

# Comparing and Contrasting the Perceptions of Strength and Conditioning Coaches towards Within-Role Decision-Making Processes

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## Abstract

Building from recent studies on cognitive and meta-cognitive skills in experienced and early career Strength and Conditioning Coaches (SCCs), the current study employed a focus group methodology to compare and contrast these earlier findings. Focus groups ( $n = 8$ ), reflecting the opinions of 29 participants, were conducted with purposefully recruited international groups of experienced high-performance SCCs. Participants considered two previously developed models, reflected on the associated themes, and these were then defined or combined. Within this process, the data also yielded new themes. Reflexive thematic analysis generated five themes surrounding the decision-making process of SCCs and the design of training programs: input from environmental lead, observe the athlete(s) with the head coach, connect with the athlete(s), integrate with others and consider logistics. Moreover, context, collaboration and communication were identified as providing depth and breadth to the perceived impact possible at each stage. With consideration of managing difficult situations within Strength and Conditioning domains, three themes were generated as being most impactful on SCCs' decision-making: situational awareness, improvisation and metacognition. We discuss the fit of these results with earlier studies, together with the implications for training and accreditation of SCCs.

## Keywords

Context, Situational Awareness, Metacognition, Improvisation, Decision-Making, Coach Development, Learning

## 1. Introduction

Helping athletes excel at their specific sport has been identified as the priority of

strength and conditioning coaches (SCCs; LaPlaca & Schempp, 2020). There is a growing body of research in the field of strength and conditioning (S & C) directed towards identifying the behavioural, knowledge-related and psycho-social characteristics of SCCs with different levels of experience. Much of this research has been achieved by focusing on perceptions of SCCs and athletes, using both semi-structured interviews (Szedlak et al., 2015; Szedlak et al., 2021) and surveys (LaPlaca & Schempp, 2020). Importantly, however, while this research is valuable in developing a better understanding of what, how and whom to coach in S&C environments, there remains a paucity of investigations concerning the decision-making characteristics and processes of SCCs. Engagement by coaches in more thorough and considered decision-making processes has been encouraged as it supports both the coach and athlete to clarify expectations (Abraham et al., 2014).

Common preparation methods of candidates for S & C roles are via accreditation processes and classroom based courses at undergraduate and postgraduate level (Bishop et al., 2019). As highlighted by Murray et al. (2014), formal classroom settings have been frequently criticised for their limitations in preparing pre professionals for real-life obstacles. Students are often oblivious to within role tasks including planning, interactions with coaches and adjustments associated with each context experienced. These examples are in addition to the range of complex decisions that SCCs are required to make daily about the health and wellbeing of their athletes (Meir & Nicholls, 2018). It is therefore clear that for SCCs to successfully deliver quality outcomes, they require the ability to make decisions confidently and accurately across all aspects of their role. Despite this, there remains a paucity of investigations concerning the decision-making characteristics and processes of SCCs.

Recently however, with specific reference to SCCs, a model has been offered (Till et al., 2019), which focuses on the domains of who, what, how, planning-delivery-review (PDR), the concept of self and, finally, social, cultural and political considerations. Although this framework has made a positive contribution to S & C, there is a need to both acknowledge the “why” within SCC’s decision-making as well as provide some empirical evidence to support presented frameworks so that they can be applied with a greater degree of confidence.

One method that has been used to identify the cognitive skills needed to perform tasks proficiently is the Applied Cognitive Task Analysis (ACTA; Militello & Hutton, 1998). Such ACTA interviews have been carried out with both high-level coaches (HLCs; Downes & Collins, 2021a) and early career coaches (ECCs; Downes & Collins, 2021b) within the S & C domain. The findings of these studies demonstrate commonality across HLC’s decision-making regarding training program design and the cognitive strategies used to navigate difficult elements of their role. These included a shared mental model seemingly born of reflection on practice, albeit individually rather than centrally encouraged or facilitated. In contrast, ECCs demonstrated a more basic approach, with their decision-making focused on less complex and straightforward goals. Tod et al. (2012) stated that understanding the attributes of effective SCCs could help inexperienced practi-

tioners to identify the characteristics they need to develop in themselves. Whilst there is existing research identifying the effective coaching behaviours of experienced SCCs (LaPlaca & Schempp, 2020; Gillham et al., 2016; Tod et al., 2012; Szedlak et al., 2015) less is known about the characteristics of less experienced SCCs (Carson et al., 2021; Laplaca & Schempp, 2020). Research within S & C has highlighted the importance of interpersonal skills (Szedlak et al., 2021; Szedlak et al., 2019) with increased skills reported to distinguish between expert and competent SCCs (LaPlaca & Schempp, 2020).

Experienced SCCs occupying roles such as program directors, editorial board members or department supervisors (Gearity et al., 2021), are often involved in the design and delivery of tertiary education and accreditation content. Gaining insights from personnel such as these into the current demands of S & C roles can assist in more relevant content being delivered. The aims of the current research were to generate deeper insights regarding previously reported findings (Downes & Collins, 2021a; Downes & Collins, 2021b) on the decision-making processes of SCCs. This was with regards to training program design as well as exploring wider aspects of a SCC's role. A deeper exploration of the "why" that underpins experienced SCCs' decision-making would make a valuable contribution to the S & C domain. Through accessing more diverse opinions on specific aspects of the S & C domain and the cognitive strategies implemented by experienced SCCs, the intention was to discover new information and improve the understanding of strategies used to navigate within-role situations.

## 2. Methods

### 2.1. Participants

Following approval from the Institutional Review Board, a criteria-based, purposeful sampling strategy (Sparkes & Smith, 2014) was used to invite SCCs for participating in focus groups. A focus group is a research technique to collect data through group interaction on a topic determined by the researcher (Plummer-D'Amato, 2008). This technique enables investigators to access participants' views of a specific topic. Investigations can then draw from the complex personal experiences, beliefs, perception, and attitudes of participants through moderated interactions (Kitzinger, 1994). Participant identification is considered as perhaps the most critical step for a focus group, since the technique is largely based on group dynamics and synergistic relationships among participants (Kitzinger, 1994).

Previous research highlights that willingness to fully engage in a group discussion is instrumental in generating useful data and can be achieved more readily within a homogenous group (Krueger, 1994). Consequently, Krueger (1994) suggests that participants should share similar characteristics, such as gender, age range, ethnic and social background, as well as demonstrate a homogeneity of SSC background, training, experience, and role. In accordance with these recommendations, the primary researcher initially used their professional networks to identify and contact experienced SCCs. Information was emailed regarding the purpose of study and the required criteria for participants to be included. To

be deemed eligible SCCs were required to have at least 5 years of S & C coaching experience in a full-time environment. Potential participants then received an invitation letter and a further information sheet about the study through email. Discussions (email, video call or audio call) were conducted as required to provide any additional information regarding the intentions of the research and their potential involvement.

The participant summary for each focus group is demonstrated in **Table 1**. Experienced opinions were then obtained from SCC participants operating with male and female as well as able-bodied and disabled athletes. The athletes coached by the participants encompassed elite and developmental athletes who had competed in team and individual sports. Information regarding depth and breadth of experiences was sought to provide a high degree of ecological validity and application of findings and recommendations.

## 2.2. Data Collection Procedure

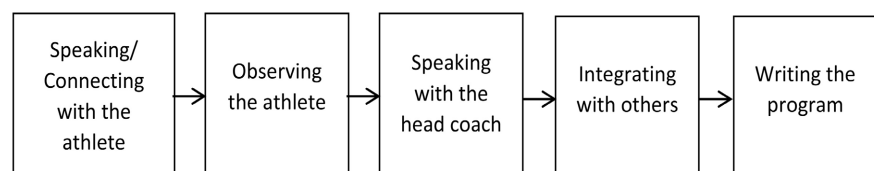
For each focus group, a primary contact was identified who advised the first author regarding the preferred environment for the focus group to take place. This not only added to convenience for SCC participants but also allowed them to feel relaxed and comfortable during the interview. To provide consistency of

**Table 1.** Socio-demographic and work experience characteristics of *focus group participants*.

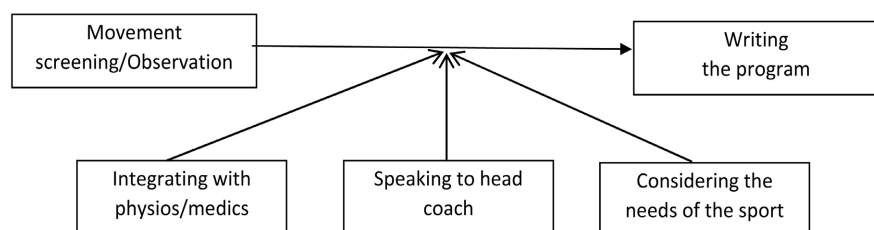
Number of Coaches	29
Age of Coaches	36.4 ± 4.2 years
Years Coaching	11.8 ± 4.0 years
Sports Coached at Elite Level (International/Professional)	Adventure Racing, AFL, Athletics, Badminton, Basketball, Bob Skeleton, Bobsleigh, Boxing, Climbing, Cricket, Cycling, Cyclocross, Equestrian, GAA Camogie, GAA Gaelic Football, GAA Hurling, Golf, Handball, Hockey, Ice Hockey, Judo, Military, Motocross, Mountain Bike, Netball, Para Equestrian, Para Sailing, Road Cycling, Rowing, Rugby League, Rugby Union, Soccer, Sport Climbing, Squash, Swimming, Track Cycling, Trampoline, Tennis, Volleyball, Wheelchair Basketball, Wheelchair Rugby, Wheelchair Tennis
Sports Coached at Non-Elite Level	American Football, Archery, Athletics, Badminton, Basketball, BMX, Canoe Polo, Cricket, Curling, Cycling, Deaf Soccer, Equestrian, Fell Running, Field Hockey, Golf, Hockey, Ice Hockey, Judo, Korfbal, Lacrosse, Netball, Para Cycling, Para Swimming, Powerlifting, Rowing, Rugby League, Rugby Union, Sailing, Skiing, Soccer, Swimming, Table Tennis, Tennis, Ten Pin Bowling, Triathlon, Ultimate Frisbee, Weightlifting, Wrestling

setting among focus groups, environmental notes were circulated prior to meeting. These included recommendations about having a do-not-disturb sign on the meeting room door and ensuring availability of comfortable seats.

To ensure confidentiality, participants were told that data would not be attributed to them and that names mentioned during the interview process would be omitted from the transcribed data. Interviews began with some general questions to develop rapport and familiarise participants with the format of the discussion. Following this, groups were asked to comment about the initial priorities/findings on the HLC decision-making process shown in **Figure 1** (Downes & Collins, 2021a). The purpose of this discussion was to establish the level of agreement and disagreement with the findings and identify any considerations respondents perceived to be missing and, if so, why. The same process was followed for the data regarding ECCs (Downes & Collins, 2021b; see **Figure 2**). This was followed by a discussion that explored a summary of the Knowledge Audit data presented on HLCs to determine levels of agreement and disagreement as well as to again seek for opinions on any characteristics that might have eluded the ACTA process. Finally, there was a discussion around the strategies of ECCs concerning aspects of decision-making within their role, with solutions discussed on how to develop the perceived cognitive strategies required to be effective as a SCC. Importantly, to increase the trustworthiness of the data, time was spent at the conclusion of each focus group to check for understanding by summarising the main themes that the first author had interpreted during the group. Participants were asked to respond if the summary statements were valid and to add anything further; this ensured that the participants' opinions had been fairly captured. It is important to note that none of the participants in the present study were involved in the previous research discussed in the focus groups.



**Figure 1.** Task diagram illustrating the stages associated with the HLC decision-making process when designing training programs.



**Figure 2.** Task diagram representing the key stages for early career coaches in making decisions with regard to training program construction.

### 2.3. Analysis

The present study was underpinned by interpretivism, namely, ontological relativism and epistemological constructivism, which proposes that knowledge is constructed and subjective. Data gathered through the focus groups displayed both naturalistic generalisability and transferability of results. Focus groups invited transferability through gathering direct testimony, providing rich description, and writing accessibly and invitationally (Tracy, 2010). Participants in the present study were SCCs who were able to reflect on and share a breadth and depth of experiences within S & C contexts (Table 1) at both developmental and elite levels of sport enhancing the transferability of the findings generated (Tracy, 2010). The richness of responses permits other SCCs to engage in the findings and recognise the concepts and examples discussed in relation to their own experiences (Smith, 2018; Smith & McGannon, 2018). The topic satisfies the criteria of being relevant, timely and significant by extending on recent investigations into the decision-making process of SCCs (Downes & Collins, 2021a; Downes & Collins, 2021b) and advocating the use of constructivist approaches within S & C development (Szedlak et al., 2021; Gearity et al., 2021). Examination of the findings should provide stimulus for coach development strategies within S & C.

A rigorous reflexive thematic analysis was applied to the qualitative data set, following the six-phase procedure outlined by Clarke et al. (2019). The six phases have been described as: 1) familiarisation with the data and identifying items of potential interest, 2) generating initial code, 3) constructing themes, 4) reviewing potential themes, 5) defining and naming themes and 6) produce the report (Braun & Clarke, 2021). Thematic analysis was selected as it does not contain methodological stipulations, nor is it tied to a specific theoretical framework or approach, thus allowing researchers flexibility in analyzing the data and been popularly applied to focus groups (Braun et al., 2016; Braun et al., 2019). This approach has previously been described as offering flexibility around data collection and has been popularly applied to focus groups (Braun et al., 2019). The process identifies new patterns of meaning which can help to determine whether the information generated by participants offers something new or not (Braun et al., 2019), thereby extending upon published research regarding the decision-making processes of SCCs.

It is worth further considering the coding process, as a source of perhaps unavoidable subjectivity. Braun et al. (2019) explained that there can be both an inductive and deductive orientation to coding. Within the present study, the deductive analysis was shaped by the intention to test previously collected and reported ACTA findings (including Figure 1 and Figure 2). An example of the deductive code development was the generation of “observe the athlete with the head coach” through a combination of “observing the athlete” and “speaking with the head coach” as identified and discussed within Figure 1 and Figure 2. Extending on this, an inductive analysis process to examine broader questions

about the data was conducted and codes and themes were generated from the data content.

The first author performed all coding and initial theme development. The construction of themes was an active process with checks conducted to ascertain if they worked in relation to coded extracts and the entire data set. As part of checking and gaining wider insights into the data, the second author acted as a critical friend. The role of the critical friend is “not to ‘agree’ or achieve consensus but rather to encourage reflexivity by challenging each others’ construction of knowledge” (Cowan & Taylor, 2016: p. 508). In this study the second author provided encouragement to reflect upon and explore alternative interpretations as these emerged in relation to the data and writing. The intention of author discussions was not to produce any “consensus,” but rather to gain greater initial insight through sharing each other’s perspective on the data. Fitting with good practice the second author also independently reviewed three of the eight focus group data. Within the results, data extracts are used as exemplars of the data found within themes and analytically discussed in more detail.

### 3. Results

The analyzed focus group data are presented in three sections. The first section identifies the level of agreement held towards **Figure 1** and **Figure 2**. These figures concern the recalled decision-making processes of HLCs and ECCs, respectively, when designing training programs. Second, additional factors concerning the aforementioned process were identified and considered by the focus groups. Finally, a summary of the difficult cognitive situations, for example managing oneself within the training environment and responding to unexpected changes to training environment, are provided to demonstrate significant influences on experienced SCCs when operating in their environment. An example being responding to unexpected changes in the training environment or managing oneself within these environments. Analysis of discussions identified situational awareness; improvisation and metacognition as influential skills required by SCC’s to navigate difficult situations.

#### 3.1. Expanding on the Training Program Design Process

Participants had agreement with the stages proposed previously in **Figure 1**, which deal with HLC decision-making when considering training program design. There was similar agreement and understanding with the two-stage approach for ECC decision-making in relation to program design (**Figure 2**). From exploratory discussions, each stage was elaborated upon with regard to secondary themes. In addition, two more primary themes were generated that participants considered relevant to the training design process: “input from environmental lead” and “consider logistics”. Moreover, the original “observing the athlete(s)” stage was reconsidered to become “observing the athlete(s) with the head coach” (**Table 2**). Participants consistently referred to decision makers and influencers holding roles superior to the head coach. When reflecting on national

**Table 2.** Primary and secondary themes from focus group surrounding decision-making process for initial training program.

Primary Themes	Sub Themes	Influenced By
<b>Connect with the athlete(s)</b>	motives	
	background	
	learning style	
	language	
<b>Observe the athlete(s) *with the head coach</b>	in competition	
	in training (the sport)	
	in training (S & C)	
	in testing/screening	
	socially	Type of sport (team/individual) Level of sport (elite/development)
<b>Integrate with others</b>	past technical coaches	Degree of collaboration
	past SCCs	experience level of SCC (HLC/ECC)
	social influences	Degree of communication Appreciation of context
	language	
	expectations	
<b>Input from environmental lead</b>	identity of organisation	
	philosophy(ies)	
	role of S & C	
<b>Logistics</b>	what can be done	
	why/why not to be done	
	how to be done	
	where to be done	
	when to be done	

institution environments an example would be a program director and examples from team sport environments include general managers and or sporting directors. These persons were coded as “environmental leads”.

During focus group discussions, participants consistently referred to their current and previous experiences, ascertaining the role of S & C within an organisation and clarifying the purpose of the role SCCs had within the decision-making processes for training program design. One participant described their considerations for gaining input from an environmental lead as follows:

What’s the coach’s philosophy, what’s the team’s philosophy, what’s the club’s overall structure and where do you (the SCC) fit in? Have they had S & C before, [and] was it well accepted? So [as a coach] you are getting a feel

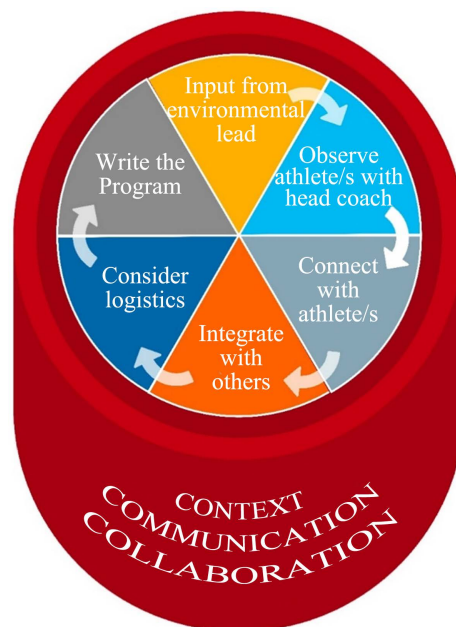


for when you go in what are you going to face; you know are you in a situation where these athletes have done S & C [and] do they love S & C [,] and you are just taking it [to] next level. Or are you in a situation where it has never been done before and it's going to be completely new?

Taking these variables into account, participants agreed that contextual appreciation was elevated, future aspects of decision-making would be more aligned across departments and communication and collaboration would be more effective.

Deeper conversations into the training program design process highlighted the need to consider logistics and the impact its inclusion, as well as its exclusion, can have on the success of any program delivered. According to one participant, an example of logistical considerations was the size of a training group: “[While] organising a larger group of athletes within a confined space, the logistics of that has to somehow drive your ability to program”. The participant was describing how through a constraints-based approach, by not including group size in their decision-making, they may develop an ineffective program through mismanaging the sessions due to poor within-session flow and/or too little equipment.

Discussions surrounding role requirements and thinking tasks that extended beyond typical S & C theory manipulation and session delivery were prevalent in focus groups and contributed to the inclusion of logistics in the overall reconsidered process model (see **Figure 3**). With reference to **Figure 3**, it is important to acknowledge the revision of “observing the athlete(s)” to “observing athlete(s) with the head coach”. Participants emphasized the value of a strong relationship with coaching staff.



**Figure 3.** Operationalised model of decision-making to help strength and conditioning coaches to enhance the training program design process.

I think, in this environment, one of the first things I thought about doing was just observing them with their technical coach in practice rather than worrying about assessing them straight away off the back, so spent a lot of time with coach, observing on court practice. First and foremost, it gives you what the coach is looking for in the athlete, so what are they asking the athlete to do, to do well and do repeatedly, because then that can obviously influence your practices as a[n] S & C coach and, maybe, not only the demands of the game but [also] the demands of the coach and their style within that game.

This explanation alludes to the benefits of heightened contextual appreciation and improved collaborative processes that are achieved through investing time in operating and conversing with the head coach and other technical coaches.

### **3.2. The Role of Context, Communication and Collaboration**

Analysis of the focus group data on the previous decision-making processes of designing training programs for HLCs and ECCs offered five stages of consideration. These followed a logical order, since each one impacts the effectiveness of the next. These five stages, and their sequence, are illustrated in **Figure 3**. Discussions revealed that SCCs perceived each of these stages as plausible and recommended them for both ECCs and HLCs. Current findings indicate the depth of engagement and effective execution of each stage by SCCs would be influenced by their awareness of context, the quality of communication, and the investment in collaboration.

In discussions orientated towards the successful, or unsuccessful, execution of the decision-making processes of training program design, participants used examples of how ECCs have been observed to behave. A participant highlighted the role of experience on contextual appreciation as follows: “The ability of young coaches to understand context I think is influenced by how much exposure have they had to people across different spectrums of lie, different ages, different stages and experience”.

Participants acknowledged the impact of coaching across a range of contexts on future awareness. Indeed, these embedded experiences were perceived to also relate to the communication skills of SCCs. Contextual factors prominent in discussions were the level of sport in consideration (elite or developmental), the type of sport (team or individual) and the experience level of the SCC in question (ECC or HLC; see **Table 2**). Participants explained that communication was a key skill in their role, and according to a participant, an absence of experience creates a threshold in ECCs:

With early career coaches that I’ve seen, they might have some communication skills that are good that can get them to a certain point in delivering sessions. But it’s the ability to understand it that needs to be delivered in different contexts to different populations and even to different athletes within a sport.

Analysis of responses identified causal factors for the approaches taken by ECCs as occurring due to a combination of the nature of their educational preparation and previous coaching experiences. The latter were described as likely to be shaped by personal training or working with student athlete populations. When discussing ECCs and the experiences they accumulate at university, participants were consistent in differences they perceived in the orientation of those ECCs whose further education had a coaching orientation and those whose learning was focused on sports science research. The common views are represented in the thoughts of a participant who stated,

I see a massive difference in the ability to coach and to teach, to communicate effectively and have confidence in being in front of the group. The coaching ones [students] are really good, but they maybe don't have the underlying scientific knowledge, but they kind of intuitively know how to get things going... yeah I've had some absolutely first-class students come out, and they are really good at building acute chronic work their databases. But they can't have a chat with the coach, and so and I think, I think of balance between the two is really good, but yeah I definitely think there's a bit of shaping that goes on depending on the weight in; this if you're coming from a coaching-dominant domain even if it's not sport science and then you're coming from a, in a sports science you definitely see a difference in probably what they see is important and then which avenue they go down.

Discussions regarding the impact of these perceptions on subsequent coach development and coach preparation for careers in S & C were orientated towards the suggested inclusion of genuine coaching experiences to examine and, specifically, generate athlete and coach interactions. Importantly, although there was an agreement that the four stages included in the HLC decision-making process should remain the same in any operationalised model, yielded data demonstrated that **Figure 1** was incomplete. Stages were not necessarily in the appropriate order if seeking to provide guidance to SCCs on their decision-making in terms of context, communication and collaboration working together and adding depth to the decision-making process of training program design. In this regard, a participant stated,

Ideally you would have a good framework of what the sport is requiring in the first place. This way you've got a bit of background knowledge when the athlete comes in to see you to try and match those bits up. Because if the athlete's got this idea but it's actually totally different to what the sport is after from them in terms of trying to speak to them, and the head coach, there will be confusion about where they [the athlete] should actually head. Sometimes, the athlete is the best person to give you information and sometimes they're the worst.

In this example, a SCC is supposed to have a greater understanding of the big

picture, which is facilitated by means of input from the environmental lead so as to understand the framework. This contextual understanding is alluded to being supported through communication and collaboration prior to connecting with the athlete, thereby improving subsequent collaboration and communication when connecting with the athlete. This working example, together with the inclusion of the final suggested stages of integrating with others and considering logistics, is shown in **Figure 3**.

### **3.3. Managing Difficult Situations**

As part of the focus groups, discussions were held to ascertain the level of agreement and disagreement towards previously reported strategies and cues that HLCs and ECCs utilised to manage difficult situations. Findings demonstrated situational awareness, improvisation, and metacognition to be impactful on S & C performances. Moreover, the ability of SCCs to be effective across contexts was prevalent as a topic among participants. Participants had a high level of experience in different contexts, and when reflecting on the current state of the S & C domain, one participant explained,

I think we're losing the ability to notice. What young, inexperienced coaches think is important—that's all they will notice; they will naturally focus in on what's the good score, what was the technique—very simple metrics—and miss the whole thing that's going on in the session.

These perceptions highlighted the participants' opinion that ECCs are perceived to be metrically orientated in their decision-making and rule bound to coaching framework rather than being able to adapt and demonstrate agile thinking based on the context. The notion of adaptability, and indeed improvisation, was a skill that participants distinguished to be of high value in SCCs' role; however, it was agreed as being poorly utilised by ECCs.

Discussion was orientated towards ECCs reducing the complexity of a task and situations to reduce the degree of variability within their environment, leading to fewer, more stable decisions. This approach was perceived to be for the benefit of SCCs and their level of confidence and competence rather than the most effective approach for the athletes. Regarding SCC confidence and improvisation, the opinion of the participants was well summarised in the following statement:

Underpinning improvisation for me is a lack of experience to be confident in making decisions to deliver an outcome. As an early coach, the outcome's what I'm after. I'm not after the modality or the stage setup; that can all be manipulated because the outcome is what I'm actually looking to achieve. I think improvisation is something that comes with experience and having confidence in yourself to be able to make that decision.

Deeper level of thinking by SCCs, including consideration of the impact variables within an environment, affects the outcome of decisions made and was

regarded as another highly valued skill in the field of S & C. Participants referred to previous and current experiences to outline the impact that metacognitive processes can have within their role. Within focus group discussions, metacognitive abilities were consistently considered influential for all aspects of the coaching process. Indeed, metacognitive processes were described as effective at elevating SCCs' levels of situational awareness and improvisation within a coaching session. Importantly, when acquisition and development of metacognition were discussed, the role of experience was prominent. Such opinions were exemplified in the summary by one participant: "The only thing that I think evolves as you become more experienced as a S & C coach in your sport or [when you are] moving across sports is you've become more efficient in your thinking and processes".

The statement also indicated that experience plays a big part in a SCC acquiring and developing heightened levels of proficiency in their strategies. Participants suggested employing higher levels of metacognition, be it consciously or unconsciously, to acknowledge the what, why and how of a context permits SCCs thereby increasing the range of possibilities considered when approaching and succeeding in difficult situations.

## 4. Discussion

The present study sought to establish the level of agreement and disagreement with previous findings regarding the decision-making processes of HLCs (Downes & Collins, 2021a) and ECCs (Downes & Collins, 2021b) within their roles, moreover, it aimed to identify anything that might have previously been omitted. Exploration of the decision-making processes of SSCs has, until recently, been sparse in the literature. Results support the benefits of focus groups described by Nyumba et al. (2018), who stated that this type of investigation provides an opportunity to explore issues that are not well understood and build on group dynamics to explore the issues in depth and detail. Within their role SCCs are required to perform a variety of tasks and possess a variety of skills. In a recent analysis of S & C job descriptions Vernau et al. (2021) reported that program design was the highest ranked skill required amongst essential criteria. The present findings support SCCs, and those responsible for designing coach development material, to better understand the decision-making processes of experienced SCCs within training program design and, importantly, other difficult aspects of their role.

### 4.1. Reconsidering the Training Program Design Process

Regarding training program design, current findings demonstrated a need to reconsider the language and extend the original task diagram (see **Figure 1**) to include improved awareness of the cognitive strategies implemented by SCCs of varying experience levels in relation to specific knowledge categories of expertise. As illustrated in **Figure 3**, the focus group approach generated two addi-

tional themes regarding the task diagram proposed in **Figure 1**. The inclusion of input from the environmental lead was perceived to affect the direction of SCCs' decisions. This agrees with **Till et al. (2019)** who included the dimension of "context, culture and politics" in their proposed decision-making framework for SCCs. Whilst a head coach is pivotal to a SCC's daily practices the vision, values, and overall direction, as directed from higher roles, of an organisation need to be considered. Participants included program directors and general managers within their examples. Also, **Gearity and Mills (2012)** previously stated that understanding the dynamics of power relationships and the subtle influences that dominant traditions have on the behaviour of athletes and the conduct of coaches may be useful in identifying and overcoming flawed approaches to S & C training. These are important factors for SCCs to consider as part of gaining a full understanding of the role that the S & C department has within an organisation and, in kind, what are the desired requirements of their role.

Earlier research identified the significant influence that planning was deemed to have on coaching performances (**Gallimore & Tharp, 2004**). Previously **Szedlak et al. (2015)** identified that planning includes logistical skills which agrees with present findings that included considering logistics as an important stage in program design. This stage requires SCCs to be well prepared if they are to effectively make decisions within their coaching context. Although our findings identified consideration of logistics to be an important skill to support the training program design process, previous literature in the S & C domain on planning has typically orientated towards the concept of periodisation (**Haff, 2016**). However, with **Vernau et al. (2021)** recently confirming the importance that employers place on the skill of program design, stimulus for SCC development to ensure logistical considerations become part of a SCC's holistic skill set.

When discussing communication in the context of explaining the what, why and how of SCCs' methods to coaches and athletes, the findings offered that communication of HLCs are more effectively developed to that of ECCs. This was attributed to their ability to tailor their language to the contextual factors presented. As such, coach development strategies are recommended to facilitate the development of ECCs' strategies regarding training program design and improve how they communicate complex matters. Clear and simple explanations to diverse populations is a characteristic of expert SCCs (**LaPlaca & Schempp, 2020**). Forms of communication that have been described to assist the formation of positive learning environments include facial expressions, gestures, positioning and posture (**Arthur-Kelly et al., 2003**). Specifically, concerning the S & C domain, **Holt (2016)** stated that pedagogical methods such as instructional technique, demonstration and questioning can be used but the success of any method will be influenced by the quality of the communication skill of the SCC. In addition, communication should not be constrained to an athletic performance focus and should also include psycho-social variables to consider the athlete as a person.

Recently it has been reported that HLCs include information about athletes on a personal level within their decision-making processes (Downes & Collins, 2021a), while Szedlak et al. (2015) reported that athletes perceive more effective SCCs to build relationships through developing trust, demonstrating high approachability, and displaying a sense of humour. We recommend that, in seeking to develop effective communication skills among SCCs, future learning strategies should be authentic and ideally situated in S & C environments to support the testing and refinement of communication skills. Such learning strategies would be indicative of a constructivist approach and supportive of recent S & C development literature (Gearity et al., 2021), advocating its suitability in developing the psycho-social skills needed for everyday S & C practice.

Figure 3 provides SCCs with an empirically supported model to facilitate effective program design through identification of stages perceived to be important by a range of experienced SCCs. The depth component illustrated in Figure 3 acknowledges the role of experience in operationalising the stages associated with program design. Although it is plausible that both HLCs and ECCs can be aware of the five stages in Figure 3, their ability to deliver efficiently and effectively in each of them will be influenced by the context, communication and collaboration.

## 4.2. Situational Awareness

Management of athletes in a team setting has been identified as a key coaching skill (Côté & Sedgwick, 2003). With specific reference to S & C, a differentiating characteristic of expert SCCs in comparison to competent SCCs has been reported to be their ability to manage a large group while also coaching athletes on an individual basis in this large group setting (LaPlaca & Schempp, 2020). Our findings suggest a SCC's level of situational awareness will influence their ability to manage difficult situations. This concurs with Till et al. (2019), who described that SCCs can only intervene within a training session if they notice the need to act in the first place. They offered that the ability to notice is reliant on coaches consciously attending to moments of importance or disruption. It is important that future preparation methods include opportunities to elevate a SCC's level of situational awareness. Scaffolding these opportunities by examining decisions made with an experienced other would benefit SCCs in better attuning their senses to the environment they are in, evaluating what they notice and making decisions. Another learning opportunity to develop situational awareness would be through coaching different populations with a low level of experience. Coaching such populations would rationally expose SCCs to a range of technical errors, making them selective in their use of coaching cues when dealing with athletes of low experience.

What SCCs interpret and improvise on is influenced by what they notice, and the present findings suggest that ECCs are drawn to stimuli associated with task completion against technical or metric markers within their contexts. As per the opinions of our participants, enhanced situational awareness will improve the

impact of SCCs in the workplace. One approach that has recently been investigated in S & C context is the use of vignettes. [Szedlak et al. \(2018\)](#) defined vignettes as a valuable way to initiate and extend discussions around an issue or story by means of introducing personal experience. Such an approach could be encouraging for ECCs who lack breadth and depth of delivery experiences and could help them consider approaches to situations that are yet to come as well as safely examine those that have already transpired. Finally, it is offered here that vignette- or scenario-based training be introduced as “real play” rather than “role play” to readily stress the importance of the engagement by SCCs if the rehearsals they perform are to have meaning transfer to their eventual delivery.

### 4.3. Improvisation

There is a dearth of literature surrounding improvisation and its role in coaching; however, [Falkheimer and Sandberg \(2018\)](#) have described strategic improvisation as combining the need for planning and structure with creative action and a normative idea of how to work in an efficient way. With direct reference to the delivery of S & C, this is where planning and execution occur simultaneously; consequently, thinking and doing have to occur in the moment. While negotiating a situation, it is difficult for SCCs, especially if low in experience, to consider all necessary aspects of delivery and environmental variables. The present study agreed with the previous findings ([Downes & Collins, 2021a](#)), that perceived ECCs’ decision-making to be dependent on metrically derived technical frameworks and outcomes. Such approaches are restricted to what is supposed to happen because of what is programmed rather than what is being done based on dynamic context that unfolds and can limit their effectiveness.

Improvisation also depends on awareness and, therefore, preparation of what could happen more strategically, directing a SCC’s listening and noticing within a session and promoting their ability to be present. Awareness of self as well as others will increase SCCs’ ability to be impactful in their decision-making. In other domains, such as education ([Lobman, 2002](#)), use of improvisational techniques has been investigated, but research in the field of S & C is still lacking. The present finding supports the need for SCCs to be able to innovate, think and adapt to changing contexts according to the knowledge and skills at their disposal. There is an opportunity for future research and coach development methods to incorporate improvisation, for example, via evolving situated learning content that requires SCCs to test different approaches to a particular problem.

### 4.4. Metacognition

Metacognition refers to awareness about one’s own thinking and was considered by [Flavell \(1979\)](#) to be the knowledge one has of their own cognitive processes. As evidenced in the present study, it is an important concept for SCCs and is utilised regularly by experienced SCCs. However, describing such processes as being metacognitive is not commonplace within S & C. This is likely due to the paucity of research regarding metacognition in this field and the lack of atten-



tion to decision-making within existing SCC preparation methods. Research in other domains, such as mathematics (Wilson & Clarke, 2004), has demonstrated that metacognitive thinking has an essential role in facilitating professional development and improving problem-solving processes and supports the present findings.

The present study is also in agreement with MacIntyre et al. (2014), who found that ability-related differences in metacognition exist. Further, in their review of the use of metacognition by proficient and poor performers in academic and psycho-motor tasks, Martini and Shore (2008) suggested that higher-level performers tend to use more planning strategies and monitor and evaluate their performance more accurately. In contrast, inexperienced performers tend not to plan, monitor or evaluate cognitive performance. These findings draw parallels with findings related to use of simplistic cognitive processes in difficult situations, as described by ECCs (Downes & Collins, 2021b), in comparison to use of metacognitive approaches discussed by the focus group participants and HLCs (Downes & Collins, 2021a).

Recently, Jeffreys (2020) highlighted the value for SCCs of pre-evaluating the range of factors that have the potential to derail a training program and developing strategies to mediate for these in advance. Jeffreys provided two questions as simple examples that could be used in this process to help stimulate thinking: what could go wrong to stop this intervention from working and what would need to be in place for this intervention to be most effective? These questions support Figure 3, which deals with considering context when designing programs and the role metacognition was perceived to have for SCCs to manage difficult situations. Examination of the educational psychology literature led us to Mahdavi (2014), who described three key components of metacognition: metacognitive knowledge (awareness of cognitive processes of self and others), metacognitive regulation (control over one's cognition), and metacognitive experiences (situational cognitive efforts).

Further, the importance of intra-personal as well as inter-personal skill development was highlighted by the current participants. Gearity et al. (2021) described a constructivist approach as suitable to developing these skills in SCCs through encouraging them to engage in interactive and reflective activities that foster active participation and learning in a collaborative environment. With recent findings (Downes & Collins, 2021a) being supported by the present study, S & C development material should focus on including contextual factors, communication, and collaboration tasks to enhance the awareness of the impact they can have on SCCs' effectiveness.

## 5. Practical Implications

Handcock and Cassidy (2014) concluded that those working with less experienced SCCs need to reflect on what, how, and why they are doing what they are doing if they are to support and nurture a heightened capacity of learners to

critically reflect on their practices and various within role contexts. The present study provided an opportunity for SCCs to engage in such reflection and critically discuss various within role processes. As a result, a much-needed contribution to the S & C domain has been made. The findings generated offer stimulus to discussions regarding how to develop strategies that will progress the decision-making skills required by SCCs within their role. Although [Grant and Dorgo \(2014\)](#) have previously stated that obtaining degrees and certifications is not enough to yield a successful professional career as a SCC, we contend that the application of the findings discussed could support more effective content for S & C learners.

An empirically supported model is offered to operationalise SCC's cognitions regarding training program design ([Figure 3](#)). The model is intended to assist SCCs to more readily navigate the common scenario of what to prescribe athletes but also how and, importantly, why. We suggest that concepts in [Figure 3](#) can logically be applied to numerous decision-making scenarios for SCCs beyond training program design. Recently, [Gearity et al. \(2021\)](#) offered recommendations to improve the education of SCCs within tertiary education and accreditation settings. The present study extends on these recommendations and offers insights into the direction of future interventions for ECCs' preparation within tertiary education and accreditation settings as well as SCCs' professional development.

Recent research has advocated a constructivist approach to SCC development ([Gearity et al., 2021; Szedlak et al., 2021](#)) and the present study supports this position. To successfully implement a constructivist approach, it is important for coach developers to consider learners' existing level of experience and knowledge possessed. This determination can positively influence the nature of content designed and the language used. The learners' adaptability can determine how receptive they are to alternative ways of thinking. This will also influence their ability to access previous knowledge and experiences. Consideration of context was important in the decision-making processes discussed by the participants. As part of a constructivist approach, inclusion of authentic, situated S & C experiences of varying diversity and complexity will facilitate the development of SCCs' situational awareness. This will support them to more readily know when, how and why/why not to intervene in different contexts. Previous experiences provide the resources for SCCs to interpret and make sense of new contexts. Delivery of content that is too unfamiliar or diverse from their current capacity limits how much a learner can notice and interpret. Therefore, in designing constructivist S & C approaches, we encourage progressive exposure to increasingly diverse and complex problems.

Understanding the attributes of effective SCCs helps inexperienced practitioners identify the characteristics they need to develop in themselves ([Tod et al., 2012](#)). Higher-level cognitive domains have been described by [Anderson & Krathwohl \(2001\)](#) to include creating, critical thinking and extended abstract thought. Specific to demands in S & C, present findings include metacognition, situation-

al awareness, and improvisation as stimulus for consideration by coach developers. Through group based work, learners consider different contexts, for example story telling of experienced SCCs (Szedlak et al., 2021), vignettes (Szedlak et al., 2019), or observing pre-recorded S & C content (Gearity et al., 2021). Learners can collaborate to construct and compare meaning to what is presented to them. Not all aspiring SCCs have access to authentic work place learning experiences, so encouraging sense making in this way can aid future problem solving by considering the interaction of different variables.

Social negotiation and interaction have been previously identified as crucial elements in acquiring knowledge. The importance of effective communication skills in the present study is in agreement with other S & C research where expert SCCs communicate effectively with large groups of athletes (LaPlaca & Schempp, 2020), play a critical role in the working relationships with sports coaches (Gillham et al., 2019) and influence engagement with athletes (Szedlak et al., 2021). S & C learning opportunities can be created for learners to verbalise their thinking processes and practice their use of language. Recently, James et al. (2021) provided examples of S & C learning activities, such as practical workshops and use of multimedia, assessment tasks including group thinking, self-assessment and mock interviews.

Successful coaches have been described as intrinsically motivated, willing to devote time and resources to professional development (Dawson et al., 2015). Specific to S & C, Springham et al. (2018) concluded that learning is a lifelong process for SCC students as the S & C field continuously grows with new knowledge, insights, and technology. Viewing learners through a lens of constructivism, they are responsible, active agents in the knowledge acquisition process (Loyens, 2007). Incorporating constructivist learning approaches will help progress SCCs to becoming continuous learners able to notice, interpret and respond to the contexts they are within, whilst collaborating and communicating effectively with others. Although Gleason et al. (2020) recently stated that many SCCs are not supervised in the traditional sense, it is important to create situations for learners to demonstrate that they understand a problem and the possible strategies available. Expert SCCs understand that there is always more to learn (LaPlaca & Schempp, 2020) and the exploration of findings from the present study offer practical examples of how coach development in S & C can include authentic content to enhance the level of preparation of SCCs for the workplace.

## 6. Conclusion

Within their role SCCs are required to make decisions across various contexts. The present study brought together experienced SCCs and their critical discussions offer considerations for coach developers regarding how to advance the strategies being designed to improve decision-making processes. A model is presented that can be used to guide SCCs' decision-making regarding training program design. Within education and accreditation settings, coach developers could incorporate this model when considering various S & C contexts. Those

SCCs currently in the S & C workplace can also benefit through their comprehension of the role that situational awareness, improvisation and metacognition have in navigating difficult within-role situations. The incorporation of learning content to stimulate the development of these capabilities is proposed to draw upon constructivist approaches. This makes learning a personal and active process and enables individuals to construct their own meanings within contexts, feeling the interaction and influence of different variables within them.

A strong understanding of theories and disciplines within the S & C domain provides a platform for SCCs to learn new content. Whilst the value in developing a comprehensive theoretical base is acknowledged, the present study highlights the importance of being able to access knowledge, make associations with new content and contexts and respond accordingly. It is important that those responsible for designing learning content and environments for prospective, and current SCCs, have a clear understanding of the current level of knowledge and experience learners possess and the demands of the S & C workplace. This understanding will support the design of authentic situated learning content addressing various contexts that learners can collaboratively engage in to better prepare themselves for the demands of the S & C workplace. It is anticipated that SSCs, across a range of experience levels, can relate to the content discussed in this study, as well as coach developers, and use it to stimulate future approaches as part of a sustained commitment to learning.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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