

The Perceptual Load and its Effect in the Processing of Attention According to the Systems of Representation of Information (Audiovisual) in Coaches of the Age Groups of Football

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ABSTRACT:

Based on their predominant information representation method (auditory/visual), this research sought to determine how cognitive load affected young football coaches' attention processing. The issue arises from the high density of stimuli seen in current football training settings, and it is yet unknown how alternative representation systems affect attention efficiency at different levels of cognitive load, especially for coaches. Thus, the purpose of this research was to ascertain if the information representation system and the degree of cognitive load affect attention processing. The study population consisted of young coaches enrolled in a training program for the Iraqi Sports Federation. The research used a comparative experimental design. Auditory and visual performance were examined in two typical groups. Cognitive load and selective attention across four levels of visual stimuli were measured using an automated task. Performance metrics were response time, error count, and processing failure rate. The Kruskal-Wallis test was used to statistically assess the data. The first and fourth load levels revealed substantial differences in late selective attention, favoring the auditory system in both speed and accuracy, but there were no discernible changes in early selective attention between the auditory and visual systems. Additionally, processing failure peaked at the peak perceptual load, indicating that perceptual load plays a critical role in trainers' attentional processing efficiency.

Keywords: Cognitive Load; Selective Attention; Attention Processing; Information Representation Systems; Auditory System; Visual System; Age Group Coaches; Football.

1. INTRODUCTION

Football has evolved into a highly cognitively demanding environment in which players and coaches must quickly choose the most pertinent information while managing a multitude of

simultaneous cues, including opponent and teammate movements, open and closed spaces, and changes in the game's tempo. Football success is thus now seen to be the result of a complex interaction between selective attention, executive functions, and the capacity to process

information under pressure rather than being solely explained by physical and technical abilities. Recent assessments indicate that cognitive skills—which are associated with visual behavior, the ability to understand complex situations, and decision-making in dynamic contexts—are crucial components of football talent development settings (Haugan et al., 2025; Triggs et al., 2025).

Recent research has focused on the significance of executive functions and attention in exceptional athletic performance. However, research on task types, measuring instruments, and how closely they resemble real-world gaming environments continues to show a distinct methodological difference. Some studies focus on broad cognitive tests, while others focus on tasks more directly connected to situational success inside the game. Knöbel et al. (2025) and Triggs et al. (2025) state that this necessitates further conceptual and empirical definition of the relationship between football performance and attention, particularly in training environments and age groups where the coach is crucial in controlling responses and directing attention.

Despite the expansion of research on the cognitive aspects of football, the effect of cognitive load on attentional processing based on different information representation styles remains an important topic that requires more investigation. Although there is ongoing dispute on the explanatory usefulness of broad cognitive tests and their ability to predict real behavior in the context of football, current research suggests that executive functions and attention may be important in explaining performance under pressure. Furthermore, some recent studies have shown no appreciable differences in certain executive functions across groups that are supposed to differ, suggesting a disconnect between theoretical frameworks and real evaluation methods (Knöbel et al., 2025; Lehmann & Pietsch, 2025).

Thus, there is still much to learn about the relationship between cognitive load, selective attention, and information representation

systems, particularly in the context of Arab sports and among coaches that work with age-group teams. This work aims to solve this problem. The bulk of current research focuses on players or talent identification pathways, and there are currently few studies that link cognitive load to the coach's information representation technique. Thus, the primary issue driving this study is: Does the information representation system of age-group football coaches affect how attention is processed under different cognitive load levels? (Haugan et al., 2025; Triggs et al., 2025).

The relationship between an individual's cognitive traits and the cognitive demands of a sporting environment is one of the most recent advances in sports psychology and performance science, which makes this study significant. Football players must be able to choose pertinent information at the appropriate moment, block out distractions, and rearrange their response in response to changing circumstances in order to perform at a high level. Recent research has shown a broad correlation between executive functioning and cognitive ability and the ability to manipulate difficult situations and make quick choices under stress. As an end result, these factors are becoming more important in sports school learning and improvement programs (Haugan et al., 2025; Knöbel et al., 2025).

The take a look at's sensible utility, which provides a framework for school teachers and the growing atmosphere, which enhances their cognitive qualities, as well as showing its fees. Furthermore, it is miles helpful to observe the cognitive load of the coach rather than just the participant, as the coach is responsible for handling large amounts of data during drills and protests by focusing player attention on the most important indicators. Understanding the relationship between cognitive load and fact-instance structures may also help to elaborate more specific cognitive and attentional schooling processes adapted to schooling scenarios of existing game activities (Lehmann & Pietsch, 2025; Triggs et al., 2025).

This research is scientifically valid in its methodology, which goes as a well-known ability to just find interest. It explores it in the context of a comparative experimental paradigm that combines three overlapping axes: data visualization schemes, cognitive load, and selective attention. By examining whether variations in cognitive representation styles may affect the effectiveness of attentional processing as the demands of a cognitive task grow, this method adds a novel theoretical element to the study. Additionally, this approach responds to the call in recent literature for the development of more integrated models that integrate fundamental cognitive processes with the real-world performance requirements of football, as opposed to relying on broad, context-neutral measurements (Haugan et al., 2025; Knöbel et al., 2025).

Since most current research focuses on the player or emerging talent, this study also closes a theoretical and practical gap by emphasizing the coach as a target of cognitive examination. Because of this, the current study expands the field of sports cognition research to include key players in the training process and establishes the foundation for further studies to understand the relationship between the coach's cognitive characteristics and the quality of their decisions and preparation of the high-intensity training environment (Lehmann & Pietsch, 2025; Triggs et al., 2025).

2. LITERATURE REVIEW

Modern football is associated with a high degree of cognitive complexity. Players and coaches alike must constantly take in changing visual cues, recognize relevant signals fast, ignore distractions, and reorganize their responses to suit the needs of the scenario. According to this viewpoint, variations in performance can no longer be explained only by technical and physical skills. Today, cognitive language is crucial for understanding intelligence and diversity in fast-paced game scenarios. Mao et al. (2024) determined that gambling football is associated with significant improvements in children and

adolescents' working memory, attention, and inhibitory control. This supports the view that gambling football fosters a mentally taxing environment that will improve intellectual and physical abilities. In addition to physical exercise, the meta-analysis showed that environmental enrichment and nonstop involvement with situations may provide explanations for these outcomes as well as stressful anticipation, selective interest, and choice-making in different time constraints.

Based on this understanding, subsequent studies have aimed to identify the appropriate components that decorate overall performance in soccer, mainly the relationship between cognitive and motor talents in situations requiring rapid feedback and immediate stimulus version Horníková et al. (2025) found that reactive agility in young soccer players also explains speed and acceleration through more inhibitory visual control and choice-making speed Furthermore, having a look indicated that mixing of cognitive-motor modifiers may also account for a portion of the resulting performance variation of this Lactivity. Horníková et al. (2025) and Ltfi et al. (2025), who found a strong relationship between path preference, speed, and reactive agility. This means that rather than being separated into different physical and cognitive domain names, the overall performance of the football is the end result of a direct interaction between stimulus perception, interpretation, response selection, and execution in a faster time frame as an optional principal component. This emphasizes the need for further research examining the use of more targeted and beneficial strategies of this relationship.

Practically, models that resemble real-world gaming studies are beginning to look at replacing the latest laboratory cognitive tests according to Rudolph et al. (2026) study, cognitive motor training implemented in familiar discipline settings and included in soccer practice classes can further enhance cognitive motor overall and on-field performance without problems applicable to real-world scenarios than individual laboratory work. This approach is important

because it complements the ecological validity of training and assessment, bringing research findings to the reality of football coaching. For this reason, the techniques used in the current literature to assess cognitive abilities are not the best. Rather, it highlights the need of researching cognitive load, attention, and flexibility when it comes to football-specific characteristics like passing, movement, and motor reaction. According to Rudolph et al. (2026), this integration is thought to be the most realistic depiction of on-field performance.

Another equally significant concern has surfaced as scientific interest has increased: football players' cognitive abilities don't always function in impartial situations. It is also influenced by the physical and mental strain of competitive settings. According to Knöbel et al. (2024), the interpretation of findings is altered when executive functions are assessed in the particular context of the game and under psychophysiological conditions comparable to those necessary for competitiveness. This is due to the possibility that cognitive function may change between stressful and neutral circumstances. This finding is especially helpful for studies on cognitive load and attention. Recent research clearly supports more integrated theories that see attention in the context of sports as a result of the interaction of cognitive load with psychological and physical stress rather than merely as a cognitive activity independent of environmental circumstances. This is because, rather than receiving information in a vacuum from emotion, pressure, and effort, athletes and coaches get it in a complex environment where the demands of perception, executive organization, and motor response are interwoven (Knöbel et al., 2024).

Similarly, rather than being universally applicable, emerging study suggests that cognitive skills in football may be specialized depending on the position or situation in the game. For example, the goalie research by Nakagawa et al. (2025) shown that, because of the intense time constraint inherent in scenarios like penalty kicks, early anticipation and the utilization of initial

motor signals are more important than just reacting to the completed information with a delayed reaction. This finding suggests that not all players acquire cognitive skills to the same degree and that experience may result in certain kinds of cognitive competence pertinent to the nature of the work. It becomes clear how crucial it is to investigate attention and cognitive load in light of role-specific considerations since processing demands differ across players, between players and coaches, or between training and competing settings. Instead of focusing just on the player as the immediate reaction to the situation, this broadens the research to include the coach as a cognitive actor who must evaluate and organize a large number of simultaneous inputs in order to assist directing and decision-making.

The literature continues to show disparities in results as well as in measuring and interpretation techniques, despite the obvious advancements in this subject. While some studies highlight the significance of cognitive factors in performance interpretation, player level differentiation, and training effectiveness, others suggest that certain differences are not always obvious or that they rely on the type of instrument used and the performance measurement context. Additionally, research on coaches as cognitive actors is still scarcer and has a narrower explanatory depth than studies on players, especially junior or elite athletes, which make up the bulk of current literature. Therefore, it can be argued that there is a real need for research that looks beyond the player and examines how cognitive load interacts with the coach's information processing and attentional styles, particularly in age groups that need precise guidance and quick perception of behavioral and technical cues. This viewpoint provides the scientific basis for the present study. It adds a new dimension to the current literature and connects sports psychology, cognition, and practical coaching practice because it delves into a research area that still requires investigation, namely the intersection of cognitive load with information representation and attention processing systems among age-group football

coaches (Knöbel et al., 2024; Mao et al., 2024; Rudolph et al., 2026).

3. MATERIALS AND METHODS

3.1. Research Design

In order to investigate the impact of cognitive load levels on selective attention processing among age-group football coaches depending on their predominant information representation system (auditory/visual), this research used a comparative experimental design with computerized assessments. This strategy is consistent with recent research that highlights how central cognitive processes like visual attention, response selection, and processing of competing stimuli within the dynamic sporting situation impact football performance in addition to physical and technical attributes (Habekost et al., 2024, p. 2; Lochhead et al., 2024, p. 205). Additionally, systematic manipulation of load levels is appropriate for researching early and delayed attention selection since the idea of selective cognitive load implies that high load on the core task limits the resources available for processing distractions (Cui et al., 2025, p. 2).

3.2. Research Population and Sample

All 42 age-group coaches who took part in the training program run by the Iraqi Sports Federation in Baghdad during 2010 and 2011 made comprised the first study population. According to the statistical tables in the accompanying study, thirty coaches were divided into two groups based on their dominant information representation system: the visual group ($n = 16$) and the auditory group ($n = 14$). This allowed for an analytical comparison of the auditory and visual representation systems. When the objective is to explain differences in reaction speed and selection accuracy in light of cognitive differences across people within open sports situations, this kind of categorization is appropriate for research on athletic cognition (Su et al., 2024, p. 479; Triggs et al., 2025, p. 1).

3.3. Test Environment and Equipment

A standardized computerized testing environment was used for the experiment.

Within a fixed, almost square display area, visual stimuli were shown on a computer screen. The visual arrays were set up such that just the strength of the stimuli varied between trials, preserving the overall structure of the perceptual picture. Because computerized and repeatable video tasks provide standardized, repeatable conditions and allow for more objective measurement of accuracy and response time than traditional observation, this approach is consistent with current trends in mathematical cognition research (Lochhead et al., 2024, p. 205; Su et al., 2024, pp. 473–476).

3.4. Research Instruments

Two main tools were employed in the study: The first was an information representation systems scale intended to determine the individuals' predominant representational style (visual or aural). This size was suitable for the Iraqi environment, according to the first investigation. The second tool was a computerized visual search task that required the subject to choose a target stimulus among an increasing number of distracting stimuli in order to measure cognitive load and selective attention processing. Visual search and multi-item tracking tasks are among the most common methods for measuring selective attention and cognitive abilities related to football performance because they allow for a controlled increase in task complexity, whether by increasing the number of items, the number of targets, or the intensity of competition between stimuli (Habekost et al., 2024, p. 2; Su et al., 2024, p. 479).

3.5. Constructing the Perceptual Load Task

The perceptual load task relied on a gradual increase in the density of distracting stimuli presented to the trainer while searching for the target stimulus. According to the accompanying study, the experimental environment began with a preliminary level of 100 distracting stimuli, and the load then increased through four main analytical levels: 225, 400, 625, and 900 stimuli. These stimuli were distributed within quasi-square matrices as follows: 15×15 , 20×20 , 25×25 , and 30×30 respectively, ensuring an

increase in the density of visual elements within the display area with each transition to a higher load level. Progressive development of this kind is seen as a suitable methodological approach. This is consistent with contemporary experimental principles of perceptual load in attentional tasks since increasing the number of items to be visually scanned usually increases the demands on selective attention and decreases the resources available for processing irrelevant stimuli (Cui et al., 2025, p. 2; Su et al., 2024, pp. 476–477).

3.6. Visual Stimuli Characteristics

- A sports shirt was used as the visual unit for both the target stimulus and the distracting stimuli, with the physical size of the stimuli adjusted proportionally to the numerical increase on the screen. The dimensions of the stimuli at the 100-stimulus level were 1.3×1 cm, gradually decreasing to 0.3×0.2 cm at the 900-stimulus level, while the area of spread increased from 14.5×14.5 cm at the lower level to 19×19 cm at the higher level. This suggests that the study not only increased the number of elements but also heightened the cognitive load by decreasing the size of the stimulus and increasing the density of the visual scene. The literature (Lochhead et al., 2024, pp. 205–206; Su et al., 2024, p. 477) identifies presentation characteristics, the number of elements, and the difficulty of differentiating between the target and distractors as important factors that determine the difficulty of visual attention tasks in mathematical contexts. These findings are consistent with this approach.

3.7. Presentation Time and Procedural Sequence

- The stimuli presentation time was fixed at 1500 milliseconds for all trials to ensure uniformity of perceptual processing time across participants and levels. After classifying the coaches according to their dominant information representation system, each participant underwent a series of computerized trials in which they were required to identify the target stimulus as quickly and accurately as possible within the four levels of perceptual load. Fixing

the presentation time and standardizing the execution conditions are two essential elements in improving the internal validity of selective attention tasks, especially when the dependent variables are response time and the number of errors, which are the most common and sensitive indicators in this type of task (Cui et al., 2025, pp. 5–6, 10; Su et al., 2024, pp. 473–474).

3.8. Variables in the Study

- The independent variable was the levels of visual perceptual load as experimentally processed through the number, intensity, and physical characteristics of stimuli. The classificatory variable was the trainer's dominant information representation system (auditory/visual). The dependent variables were: Response time in attention tasks, Number of errors or incorrect responses, and Processing failure rate, represented by the inability to identify the target stimulus in some delayed selection tasks.
- Combining speed and accuracy in analysis is crucial. Because response time alone is insufficient to explain cognitive efficiency unless considered in conjunction with the appropriate performance level, particularly in sports situations that require rapid and accurate selection of relevant information (Cui et al., 2025, p. 10; Habekost et al., 2024, p. 12).

3.9. Statistical Analysis

- Records examined the use of statistical software SPSS. Descriptive information was also used to suggest categories based on frequency, probability, mainly cognitive load levels, and data visualization strategies. The significance of variations in mean ranks for reaction time and error count across various load levels was assessed using the Kruskal-Wallis test, as detailed in the original study, with a significance threshold of 0.05. Given the small sample size and reliance on performance variables that might not sufficiently satisfy the assumptions of normality—conditions that make non-parametric rank-based tests an appropriate analytical choice in small and medium-sized applied research—this decision seems to be consistent with the

features of the data in the current study (Garrocho-Rangel et al., 2024).

4. RESULTS AND DISCUSSIONS

The results in Table (1) show that as cognitive load increased, the processing failure rate in delayed selection tasks increased in both the auditory and visual groups. Before achieving 100% at 900 stimuli, the failure rate for auditory

learners was 13.81% at 225 stimuli, 5.87% at 400 stimuli, and 8.93% at 625 stimuli. The failure rate for visual learners was 4.71% at 225 stimuli, 7.85% at 400 stimuli, 8.92% at 625 stimuli, and 100% at 900 stimuli. These findings unequivocally show that both groups' capacity to recognize the target stimulus broke down as a consequence of the increased cognitive load.

Table (1) shows the percentage of processing failure (inability to select the target stimulant) during late selection tasks, based on the early selection of the two study groups across different levels of perceptual load.

Representation system	No.	225 stimulant	400 stimulant	625 stimulant	900 stimulant
Auditory	16	13.81 %	5.87%	8.93%	100%
Visual	14	4.71%	7.85%	8.92%	100%
Percentage of processing failure		265.76%	6.86%	3.93%	100%

This finding shows that the demands on scanning and perception increased to a level greater than the available processing capacity due to the notable increase in input density within the visual field. This is consistent with current findings that visual search tasks are harder as the number of distractions rises and the perceptual scene's structure gets more intricate. Furthermore, recent studies on attention in athletes and non-athletes have shown that the speed and accuracy of target detection are directly affected by the number of distractions and the degree of competition between them and the relevant stimulus. Higher visual complexity is reflected in slower response times and an increased likelihood of selection failure (Imperiali et al., 2025; Lauro et al., 2026).

The data in Table (2), using the Kruskal–Wallis test, showed no statistically significant differences between auditory and visual learners in performance time during early selective attention tasks at all four levels of perceptual load. The value of $X^2 = 0.801$ with 225 stimuli and a significance level of 0.371, $X^2 = 0.004$ with 400 stimuli and a significance level of 0.950, $X^2 = 0.301$ with 625 stimuli and a significance level of 0.583, and $X^2 = 0.163$ with 900 stimuli and a significance level of 0.687. These results indicate that the information representation pattern was not a significant factor in response speed during the early stages of attentional processing.

Table (2) displays the value of x^2 as determined by the Kruskal-Wallis test, which assesses the mean grade level of performance time in manual processing. The early selective attention of the two groups of study spanned perceptual load levels.

perceptual load levels	Participants in the study		Grade averages	Value of X^2	Degree of freedom	Significance
	System	No				
First level 225 stimulant	Auditory	14	88.57	0.801	1	0.371
	Visual	16	35.52			
Second level 400 stimulant	Auditory	14	26.54	0.004	1	0.950
	Visual	16	65.54			
Third level 625 stimulant	Auditory	14	57.56	0.301	1	0.583
	Visual	16	18.53			

Fourth level 900 stimulant	Auditory	14	98.52	0.163	1	0.687
	Visual	16	47.55			

Interpreting this pattern, it may suggest that early stimuli processing was primarily governed by the characteristics of the task itself and the level of visual competition, rather than by differences between auditory and visual representational systems. This interpretation is consistent with recent research that indicates some aspects of initial attention in sports, especially in laboratory or computer-based tasks, measure common basic processes that do not always show obvious differences between individuals or groups until the task demands become more complex or interfere with decision-making and execution processes. Furthermore, modern models of perception in football indicate that attention in the initial phase is often directed towards the positioning of the ball, teammates, opponents, and motor-spatial cues before individual

differences differentiate themselves in a more advanced stage of processing (Habekost et al., 2024; Plakias & Karakitsiou, 2024).

As shown in Table (4), regarding the number of errors in performing early selective attention tasks, there were no statistically significant differences between the auditory and visual systems at any level of cognitive load. The X^2 values were 144.2 at level 1 ($p < 0.00$), 479.2 at level 2 ($p < 0.00$), 011.0 at level 3 ($p < 0.00$), and 166.0 at level 4 ($p < 0.00$), all of which were not statistically significant, as indicated in the table. Therefore, the results of the early selection tables confirm the absence of significant differences between the two systems, either in performance time or in the number of errors.

Table (3) shows the values of x^2 according to the Kruskal - Wallis test for the level of significance of the differences between the mean scores of the number of errors in performance on the tasks of early selective attention participants in the study. Levels of perceptual load: Participants in the study.

perceptual load levels	Participants in the study		Grade averages	Value of X^2	Degree of freedom	Significance
	System	No				
First level 225 stimulant	Auditory	14	65.49	144.2	1	143.0
	Visual	16	58.57			
Second level 400 stimulant	Auditory	14	20.49	479.2	1	115.0
	Visual	16	87.57			
Third level 625 stimulant	Auditory	14	83.54	011.0	1	917.0
	Visual	16	29.54			
Fourth level 900 stimulant	Auditory	14	87.55	166.0	1	917.0
	Visual	16	63.53			

This finding supports the hypothesis that the early stimulus selection phase in this study was more of a primary perceptual response to the crowded visual scene, such that the auditory or visual representational pattern was insufficient to produce substantial differences in accuracy. This interpretation is further supported by recent studies confirming that some attentional differences only become apparent in tasks

requiring the integration of perception, response control, and sustained focus, while initial indicators of attention may remain relatively similar between individuals on basic or short-term tasks (Imperiali et al., 2025; Lauro et al., 2026).

Table (4) shows statistically significant differences between the auditory and visual

systems in performance time during delayed selective attention tasks at only two levels of cognitive load. The value of $X^2 = 813.53$ was recorded at the first level (225 stimuli) at a significance level of 0.001, and at the fourth level (900 stimuli) at a significance level of 0.019. In both cases, the differences favored those with a more auditory system, who achieved a shorter response time than those with a more visual

system. However, at the second and third levels (400 and 625 stimuli), the differences did not reach statistical significance. These results indicate that the auditory system's temporal advantage was not consistent across all conditions, but rather appeared at both the lower and higher ends of the cognitive load used in the analysis.

Table (4) shows the values of x^2 according to the Kruskal-Wallis test for the level of significance of the grade averages for the performance time on the tasks of selective attention of the two groups of study across perceptual load levels of perceptual load participants in the study.

Perceptual load levels	Participant in the study		Grade Average	Value of (x^2)	Degree of freedom	significant
	system	No.				
First level 225 stimulants	auditory	14	26.79	813.53	1	**0.001
	visual	16	14.72			
Second level 400 stimulants	auditory	14	39.48	613.2	1	0.106
	visual	16	39.58			
Third level 625 stimulants	auditory	16	48.58	453.2	1	0.117
	visual	14	27.58			
Fourth level 900 stimulant	auditory	16	45.62	562.5	1	*0.019
	visual	14	15.60			

This finding suggests that the effect of the information representation system is more pronounced in delayed processing than in early processing, i.e., in situations requiring a relatively longer selection time or a higher degree of decision organization. Recent literature supports this trend, indicating that response time is a sensitive indicator of differences in cognitive competence between individuals, and that athletes or those with higher cognitive competence may exhibit a temporal advantage even when no corresponding differences are observed in some accuracy tests. A recent study in a virtual reality environment also demonstrated that athletes clearly outperformed temporal response indicators, and that these indicators may be more discriminatory than some other visual

attention tests (Imperiali et al., 2025; Lauro et al., 2026).

The data in Table 5 revealed statistically significant differences between the auditory and visual systems in the number of errors at two levels of cognitive load. At the first level (225 stimuli), $X^2 = 77.18$ at a significance level of 0.001, and at the fourth level (900 stimuli), $X^2 = 35.18$ at a significance level of 0.001. The differences at both levels favored auditory learners, who made fewer errors compared to visual learners.

There were no significant differences between the second and third levels. This finding suggests that the auditory system's better performance in delayed attention tasks extends beyond speed to accuracy and error reduction.

Table (5) shows the values of χ^2 according to the Kruskal-Wallis test to signify the grade averages for the number of errors in performance on the tasks of selective attention of the two groups of study across perceptual load levels of:

Perceptual load levels	Participants in the study		Grade averages	Value of χ^2	Degree of freedom	Significance
	system	No				
First level 225 stimulant	auditory	14	38.52	77.18	1	001.0**
	visual	16	67.64			
Second level 400 stimulant	auditory	14	05.57	475.0	1	491.0
	visual	16	88.52			
Third level 625 stimulant	auditory	14	64.49	760.1	1	185.0
	visual	16	59.57			
Fourth level 900 stimulant	auditory	14	54.38	35.18	1	001.0**
	visual	16	66.64			

This pattern is explanatory because the correlation between faster response and fewer errors suggests that the superiority was not due to a mechanical acceleration of the response at the expense of accuracy, but rather reflects greater efficiency in allocating attentional resources and managing competing stimuli at certain workload levels. This outcome is consistent with other evaluations that demonstrate that performance in team sports, such as football, is impacted not just by physical characteristics but also by the ability to filter relevant information and disregard irrelevant information while under temporal and cognitive pressure. Modern football literature also confirms that neuropsychological and physiological factors interfere with technical and tactical performance, and that improving performance requires an integration of physical, cognitive and attentional training (Plakias & Karakitsiou, 2024; Habekost et al., 2024).

5. CONCLUSIONS

The study's findings show that a key component of young football coaches' attentional processing effectiveness is cognitive load. Performance significantly declined as the amount of distracting visual stimuli increased; at 900 stimuli, both the visual and auditory groups exhibited total processing failure. This implies that when cognitive capacity is surpassed, the ability to quickly and accurately choose the target stimuli is

hampered. Additionally, the findings demonstrated that neither the performance time nor the number of mistakes in early selective attention tasks were statistically significantly affected by the information representation system. This implies that the task's nature and the level of visual rivalry had a greater impact on this processing step than variations in the coaches' approaches to information representation. However, tasks requiring delayed selective attention had a stronger impact on the representational system. At levels one and four of cognitive load, those with an auditory system performed faster and more accurately than those with a visual system. This suggests that individual differences related to information representation styles may become more apparent when a task demands greater levels of attentional organization and decision-making under increasing cognitive load. As a result, there may be an interaction between cognitive load and attention that is impacted by the task's complexity, the processing stage, and the person's cognitive traits rather than a straightforward linear relationship. These results are thus useful for both teaching coaches and training scenarios that call for efficient attentional control in stimuli-rich contexts.

To confirm the validity and generalizability of these findings, future studies should try to increase the sample size and diversity to include

coaches from other age groups, experience levels, and sports. Furthermore, since these tools offer more realistic conditions for measuring selective attention and decision-making in dynamic sporting contexts, it will be crucial to repeat the study using more contemporary tools like virtual reality environments, eye-tracking, and video tasks that more closely resemble real-world playing situations. It's also critical to look at other elements that may influence cognitive load, such as coaching experience, mental exhaustion, cognitive flexibility, working memory, and sport style. It should also be looked into if cognitive training programs can be developed to speed up selection and reduce errors made by coaches and players. Additionally, it is recommended that future research distinguish clearly between early and late periods of attention during analysis and refrain from using a single performance score.

Rather, it must to include indicators of attentional stability, mistake count, response time, and, if feasible, neurophysiological markers. To ascertain whether the relative advantage demonstrated by the auditory system in specific laboratory tasks translates to improved decision-making and technical guidance during training and competition, the relationship between information representation systems and actual on-field performance could also be investigated. Therefore, future research can support current trends that highlight the significance of integrating physical, cognitive, and attentional training in developing athletic competence by creating a more integrated model that links cognitive load, the coach's cognitive characteristics, and the demands of realistic athletic performance.

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