' academic and professional success, as well as their future employability. Despite these growing challenges, this population of students has been largely overlooked in the existing EMI and listening research.

Given the aforementioned, the present study aims to explore the relationship between metacognitive awareness and self-rated academic listening skills in English among Croatian university sports students, with the broader purpose of identifying how metacognitive processes can be strengthened to improve students' academic listening performance and, ultimately, their academic success. To achieve this, the following research questions were posed:

RQ1: Is there a relationship between metacognitive strategies and self-rated awareness of academic listening skills in English among Croatian sports students?

RQ2: Which metacognitive strategies are the predictors of students' academic listening skills?

LITERATURE REVIEW

METACOGNITION, L2 LISTENING, AND HIGER EDUCATION

Research in L2 listening has shown that successful academic listening relies on more than learners' linguistic competence alone. While vocabulary and grammar are necessary for comprehension, they are insufficient for managing the cognitive demands of real-time spoken input. [12] demonstrated that effective listeners use a wide range of listening strategies to compensate for gaps in linguistic knowledge, while [13] likewise argued that linguistic knowledge alone is insufficient, as listeners must strategically control cognitive operations such as segmentation and hypothesis testing during real-time comprehension.

Within this framework, metacognition plays a central role in listening comprehension. Metacognitive regulation allows learners to anticipate content, monitor understanding, and adjust strategies when comprehension lacks [14, 15]. Rather than passively decoding input, skilled listeners actively engage with spoken language, testing hypotheses and revising interpretations as new information becomes available. This strategic control of listening has been shown to be particularly important in academic contexts, where extended discourse, complex content, and limited opportunities for clarification place high cognitive demands on learners.

Furthermore, metacognition is also a core component of self-regulated learning (SRL), which emphasises learners' ability to manage their cognitive, motivational, and behavioural resources in goal-directed tasks [16]. From an SRL perspective, effective academic listening requires learners to plan how to approach a listening task, monitor their comprehension during the task, and evaluate outcomes afterwards. Research in language learning has shown that learners with stronger metacognitive regulation tend to achieve better outcomes across skills, including listening [17]. In listening specifically, studies using the Metacognitive Awareness Listening Questionnaire (MALQ) have demonstrated that metacognitive awareness predicts listening performance even when linguistic knowledge is taken into account [18].

Despite the growing recognition of metacognition as a key factor in listening comprehension [19], research focusing explicitly on academic listening in higher education remains comparatively limited. Much of the existing literature addresses general listening proficiency or targets younger learners, offering limited insight into the demands of listening in university-level academic settings. However, a small number of studies have begun to examine metacognitive regulation in academic listening contexts. Mohammad et al. [20], for instance, found that planning and evaluation strategies were strong predictors of postgraduate students' lecture comprehension. Similarly, Fu et al. [21] reported a significant relationship between metacognitive awareness and academic listening performance among Chinese university students. Using a combination of questionnaire and neurocognitive data, Zhai and Aryadoust [22] further demonstrated that specific metacognitive dimensions – particularly planning and directed attention – play a critical role in processing complex academic listening tasks. More recently, Zhou and Thompson [23] showed that university students who actively engaged in metacognitive strategies during EMI lectures demonstrated stronger comprehension and greater ability to integrate disciplinary content.

Nevertheless, the broader literature on metacognitive listening strategies continues to prioritise general listening proficiency rather than discipline-specific or lecture-based listening in higher

education. Numerous studies have shown that metacognitive strategy instruction improves overall listening performance [24, 25], yet these findings are often based on non-academic listening tasks or mixed learner populations. Moreover, a considerable portion of the research has focused on secondary-school learners, limiting its applicability to university contexts where listening involves sustained attention, specialised terminology, and conceptual integration [26]. To date, no published studies have explored the relationship between metacognitive awareness and academic listening skills among university students, nor among sports science students, a group increasingly required to engage with discipline-specific content in English.

Taken together, existing research provides strong evidence that metacognitive regulation is fundamental to successful L2 listening. However, there remains a need for more focused investigation into how metacognitive strategies support academic listening in higher education, particularly in EMI settings. Addressing this gap is essential for understanding how university students manage the linguistic and cognitive challenges of academic listening and how metacognitive awareness contributes to effective participation in English-dominant academic environments.

METHODS

PARTICIPANTS

The present study was conducted with a randomly selected sample of $N = 91$ sports students ($M = 38$, $F = 53$; age 21,1 ± 1,9) from a public university in Croatia. The inclusion criterion was that they had learned English through primary and secondary school (12 years in total) and had completed one mandatory English language course as part of their sports study programme. The specific demographic and academic characteristics of the sample population are systematically presented in Table 1.

Table 1. Students' background information.

Variable		Percentage, %
Grammar secondary school		29
Vocational secondary school		71
Average grade for English at secondary school	excellent	42
	very good	25
	good	33
Additional English language subject		42
Categorized as an athlete		88 (without categorization)
Involvement in professional sport		50 (active more than 5 years)
Travel to international countries where English is used for communication		79
Purpose of the travel	sport competitions	3
	private reasons	66
	not declared	31

INSTRUMENTS

For the purpose of this research, the survey was conducted using two standardized measuring instruments: the Metacognitive Awareness Listening Questionnaire (MALQ) developed by Vandergrift et al. [27] and the Academic Listening Self-Rating Questionnaire (ALSA) developed by Aryadoust et al. [28].

The MALQ questionnaire comprises 21 statements related to five second language (L2) listening comprehension process factors (subscales): 'Problem-solving', 'Planning and evaluation', 'Mental translation', 'Person knowledge', and 'Directed attention'. All the questions that could be answered quantitatively were asked using a six-point Likert scale (1 – Strongly disagree, 2 – Disagree, 3 – Partially disagree, 4 – Partially agree, 5 – Agree, and 6 – Strongly agree). The participants were asked to choose the option that best corresponded to their opinion on the awareness of metacognitive strategies, i.e. to their listening strategies that they applied during comprehension tasks. The MALQ was selected because of its established validity and reliability in evaluating metacognition and because of its vast and various uses in previous studies on metacognitive awareness in different language learning settings.

The ALSA questionnaire is composed of 47 statements related to six factors (subscales): 'Linguistic components and prosody', 'Cognitive processing skills', 'Memory and concentration', 'Note-taking', 'Relating input to other materials', and 'Lecture structure'. Each of the 47 statements was grouped according to the six factors in the questionnaire. All the questions that could be answered quantitatively were collected using a four-point Likert scale (1 – Not at all well, 2 – Not well, 3 – Well, and 4 – Very well). The participants were asked to choose the option that best indicated their self-assessment of their academic listening ability level. The ALSA was also selected because of its established validity and reliability in evaluating students' awareness of their academic listening ability and of the elements of academic discourse that may affect their academic achievement.

The questionnaire also included demographic data on the students' background education, additional language knowledge, and experience travelling abroad, Table 1.

DATA COLLECTION

The data for this study were collected via an online survey facilitated through Google Forms. The research was conducted from December 2023 to February 2024 during the first academic semester of the 2023-2024 academic year. The participants were provided with the survey link and detailed instructions on anonymity and voluntary participation. There were no time restrictions. The participants were also informed about the Common European Framework of Reference for Languages (CEFR) [29] standards and principles. The study protocol followed the guidelines stated in the Declaration of Helsinki. This ensured clear and allied responses.

DATA ANALYSIS

All the data presented in this research were analysed using the statistical software package Statistica 14.1.0.8. (Cloud Software Group, Inc. 2023). Descriptive statistics, including the mean, standard deviation, frequency, minimum and maximum values, skewness, and kurtosis, were calculated to obtain insight into the participants' responses. Moreover, the Kolmogorov–Smirnov test was used to test the normality of all the data. All the data were tested for univariate outliers, and none were found. To inspect the correlation between two sets of subscales, canonical correlation analysis (CCA) was applied. In doing so, the coefficient of canonical correlation (CanR), coefficient of canonical determination ($CanR^2$), Bartlett chi-square test (χ^2), degree of freedom (df), and level of statistical significance (p) were determined. The type I error was set at $\alpha = 5\%$. Pearson correlation coefficients were also calculated among all MALQ and ALSA subscales.

RESULTS

Prior to the analysis, all variables were tested for normality using the Kolmogorov-Smirnov test. The results revealed that all the subscales had distributions that did not differ significantly from the normal distribution (p values ranging from $p > 0{,}10$ to $p > 0{,}20$).

The reliability analysis indicated acceptable to high internal consistency for both the MALQ and ALSA subscales. For the MALQ, Cronbach's α values were: 0,08 for 'Planning and evaluation', 0,67 for 'Directed attention', 0,72 for 'Person knowledge', 0,77 for 'Mental translation', and 0,87 for 'Problem-solving'. For the ALSA, Cronbach's α values were: 0,91 for 'Linguistic components and prosody', 0,73 for 'Memory and concentration', 0,93 for 'Cognitive processing skills', 0,76 for 'Relating input to other materials', 0,82 for 'Note-taking', and 0,96 for 'Lecture structure'.

To develop more systematic data on the MALQ subscales and address the normality of the data on all subscales, descriptive statistics (mean, standard deviation, minimum and maximum values, skewness, and kurtosis) were collected and are depicted in Table 2.

Table 2. Descriptive statistics of the MALQ subscales.

Subscale	M ± SD	Min.	Max.	Skewness	Kurtosis
'Planning and evaluation'	3,90 ± 0,95	2,00	6,00	0,19	–0,47
'Directed attention'	3,93 ± 0,84	2,00	6,00	–0,04	0,08
'Person knowledge'	3,78 ± 0,93	1,67	6,00	0,10	–0,27
'Mental translation'	3,92 ± 1,22	1,00	6,00	–0,41	–0,41
'Problem-solving'	4,29 ± 0,90	2,00	6,00	–0,25	0,25

The results in Table 2 indicate that the maximum values remain constant and that the minimum values increase from one to two. Interestingly, the maximum value of six is constant for all the subscales, whereas the minimum value increases from one to two for all the subscales. In addition, the parameters describing the distribution are consistent. Moreover, since skewness and kurtosis are observed, we may additionally conclude that the data are normally distributed.

Furthermore, the mean, standard deviation, minimum, maximum, skewness, and kurtosis values are also presented (Table 3) for each of the independent variables (six subscales of the ALSA).

Table 3. Descriptive statistics of the ALSA subscales.

Subscale	M±SD	Min.	Max.	Skewness	Kurtosis
'Linguistic components and prosody'	3,03 ± 0,52	1,55	4,00	–0,24	0,22
'Memory and concentration'	2,78 ± 0,57	1,00	4,00	–0,13	0,24
'Cognitive processing skills'	2,98 ± 0,57	1,36	4,00	–0,41	0,42
'Relating input to other materials'	2,91 ± 0,59	1,00	4,00	–0,41	0,88
'Note-taking'	2,84 ± 0,63	1,00	4,00	–0,35	0,15
'Lecture structure'	2,85 ± 0,59	1,07	4,00	–0,44	0,32

Table 3 reports that the overall variables' scores range from one to four. The maximum and minimum values remain constant in all subscales, which points to the relative consistency of the data. The MALQ data indicate that the ALSA subscales also have the same statistical distribution suitable for further parametric statistical analyses. It can be inferred that the sample used does not differ from that investigated by Deb [30].

Moreover, to provide a comprehensive overview of the relationship among the variables included in the canonical correlation analysis, Pearson correlation coefficients were calculated among all MALQ and ALSA subscales, Table 4.

As shown in Table 4, moderate to strong positive correlations were observed among the MALQ subscales, while the ALSA subscales showed consistently strong intercorrelations. Correlations between the MALQ and ALSA subscales were generally low to moderate, indicating meaningful relationships between the two variable sets while suggesting that the constructs remained empirically distinct.

Table 4. Pearson correlation matrix of the MALQ and ALSA subscales.

	Subscale										
MALQ	'Planning and evaluation'										
	'Directed attention'	0,71									
	'Person knowledge'	0,47	0,61								
	'Mental translation'	0,60	0,57	0,47							
	'Problem-solving'	0,78	0,77	0,49	0,58						
ALSA	'Linguistic components and prosody'	0,36	0,26	0,11	0,08	0,35					
	'Memory and concentration'	0,35	0,22	0,15	0,10	0,32	0,93				
	'Cognitive processing skills'	0,37	0,27	0,13	0,07	0,36	0,98	0,94			
	'Relating input to other materials'	0,39	0,26	0,15	0,09	0,38	0,96	0,93	0,98		
	'Note-taking'	0,39	0,30	0,13	0,13	0,37	0,96	0,92	0,95	0,93	
	'Lecture structure'	0,39	0,29	0,17	0,09	0,37	0,97	0,93	0,98	0,96	0,97

The relationships between the two sets of variables were further examined using canonical correlation analysis, the results of which are presented in Table 5.

Table 5. Canonical correlation analysis: canonical structure coefficients and overall canonical function statistics.

Subscale		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
MALQ	'Planning and evaluation'	0,80	0,02	–0,52	0,28	0,10
	'Directed attention'	0,70	0,20	–0,07	0,72	–0,25
	'Person knowledge'	0,19	–0,63	–0,15	0,64	–0,27
	'Mental translation'	0,29	0,12	–0,80	0,45	–0,36
	'Problem-solving'	0,89	0,07	–0,26	0,17	–0,50
ALSA	'Linguistic components and prosody'	0,97	0,10	–0,13	–0,05	0,26
	'Memory and concentration'	0,67	–0,11	–0,32	–0,04	0,46
	'Cognitive processing skills'	0,94	0,02	–0,10	–0,08	0,30
	'Relating input to other materials'	0,91	–0,06	–0,21	–0,11	0,14
	'Note-taking'	0,85	0,17	–0,25	0,15	0,26
	'Lecture structure'	0,88	–0,03	–0,10	0,10	0,23

Note: CanR = 0,65; $CanR^2 = 0,42$; $\chi^2(30, N = 91) = 82,59$ and $p < 0,01$.

As shown in Table 5, the first canonical function was statistically significant, yielding a canonical correlation of 0,65 ($CanR^2 = 0,42$), $\chi^2(30, N = 91) = 82,59$, and $p < 0,01$), indicating a moderate relationship between the MALQ and ALSA variable sets. Although only the first canonical function detected statistical significance, the structure coefficients for all five canonical functions are presented to provide a comprehensive overview of the canonical solution. The first canonical function was primarily defined by the MALQ subscales 'Problem-

solving', 'Planning and Evaluation', and 'Directed Attention', which showed the strongest positive loadings. On the ALSA side, all six subscales loaded strongly on the first canonical function, indicating that higher levels of these metacognitive listening strategies were associated with higher perceived academic listening awareness. In contrast, 'Mental Translation' and 'Person Knowledge' contributed only weakly to the first canonical function.

DISCUSSION

The results of the descriptive statistics revealed that students use a moderate level of metacognitive awareness across all MALQ subscales ($3{,}78 \leq M \leq 4{,}29$), with 'Problem-solving' emerging as the most frequently used strategy. This indicates that students apply strategic thinking when they encounter comprehension difficulties, but they may not consistently plan, monitor, or evaluate their listening processes throughout academic tasks. In practical terms, students might be able to overcome specific difficulties as they arise, yet still struggle with sustaining attention, anticipating basic ideas, or checking comprehension during complex academic listening, especially in EMI lectures and discipline-specific sports science contexts. Similarly, all ALSA subscales also reflected moderate levels of self-rated academic listening ability ($2{,}78 \leq M \leq 3{,}03$), indicating that students perceived themselves as reasonably competent, yet still developing, in academic listening. The lower scores on the 'Memory and concentration' and 'Note-taking' subscales suggests that students are aware that they struggle most with staying focused, remembering information, and writing down key points during academic listening. For sports students in particular, weaker performance on components such as memory, concentration and note-taking may have practical consequences for their academic and professional development. Sports science as a discipline frequently relies on specialised terminology, tactical explanations, and evidence-based training principles. If students struggle to retain information during lectures or extract key points through effective note-taking, they may find it difficult to follow theoretical explanations in physiology and biomechanics, understand coaching rationale, or apply sports medicine guidelines in practice. Consequently, insufficient metacognitive support may not only affect their listening comprehension in EMI courses but also limit their ability to transfer academic knowledge into professional contexts such as coaching, performance analysis, and athlete development. In brief, this pattern implies a realistic self-assessment rather than an overestimation of ability, which is consistent with research showing that EFL learners often struggle most with cognitive processing during fast, complex, academic listening [28]. Taken together, these findings suggest that students possess an emerging but incomplete awareness of the demands of academic listening and may therefore have difficulty using adequate metacognitive strategies without explicit instruction.

Furthermore, regarding the first research question, the canonical correlation analysis revealed a statistically significant and moderately strong relationship between the MALQ and ALSA subscales ($CanR = 0{,}65$; $CanR^2 = 0{,}42$, $p < 0{,}01$), suggesting that students who reported higher levels of metacognitive strategy use tend to rate their academic listening abilities more positively. This suggests that they did not apply their metacognitive skills and knowledge consistently while engaging across academic listening tasks. These findings are aligned with the previous research that concluded that L2 and EFL learners across wide-ranging proficiency levels exposed to different contexts typically use a moderate level of metacognitive strategies during listening tasks [31, 32]. A common explanation might be found in the nature of listening instruction throughout EFL educational system. Or, from a theoretical perspective, these findings might be explained within the SRL framework, which views metacognitive development as gradual and shaped by opportunities for reflection [33]. If learners are not explicitly taught to regulate comprehension throughout their EFL education, their metacognitive use remains limited – especially during cognitively demanding tasks such as academic listening [15].

In the Croatian EFL context, this moderate level might partially be due to the characteristics of secondary-school English instructions. In other words, English in Croatia is introduced early, but instructional emphasis – particularly in vocational schools – tends to prioritise vocabulary learning and general communicative competence rather than metacognitive knowledge and self-regulation. Studies show that the learner's early exposure to English as an EFL from primary school onwards has been confirmed to correlate with language proficiency levels later in life [34, 35]. Consequently, students accumulate linguistic knowledge without developing the SRL-based skills necessary for planning or monitoring comprehension during EMI lectures. Students in this study who completed vocational programmes had lower exposure to advanced English instruction and fewer opportunities to engage with academic input. In contrast, students who attended grammar secondary schools typically received four English lessons per week, studied Latin for two years, and learned at least one additional foreign language. Upon completion of grammar school and the final examination, these students usually achieved CEFR proficiency levels between B1 and B2 [29], gaining broader general English vocabulary and a more balanced development of language skills. Conversely, students from vocational schools generally received only two English lessons per week, did not study Latin or an additional foreign language, and primarily developed field-specific vocabulary depending on their vocational focus, resulting in lower proficiency levels (A2-B1). This difference in prior exposure and instructional depth could explain the limited metacognitive knowledge and moderate metacognitive skill use observed in the present sample at university level.

In order to detect more accurately the background exposure to English language use, we wanted to know students' purpose and frequency of their travel to international countries where they used English as a means of communication. We believe that in those contexts, students use their strategic knowledge or personal knowledge to benefit their understanding of the target language speech and instruction. In particular, if students are exposed to sports-specific listening contexts (such as completions), they must have processed information at the meta-level that draws upon metacognitive knowledge and skills [36, 37]. Thus, for the present study, it is possible that the participants, 79% had finished vocational secondary school and only 3% of them travelled for sports competition purposes, may have not received much listening instruction.

Regarding the second research question, the canonical correlation analysis revealed significant relationships between three MALQ subscales – 'Problem-solving', 'Planning/evaluation', and 'Directed attention' – and the overall ALSA subscales. These results support earlies findings suggesting that metacognitive skills, rather than metacognitive knowledge, are the significant predictors of listening performance in EFL learners [31]. In SRL context, these variables correspond to the performance phase of self-regulation, referring to strategic monitoring and control of cognitive activity during listening [38]. The students in this study might therefore rely primarily on procedural, task-focused strategies to deal with listening comprehension challenges rather than drawing on explicit knowledge about themselves as listeners or consciously avoiding translation.

Interestingly, among five subscales measured by the MALQ, subscales representing metacognitive knowledge – mental translation and person knowledge – did not significantly correlate with self-rated listening abilities. This partially contrasts previous findings that emphasised the role of directed attention as a frequently used subscale [9]. Namely, academic listening requires learners to engage in online processing and strategic attention diversion rather than retrospective knowledge about listening. Thus, procedural metacognitive regulation seems to play a more immediate role in academic listening performance than declarative metacognitive knowledge [12, 18].

The pedagogical implication is that explicit metacognitive instruction may be necessary for strengthening both types of metacognition, especially metacognitive knowledge, which

appears underdeveloped in this group. Namely, studies have reported that when students are given instructions on how to develop metacognitive knowledge and skills, they report using them more during listening tasks [39-41]. Yet Croatian EFL curricula focus more on improving language accuracy and receptive skills while paying comparatively less attention to metacognitive awareness or SRL strategy development, particularly in vocational programmes. As a result, many students enter EMI study programmes without the metacognitive preparation needed for academic listening.

Considering all of the aforementioned, these results highlight an important distinction between metacognitive skills and metacognitive knowledge. Students appear capable of applying procedural strategies (problem-solving and directed attention) but lack explicit knowledge about themselves as listeners. From a theoretical standpoint, this study therefore supports the view that SRL-related metacognitive processes are central to academic listening performance and extends previous findings by demonstrating this relationship among Croatian EFL university students in a discipline-specific context.

CONCLUSION AND IMPLICATIONS

Taken together, the findings of the present study clearly demonstrate that metacognition plays an important role in learners' academic listening proficiency in English. Regarding the first research question, the results of the canonical correlation analysis confirmed a statistically significant and moderately strong relationship between metacognitive awareness strategies and self-rated academic listening abilities among Croatian sports students. This suggests that students who report more frequent use of metacognitive strategies tend to perceive themselves as more competent in coping with the cognitive and linguistic demands of academic listening tasks in English.

With respect to the second research question, the analysis further indicated that specific metacognitive skills – namely, problem-solving, planning and evaluation, and directed attention – serve as meaningful predictors of perceived academic listening proficiency. In contrast, the two MALQ dimensions representing metacognitive knowledge (mental translation and person knowledge) did not significantly correlate with overall ALSA scores, and therefore cannot be considered strong predictors of academic listening proficiency in this context. These results are consistent with theoretical models of language proficiency which propose that linguistic knowledge and task-relevant cognitive processes form the basis of successful language performance, while personal beliefs and declarative knowledge contribute indirectly. Moreover, the present results support Borkowski et al. [42] claim that domain-specific knowledge is required if learners are to activate metacognitive resources effectively when engaged in complex listening tasks.

But several limitations need to be acknowledged. Including a broader range of language proficiency levels or learners from different university study programmes might provide us with a more representative picture of metacognitive awareness and academic listening ability. Likewise, adopting alternative methodological approaches – such as longitudinal designs, experimental interventions, or listening-performance measures – could provide deeper insight into changes in metacognitive behaviour over time or across different instructional contexts. In addition, although the sample size ($N = 91$) was sufficient for the present canonical correlation analysis, it was relatively modest in relation to the number of variables included. As a result, the obtained canonical coefficients and canonical correlation should be interpreted with certain caution since they may be somewhat sample-specific. Accordingly, in order to examine the stability of the canonical solution and provide cross-validated estimates of the observed relationships, future studies should definitely consider employing larger and more diverse samples. Finally, as both the MALQ and ALSA are self-report instruments, the findings reflect

participants perceived metacognitive awareness and academic listening ability rather than objectively measured behaviours or performance. Consequently, the observed relationships should be interpreted as associative rather than causal and may reflect participants' subjective perceptions rather than objectively measured abilities.

Despite these limitations, the present findings have important pedagogical implications. The demonstrated relationship between metacognitive strategies and academic listening performance underlines the need for EFL instruction that incorporates explicit metacognitive awareness training. Such an approach could help teachers assess learners' listening awareness more accurately, target instructional support more effectively, and prepare students more successfully for academic environments in which English functions as a medium of instruction. The results further suggest that metacognitive development should be recognised as a relevant dimension within multidimensional assessment models for EFL learners enrolled in EMI courses.

Finally, the insights gained from this study may assist university instructors of English for Specific Purposes in understanding the specific academic listening needs of sports science students. This knowledge can guide the design of discipline-relevant listening tasks that draw on students' existing competencies while fostering the metacognitive strategies required to process specialised discourse. In doing so, academic listening instruction may better support students' communication within their professional field and ultimately contribute to improved academic achievement and workplace readiness in globalised sports contexts.

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