

Making the invisible, visible. An exploration of track and field coach's perspectives of their planning processes.

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Abstract

Purpose: The traditional understanding of how coaches plan for sporting performance is rooted in the assumption that coaches create periodised plans underpinned by physiological principles, thereby providing scientific credibility to their work. In contrast, there remains a paucity of literature exploring how coaches understand or think about their planning practices. The purpose of this study was to generate new knowledge regarding what information coaches actually consider within their planning processes and how they actually approach the task of planning. **Method:** Using rigorous, in-depth interviews, this study examined athletics coach's understandings of their everyday planning practices, in an attempt to contribute to narrowing the gap between academic research and real-world application. Twenty-eight highly experienced, high performance track and field coaches based in England (female, n=1, male, n=27) were recruited. The coaches were from the throwing disciplines (n=10) and endurance running (n=18). Coaches were interviewed about their planning process, using a maximum of three semi-structured interviews per coach, spaced across a full athletics season. In total this generated 68 hours of data. **Results:** The analysis demonstrated that, while the participant coaches utilised the principles of periodisation, their planning activities were not limited to this issue. The findings highlighted how the coaches conceptualised successful athletic performance in a holistic way: that is planning is multifaceted in nature. **Conclusion:** This study presents a holistic picture of the complexity of coaches planning, detailing the considerable time and attention given to planning for athletes' psychological, personal, and social development, to enhance athlete performance and development.

Key words: Planning, high performance, coaching, performance development, track and field athletics.

Introduction

High quality coaching is widely acknowledged as being an important component of high-level sporting performance¹. In most sports, the national governing body (NGB) run coach education programmes to help develop coach's effectiveness through improving their knowledge base and session delivery². To support the development of coaching knowledge and practice, Cushion³ suggested that the coaching process could be modelled in two ways, namely models *for* coaching or models *of* coaching. Models *for* coaching focus on the idealised representation of how coaches should operate, while models *of* coaching reflect what coaches actually do in practice.

Most coach education programmes are broadly based upon models *for* coaching. The central doctrine of these programmes is that competent coaches should be able to design an effective training programme that physically prepares athletes for optimal competitive performance. In the early 1960s, Matveyev developed an annual planning process, known as periodisation, which consisted of systematic, sequential cycles, or phases, of training^{4,5}. The theoretical basis for periodisation emerged from Hans Selye's general adaptation syndrome (GAS) model⁶. In short, GAS proposed that the body adapts to stressors, for example, physiological adaptations to the physical demands of training⁴. The success of athletes adopting periodisation, combined with the presumed underpinning scientific basis, gave periodisation both a creditability and legitimacy⁷. This work gave impetus to a bio-scientific approach to planning and coaching practice, whereby morphological adaptations to any given training intervention follow a predictable time course⁸. Consequently, periodisation became almost universally accepted as a planning modality and enshrined in coach education programmes^{9,10}. Indeed, wider research focused on physiological adaptation has made substantial progress in describing the '*what*' and '*how much*' features of sport specific training planning¹¹⁻¹³.

Periodisation was developed to optimise athlete performance on a specified date¹⁴ e.g., the Olympics. While periodisation remains the dominant approach to determining training programmes, over the past few decades there have been challenges to the methodology. Many sports compete across a season of fixtures rather than a single event or tournament. These competitive seasons are often long, leaving a short preparation phase that is inconsistent with Matveyevian¹⁵ training principles. Traditional periodisation develops multiple components of fitness simultaneously, however, some training stimuli can be incompatible e.g., strength and endurance⁷. Furthermore, periodisation details the cyclic ordering of training phases, usually within an annual cycle, consisting of variations in emphasis on specificity, volume, and intensity, to achieve optimal performance during the competition phase¹⁶. However, most studies claiming to investigate periodisation are short-term rather than covering a full training and competition cycle. In a review of periodisation research, Kataoka et al.,⁷ found only two studies that covered a period of 12 months: one on untrained participants, the other a retrospective analysis of elite performers. Out of the 100 studies they reviewed, 88 lasted between 4 – 18 weeks, not long enough to evaluate the sequential cycles of periodisation. These short-term studies were more about programming or micro management, of a training programme than the periodisation⁴. With the majority of studies orientated more towards programming, there appears to be an absence of evidence supporting the effectiveness of periodisation⁸.

To date, the available literature on planning can be divided into two categories (i) knowledge *for* planning, how planning should happen i.e., periodisation and (ii) a knowledge *of* planning i.e., how, and what coaches actually do in practice. Much of the knowledge for planning has focused on generating bio-scientific, physiological, and technical insights that can be used to underpin the development of 'effective' training plans¹⁷. The concept of periodisation represents knowledge for planning that has become the mainstay of training theory within sport science and coach education programmes. The underlying assumption is that coaches who work with performance orientated athletes will use periodisation as part of their planning process. Frequently, when expert coaches' perceptions of their practices are studied, attention is most commonly placed on *what* they do, rather than *why* or *how* they do it e.g., the training or coaching process¹⁸⁻²⁰. In the case of planning, attention has mainly focused upon programming rather than periodisation, whereby periodisation is the macro level e.g. weeks and months and planning is the micro level e.g., sets, reps, intensity⁷. Whilst this has provided invaluable information on the *what* and *how* behind the programming of athletes training, somewhat surprisingly the *why* has been largely ignored. Despite leading coaches often being innovators of training practices, ahead of the contemporary sport science knowledge, they are seldom involved in the research process²¹. Retrospective

84 analysis of these coaches often focuses their programming of training, rather than their planning process. Indeed,
85 the practices, knowledge and experience of coaches who work with consistently high-achieving athletes with
86 regard to the entirety of planning, have received sparse attention and are not reflective of the research literature²².

87
88 While research has advocated the use of periodisation to describe and guide planning, further investigations are
89 required to understand the processes and factors that facilitate and inhibit coaches in their planning process²³.
90 Thus, this study set out to investigate the planning processes of track and field coaches working with high
91 performing athletes. The aim of this interpretive study was to examine the breadth and scope of coaches planning
92 processes, to increase our understanding of the *how* and *what* track and field coaches plan for i.e., their
93 knowledge *of* planning and to understand their thoughts and meaning-making in relation to their everyday
94 approaches to planning.

95 96 **Methods and materials**

97 **Participants information and selection process**

98 Twenty-eight highly experienced, high-performance coaches, based in England (female, n=1, male, n=27)
99 participated in this study. In collaboration with National governing body (NGB) staff from England Athletics
100 (EA), the sample of coaches were selected from two (endurance and throws) of the four coaching disciplines
101 (throws, jumps, sprints and endurance). These were two cohorts that were of most interest to the NGB at the
102 time of the data collection. Opportunistic and purposive sampling²⁴ was utilised to support the recruitment of
103 participants by drawing on the combined sporting networks of both the lead researcher and the NGB officer.
104 Secondly, the two disciplines, had the greatest number of qualified and active coaches in the UK at the time
105 of data collection. The coaches recruited met the following criteria: i) actively coaching in athletics, ii) held a
106 minimum of a level 2 UK Athletics coaching qualification (coaches holding a Level 2 award or above, are
107 permitted by the NGB to plan, implementing training sessions and coach athletes independently) and iii)
108 working with athletes toward the achievement of a performance goal. As there were no restrictions on the
109 coaches age, sex, geographical location, the number, or level of athletes they were coaching, this data was
110 disclosed voluntarily by the participants. Institutional ethical approval was gained prior to data collection.

111
112 Table 1 details the coaching qualifications held based on the UK Athletics coaching qualification pathway.
113 Level 2 coaches are those who have specialised in a specific event, Level 3 are event specific performance
114 coaches and level 4 are senior coaches who may coach across more than one event group. Table 1 also provides
115 information on the performance level of the coach's athletes by drawing on McKay *et al's*,²⁵ participant
116 classification framework denoting Tier 1 to 5 athlete classifications; recreational, developmental, national,
117 international and world class respectively. Coaches ranged in age from 36 -77 years of age and had an average
118 of 19 years of coaching experience (range 5-50 years), at the time of the initial data collection period (table 1).
119 The composition of the sample included ten coaches from the throwing disciplines and 18 coaches from an
120 endurance running background.

121
122 << Insert 'Table 1: Participant Coach information' here >>
123

124 **Research strategy and philosophy**

125 Adopting a qualitative approach to this study, allowed the research team to investigate and probe coaches on
126 the multitudinous factors that are involved in their planning processes and to generate rich insights into the
127 meaning-making, experiences, and understandings of the participant coaches about their planning practices²³.
128 The design and analysis of the study reflected the research team's interpretivist paradigmatic position. An
129 interpretivist research approach holds to the view that research is a subjective, interactive (or transactional), and
130 co-constructed activity involving both the researcher and the researched²⁶. Rather than trying to develop
131 objective truths and predictive theories about what planning is or ought to be, we sought to explore the
132 experiences of coaches²⁷. Thus, we approached the analysis and interpretation of the coaches stories from a
133 "one of many" ways rather than from a "best or right way"^{28(p15)} to describe and implement planning processes.
134

135 **Data generation procedure**

136 In-depth semi-structured interviews were used to generate the dataset for this study. In-depth interviews are
137 excellent tools for gaining rich insights into the meaning-making and perspectives of the participant coaches.

138 Indeed, this type of interviewing allowed the research questions to remain the primary focus of the discussion,
139 whilst also encouraging participants to share any other factors that underpinned their decision understandings
140 of their everyday planning practices²⁹. An interview guide was developed and piloted with a small sample of
141 coaches. Following this process and the making of some minor modifications, the final interview guide
142 comprised six sections. These were: a) demographic information, b) coaching background, c) coaching
143 knowledge, d) planning knowledge e) experiences of planning for athletes, and h) reflections on planning
144 processes (see supplementary information). The data generated was from a, broader study, generating 68 hours
145 of data, that explored how the participant coaches attempted to navigate their planning processes and why they
146 did this in the ways that they did, generating original insights into the previously unseen and sparsely
147 documented social and relational aspects of coaches planning in track and field athletics and the interconnections
148 between those facets.

149
150 The use of cyclical interviews over an extended period provided a number of advantages^{30,31}. These included
151 a) generating rich insights into the participants meaning-making in relation to their planning activities, b)
152 systematically examining the participants accounts over time using a variety of different probes and follow-up
153 questions, and c) rigorously identifying patterns and differences in the meaning-making across a substantive
154 sample of track and field-athletics coaches^{30,31}. We approached the data analysis process from a non-evaluative
155 position. That is there was no best practice guidelines or framework in which we assessed the conformity of
156 the responses about their planning. The focus was on exploring their meaning making and their understandings
157 of their practise. The interpretation of the data did not consider there was a preferred response. Thus, we
158 carefully designed the interview framework to ensure that questions were a) framed in a neutral way, b) asked
159 about specific situations and behaviours and c) encouraged reflection on their own experiences of what they
160 intended and what they felt happened subsequently (during and between interviews) supported the interrogation
161 of the coaches accounts for consistency and ensured that the responses were genuine reflections of their actual
162 experiences rather than socially desirable answers. By adopting this approach to the data generation process, it
163 afforded greater time to actively listen to, and reflect upon, the experiences of a large sample, to inform more
164 meaningful probes, follow-up questions and systematically examine and understand their insights into planning
165 than other potential methods of data generation (i.e., questionnaires)³¹. Alongside active listening and
166 attentiveness to participant responses, elaboration (e.g., Can you tell me more about that?), clarification (e.g.,
167 Could you provide an example for me?) and detail oriented (e.g., Who was with you when that happened?)
168 probes were used to secure in-depth accounts of each participant's experiences and meaning-making³²⁻³⁴. At the
169 close of each interview, participants were asked an open question which aimed to prevent the omission of any
170 pertinent data that was not previously discussed within the interview (e.g., "Are there any other factors, not
171 previously mentioned, which you feel are important to your approaches to planning?")³⁵. All interviews were
172 conducted as one-on-one interview using a flexible interview guide that drew on the research objectives, and
173 analysis of any previously undertaken interviews with each participant (see supplementary information). Each
174 coach was invited to participate in a maximum of three interviews, that were scheduled to occur periodically
175 over the course of a full UK athletics season (September – August).

176
177 Each interview was recorded using a digital recorder. Transcriptions were completed as soon as possible after
178 each interview, drawing on the intelligent verbatim approach³⁶. The transcribed interviews were then imported
179 into QSR-NVivo (version 12) to assist with data organisation and analysis³⁷. In keeping with institutional ethical
180 guidelines, pseudonyms were used, dates changed, and identifiable events, competitions, locations, place names
181 or people were removed from the interview transcripts to support anonymity. All participants were coded by
182 two letters and a number. In total, 72 interviews were completed (face-face interviews,n=17 & telephone
183 interviews,n=55), which generated a total of 68 hours, 25 minutes, and 42 seconds of recordings.

184 185 **Data analysis process**

186 We drew upon the principles of a phronetic iterative approach to qualitative data analysis²⁴. This approach was
187 chosen as it supported the analysis of individual coach's experiences of, and the mechanism that have shaped
188 the coaches perspectives planning²⁴. During the data immersion phase, the lead author familiarised themselves

189 with the transcripts by relistening to the audio recordings and reading the interview text to develop an in-depth,
190 rich understanding of the coach's experience regarding planning. The lead author conducted the analysis process
191 of moving back and forth between data generation (interviews), initial and emergent readings of the data (emic
192 analysis), consulting relevant theory (etic analysis), and the sharing of the analytical insights with critical friends
193 (co-authors) and the participants (during 2nd & 3rd interviews)³⁸. Once the recurring patterns of meaning making
194 (primary themes) were generated from the interviews, they were then discussed between the lead researcher and
195 the research team to interrogate the interpretations and meanings. These themes were then further explored and
196 challenged during subsequent coach interviews to interrogate, identify and detail the most shared and recurring
197 patterns used by the coaches to describe their perspectives on planning. The research team, acted as the "critical
198 friends" in the analysis process, supporting the process of distilling the interview data into conceptual categories
199 to make sense of the coaches experiences and perceptions of their planning processes to develop figure 1²⁴.

200

201

Results and discussion

202 The presentation of the findings in this paper are part of a larger study that explored how and why the participant
203 coaches attempted to navigate their planning processes in track and field athletics. The key findings of this
204 study indicated that a) all coaches described the use of traditional periodisation as part of their planning process,
205 b) all of the coaches engaged in a richer, more complex planning process than is depicted in the current literature
206 and c) most of the coaches felt that more optimal performance benefits could be achieved by planning beyond
207 the physical dimension. That is, they planned for far more than the physical training programmes of their
208 athletes. Through the analysis of the interview data, three key interconnected high level planning themes were
209 developed in response to the research questions (see Figure 1).

210

211 The narrative from these coaches recognised the need to take account of much broader factors and the complex
212 and sometimes messy inter-play of these competing factors in their planning. They also recognised the important
213 role of subjective information, such as context, interactions, and personal and sporting biographies, as valid and
214 important- athletes are not just a passive body to be trained. Figure 1 provides further insight into the scope of
215 the planning process that comprised each theme, indicating the connections between them and how the coaches
216 articulated the key features that are characterised within the headline themes.

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218 << Insert 'Figure 1: The scope of coaches planning process' here >>

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Physiological

221 The study did not look to examine the programming, or micro level detail of individual sessions of how the plan
222 was implemented. As such, concepts such as training intensity distributions (TID)³⁹ were not considered in the
223 analysis of coaches planning processes, as it is a retrospective analysis of what was done. It therefore includes
224 both the planned and unplanned aspects. Rather, the study examined the processes that coaches drew upon to
225 periodise the training framework and how this was positioned used within their overall planning process to aid
226 athlete performance and development. Thus, in the physiological theme, the coaches shared their understanding
227 of what periodisation work they do and how it sits within the broader framework of planning. This theme
228 comprised four broader but inter-related elements that were part of the coach's overall perception of what their
229 planning practice entailed; the training framework; historical athlete data; setting and determining performance
230 goals, and their challenges to drawing on periodisation to aid their planning process.

231

Constructing the training framework

232 As anticipated, the coaches described drawing on the concept of periodisation to explain how they shape, guide
233 and structured their athlete's physical training across a competitive season (indoor and outdoor formats).

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235
236 *"I try to block it out into a base-ish phase, a more specific phase and then the competition phase. We tend to*
237 *transition from one to the other – they're not specific blocks; we try and gradually move from one to the*
238 *other." (EN18).*

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240 *'I use the framework of periodisation, but I don't really get into all this sort of macro-cycles and meso-cycles.*
241 *I think, for me, it sometimes can become a little bit too confusing and a bit too complex' (EN16)*

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'I'm going to have to work back there in terms of the blocks that I use, which is competition phase, pre-comp, special prep and general prep. And then just once I know what that totality is, I can then break it down into how many cycles am I going to use in that period? And, within those cycles, how can I then just alter training load, dosages etc weekly sometimes, even daily depending on what is happening' (TH 1).

Historical athlete data

All the coaches indicated that they were systematic in the collection of historical training and racing data. that the data gathered about the athlete subsequently underpinned the development and design of the training plan. This included examining the impact of any training adjustments on competitive performances. They described a period of analysis and evaluation to establish a physical profile for their athlete. For both current and new athletes this entailed the coach reflecting on previous seasons events and circumstance. The coaches drew on a range of objective information which included previous training diaries or programmes; results from previous competitive performances for example times/ distances achieved; placings; physiological testing data and any information regarding significant illness and/ or injury. By using this information, they were able to create an athlete profile which supported the development of the training framework (i.e., periodised plan)

"I look at what type of athlete they are...about their track record or profile of the athletes I've got, in terms of how much training they've done before, previous injury, what they can cope with" (EN18).

"The first thing is I would ask them if they've got a training diary. And then I would get the training diaries going back as far as they'd gone. I would do is look for patterns that occur in their training and racing... really scrutinise their previous training and racing..... I try to identify when they were running their best, was there any time when they look as though they've got stale because they've maybe done too many races, when injuries and illness happened etc. And I would really analyse up to that point in time, what had made them run well or not" (EN1).

Importance of setting and determining the performance goal

The planning process for the athlete's physiology required the coach (and athlete) to decide upon the performance goal and the associated performance criteria. It was clear from the coaches that they required explicit clarity on what the reality of the chosen goal was e.g., an outcome focused goal with clear objective measures. These outcome goals manifested for example as the time or distance to be achieved, the medal to be won or the finishing position in a designated competition.

"It starts with racing. So, for me, it's always racing. So what's the target for the winter? What's the ultimate goal for the summer? The training is all focused on producing that end goal" (EN14)

"So if we take the Olympics as the target then I look at the date and the performances needed, then in broad brush strokes I work backwards mapping out the seasons leading up to this and a progression in distances needed" (TH13).

Challenges to implementation of the periodised plan.

As noted earlier, the coaches described the organisation of their training plan at the macro level in line with principles of periodisation irrespective of their discipline. However, the coaches also described how that they must be prepared to think iteratively and flexibly within that broader framework and that the training plan most likely would evolve to accommodate the athlete's needs. Thus, any detailed physical planning beyond a small number of weeks, was recognised as futile. The coach frequently evaluated against their expectations and progress, and adjusted the plan based on their perceptions of had happened.

"... I think the bit that stuck out to me was you had to be mentally agile as a coach. You had to have that kind of – I always say golden thread, the lads take the mick out of me – but a golden thread of what you're actually trying to achieve then have (to change) or if it's slightly different, like, it's ok, because you're still trying to kind of work towards that end goal. I do have that drive for the athletes to help them reach their potential, but

295 *I'm happy to kind of meander my way through to get there. So, I'm a bit more fluid with my approach to it*
296 *(planning)" (TH11)*

297
298 *"That's why I never plan individual sessions out in advance. You know, I plan it out the day of the session*
299 *maybe the day before, having thought about where they're at or thinking about what happened in a race or*
300 *last session. Rather than saying, "Well, you need to do this next week." (EN1).*

301 All the coaches expressed universal acceptance that the fluid and dynamic nature of athletics meant that in
302 reality, the training programmes they set out at the beginning of each training phase were rarely completed in
303 their entirety. The practical reality of operationalising their plans was far from linear and unproblematic as
304 described within traditional literature on programming training.

305
306 *"I used to plan months ahead for athletes. I'd do big annual plans. And then something happens in week 2*
307 *.....- I've learnt it has to be really flexible because it is likely to change..... (you)just have to kind of react to*
308 *that and make changes"(TH10).*

309
310 Similarly to the work Kinnerk *et al.*,²³ the coaches described that at a broader level, their planning process was
311 based on the principles of periodisation. Bompa and Haff¹⁶ explained that periodisation is an approach in
312 which training is divided into smaller, easy-to-manage sections. This is the 'big picture' of the planning
313 undertaken by the coaches to structure their athlete's overall season, identifying the different blocks of training
314 in which they can emphasise various physical, psychological, tactical, and technical goals⁴⁰. As periodisation is
315 the generalised planning process of breaking the annual training year into smaller epochs, it is perhaps
316 unsurprising that both endurance and throwing coaches demonstrated a shared understanding of how they
317 planned and organised their athletes annual training, drawing on the same body of knowledge and language of
318 periodisation¹⁶. Indeed, the coaches reflections detailed above mirrored Kiely's⁸ view that conventional
319 periodisation models are inadequate and lacking the flexibility to enable coaches to adjust and react to the
320 dynamic, continuous and unpredictable context in which they operate. Kiely^{8(p243)} described periodisation as
321 being stuck in the "culturally persuasive planning heritage" of reductionism. The coach's reflections on their
322 actual planning indicate that their experiences and reflections has considerably moved away from that
323 reductionist approach to a broader conceptual understanding of what planning really is. Notwithstanding this,
324 the reliance on periodisation to describe their planning, can be understood through the legacy of periodisation
325 as a recognised, visible and credible way to describe what they do. Pol *et al.*,¹⁸ presented a conceptual
326 framework advocating the need to recognise and adopt a multi layered approach (i.e., the importance of the
327 goal, athlete profile, event demands etc) to coaching and athlete performance. We found that the coaches
328 experiences would support their assertions in the conceptual framework, in that, the planning does not mirror
329 the linear and unproblematic process that is presented in the periodisation literature¹⁶.

330
331 *"There is a destination and a plan is specific journey for that athlete, but I've learnt that the details of the*
332 *steps on that journey evolve as you progress along it - it is never as simple as the book says" (TH13)*

334 **Psychological**

335 This theme represented the planning that was undertaken in order to facilitate the psychological development
336 of athletes. This theme comprised two broader but inter-related elements that were proactively planned for;
337 competitive performances; personal characteristics of the athlete, and athlete behaviours.

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339 *"As I said before, you know, getting to know the athlete and the psychology of that athlete and how their*
340 *minds think, is really critical, because it affects how you deal with them" (TH13).*

341
342 *"...I think everybody is different.....people react differently to training, mentally and physically. And to the*
343 *number of races, the type of races to run . And I think the coach's job is to get all that mish-mash, put it*
344 *together, and work out what is best physically and mentally for that runner" (EN1).*

345
346 It was strongly acknowledged by all the coaches, that there was a planning requirement for them, that stretched
347 beyond the physical training programme. The planning undertaken for the psychological was formal in nature,
348 without being written down and not widely shared amongst key stakeholders. The coaches described how they

349 deliberately attempted to enact strategies to support their athletes psychologically. As noted throughout the
350 discussion below, some of these were planned well in advance and deliberately introduced at specific times
351 within the training framework (i.e., pre-competition routines, training sessions, re-shaping of athlete
352 perceptions), whilst others were planned much closer to the time of delivery, such as how they would respond
353 to the situations they encountered in context (i.e. personal characteristics).
354

355 ***Competitive performances***

356 The analysis indicated that the coach's primary role in planning to support the development of the athlete's
357 psychological state was to help aid successful performance. Many of the coaches articulated clearly that they
358 felt it was imperative that the physical and psychological must be in harmony with each other to support the
359 achievement of the athlete's goals. The psychological development of the athlete focused on the coaches
360 attempting to support the development of areas such as resilience, and mental toughness, to augment the chances
361 of the training and competition plan being successful. One specific area identified by the throws coaches as
362 important, was helping the athletes deal with in-competition pressure, these were planned strategies, deliberately
363 introduced at a specific time within the training framework.
364

365 *"I do preparation competitions at my training base, where we simulate those competitions, so we'll do a call*
366 *room scenario. They'll know about the competition beforehand. They'll only have two or three warm-up*
367 *throws. And it's all about them practising for those big competitions.... they've really changed the way they*
368 *behave when the stress is on them and I've seen a lot of things I've never seen before" (TH10).*
369

370 ***Training (pre-competition)***

371 Further planned strategies that emerged as part of the coach's toolbox to enable them to support an athlete's
372 psychological development included session manipulation with regard to volume, presentation of performance
373 outcomes and outputs i.e., times or distances achieved within the training session; the use of one to one
374 discussions attempting to remove any perceived pressure felt by the athlete through concealing their own
375 performance expectations; building belief in the athlete's ability to manage competition pressure in order to win
376 competitions or to beat key opponents; establishing and implementing familiar routines and the replication of
377 competition in training to build the athletes individual resilience and confidence in their own ability to
378 effectively cope with, and keep performing in the face of the challenges of competing and training at a high
379 level (described as mental toughness). Again, these were planned at the macro level, with the coach deliberately
380 introducing them at specific points in the year.
381

382 *"I use some of the sessions... A bit of mental toughness really. You know, we've got a particularly steep hill in*
383 *the woods that we useyou know, even if they're on their knees, you know, they're not going to give in.*
384 *They've got that mental toughness... But I think that's quite hard to develop" (EN18).*
385

386 *"I don't tell them anything like a total lie in the sense that they're going really well when they're going*
387 *absolutely rubbish, but, you know, there are times when I might just try and raise their spirits a little bit and*
388 *say to them maybe it was better than it actually was or provide a rationale that is acceptable to them (EN4)*
389

390 *' [It's] that level of belief and level of positivity that you're building for that week before [the competition],*
391 *then carries forward through to the competition that [the athletes] feel invincible....you might just change the*
392 *weights three or four times in a training session to something that they're definitely comfortable with at that*
393 *time. So they're blasting it out and it's feeling good' (TH6).*
394

395 The fixed nature of major competition dates also allowed the coach to use planned and proactive psychological
396 strategies, for example regarding the type and volume of training, with the interactions between coach and
397 athlete, becoming deliberately positive in the lead up to competition, reinforcing belief in the athlete's ability
398 and current capabilities in attempt to provide a situation (i.e., competition) specific 'boost' to their athletes.
399

400 *Whenever we've got a big competition coming up, the four weeks beforehand, I make sure that in his*
401 *programme he's got the 6, 7, 8 [weight of implement]. It's not so much that he works any better than anything*

402 else. But, for him, he believes that's the thing that does the business and that will really bring him to perform'
403 (TH13).
404

405 *'If I stopped a session short, I wouldn't necessarily share the reason for that. You know... You're doing it*
406 *because you want them to be really confident or not be too down about something... so you know you think*
407 *about what to say and give them what they need to hear, You know, "You're flying. You're great. Let's get*
408 *ready for the championships" and it's more a psychological thing to do that than a physical' (EN1)*
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410 The coaches also acknowledged that they spent time planning how to emphasise and reinforce positive messages
411 from training and competitive situations so that any feelings of frustration, non-success, setback, or failure in
412 the athlete could be managed. For example, coach EN16 described a deliberate strategy of subtly moving the
413 discussions with athletes from outcome (i.e., the results – time or position in the race) to process goals (how
414 those results were achieved – for example tactical execution, commitment to the race plan etc) to attempt to
415 remove any (perceived) pressure or to deflect the athlete's attention from areas that were not progressing as the
416 coach expected.

417
418 *" But you have got to tap into that mental preparation and resilience, in terms of picking her up and lifting*
419 *her psychologically to keep her involved in the sport. So the main thing, what we've actually done is focus on*
420 *process goals. You know, instead of actually, basing her performance on where she comes she needs a little*
421 *bit more process goals, where we can say "Well, ok. Didn't come 10th but, you know, you were being*
422 *competitive (EN16)*
423

424 **Competition schedule**

425 Coaches indicated that a feature of their planning involved making very deliberate and careful choices about
426 the individual athlete's competitive programme. They recognised that the potential impact of this could have
427 for the athlete, and ultimately influence how successful the overall process had been. As acknowledged in the
428 physiological section, the initial identification of a specific performance goal was important in supporting their
429 use of periodisation to form the annual training plan. However, they also carefully planned the selection of the
430 programme. They considered the psychological impact of the racing programme for their athletes.

431
432 *"as the season approaches, athletes themselves are looking for pointers about form and that can affect their*
433 *confidence... You know, so you've got to be careful about where people race and putting them into races at*
434 *the right time...But they've got to have confidence in what they're doing in training" (EN5).*
435

436 The track coaches spent a substantial amount of time, considering and planning what races to enter their athletes
437 into, the other athletes who might be within those competitions, and any implications of a defeat or perceived
438 under performance.

439
440 *"So we've pulled back a bit on it, just pulled her out of races basically. I could have said You're doing them"*
441 *and she would have done them, but.....She was in tears before the north-easterns. And it's just expectations,*
442 *within her family and the club and she was expecting to win...she doesn't want to let anyone down, you know"*
443 *(EN3).*
444

445 *"As a coach, I'm more prepared to expose [Name] to risks than I am with [Name], because [Name]*
446 *psychologically can actually handle the setbacks, whereas with [Name] it can just sort of rest there for a week*
447 *or two and knock her back, so then you have to rebuild her confidence up and stuff like that. It's very difficult*
448 *to develop those psychological skills in the athletes" (EN16).*
449

450 **Personal characteristics**

451 The coaches also recognised that the development of an athlete's self-confidence and self-esteem were also
452 important factors that required planning for. The coaches intentionally planned how they interacted with their
453 athletes, however this might be closer to the point of delivery than the competition programme planning for
454 example. For example, the coaches planned what they would say, how they might preset the information they

455 had and who they could say what to, to supporting any ‘reshaping’ of the athlete’s perceptions of events, to
456 have a more positive outcome to support maintenance of self-esteem and self-confidence.

457

458 *“...you know, as a coach then you’ve got to, “Well, look, to me that was worth a second and a half faster”*
459 *because if you don’t tell them that, they go home and write it down, it plays on their mind. “That was a crap*
460 *session.” You know? Well, it wasn’t, but I think you’ve got to try and get through to the athletes as well;.....So*
461 *it’s all about mind games, coaching, a lot of the time” (EN4).*

462

463 The coaches spent time planning how to emphasise and reinforce positive messages from training and
464 competitive situations which otherwise could manifest in feelings of frustration, non-success, setback, or failure.
465 Similarly, to the earlier point regarding the planning for competitive performances, this theme appeared to focus
466 on providing ongoing non-situation specific development in order to aid overall athletic performances.

467

468 *“I need to work with them, talk to them and manage any training so they can come out the other side in a*
469 *better place you know, especially through bad times when things aren’t going well....but it is about so that*
470 *when they go into the next race, that, they’re in a good place and we can get it right” (EN7).*

471

472 *“When it comes to them... It’s how they deal with the failures. And let’s face it, in athletics, no matter how*
473 *you look at it, athletics is essentially a large series of training and working very hard and feeling tired and all*
474 *the other stuff that goes with that, followed by a significant number of failures, followed by – if you’re really*
475 *luck – a few successes” (TH10).*

476

477 The coaches were also able to clearly describe experiences in which the lack of attention to the supporting the
478 psychological state of the athlete had caused negatives issues for the athlete, such as increasing the pressure the
479 athletes felt in competitions, not achieving the results they had hoped to or reducing the athlete’s enjoyment of
480 the sport.

481

482 *“And, as a coach, I was never adequately prepared for this (psychology) And it’s part of your planning as*
483 *well, because you have to when you create a plan.....A lot of coaches write a session... But then you have to*
484 *sit back, think about, and look at the impact that has on the athlete – it never gets spoken about, but good*
485 *coaches do that too” (TH3).*

486

Athlete behaviours

487 The coaches reflected that their planning process included ensuring that there was a need for coherent ethos
488 within their training group, harmony between themselves and the athlete, the athletes, and the expectations of
489 behaviour. This was recognised across both disciplines as an important feature of the coaches planning
490 process.

491

492 *“there’s kind of a common mindset here- that’s probably the entry point (to the group) really. You know, if*
493 *you’re just playing at it, they probably wouldn’t fit in with the team ethos that there is. There is nothing wrong*
494 *with that, but that would be my choice to work with that athlete in a different way” (EN6).*

495

496 *“If you want to coach athletes at a more successful level, you can’t do it without having smaller groups but*
497 *also, it’s very important that the group, as a whole, work together in harmony...” (EN15)*

498

499 *“And the thing is, within a group, you can’t let an individual destroy the group. And you’ve got to look at the*
500 *group dynamic and ensure that it is working well, it is not just about the individual. Doesn’t matter who it is”*
501 *(TH6).*

502

503 A common strategy used to support the development of their preferred ethos, was the planned interactions with
504 athletes within their coaching group to help set and maintain the expectations of the training group. This
505 involved the use of both individuals and the collective group to establish what they felt was an optimal training
506 environment (Johns et al., under review).

507 *‘.....And I can do that one-to-one or by simply sending one or two athletes out discreetly in the group.*
508 *Because athletes talk within the group quite easily. And they also have observations about the other athletes*
509 *within the group - that is vital in supporting my planning” (EN15).*

510 **Social development**

511 This theme further emphasised the breath of planning undertaken by coaches in the pursuit of developing better
512 athletes, with planning moving beyond the boundaries of developing an athletic body and a robust performance
513 psychology. Both personal skills and social development of individuals was characteristically described as being
514 able to help athletes develop as individuals e.g., their ability to connect to others, understand the need for
515 compassion with others and take personal responsibility for their actions both within and outside the athletics
516 arena. The nature of the coaches planning practices were characterised by a desire to help athletes achieve their
517 sporting potential tempered by the recognition that life beyond the athletics arena could not be ignored or pushed
518 into the background – it was a key facet to developing better athletes and performances.

519
520 *“the simplest answer to that would be for the athletes to be as good as they can be.....But actually I don’t*
521 *restrict that to athletics. I’ve had a number of athletes who have undoubtedly benefited by being athletes – or,*
522 *you know, training and being part of a coaching group and having, if you like, a coaching family – who have*
523 *then benefited in their lives in other ways and 100 have gone on to do other things” (TH7).*

524

525 **As individuals**

526 The coaches noted the interconnected nature of many facets of their planning (figure 1). In undertaking planning
527 related to their athletes beyond the athletics environment, they recognised the relationship and interchange
528 between this work. In discussing how they felt they wanted to help the athletes develop ‘as a person’, the coaches
529 described aiming to help develop skills and attributes that they felt important beyond the sport, such as personal
530 resilience in dealing with challenges across other areas of the life, self-confidence (for e.g., being able to engage
531 with other people), being independent, working as part of a team and life skills such as time management and
532 respect.

533

534 *“And I’ve given them [his athletes] the example mind map of another athlete....I don’t know if it’ll work but,*
535 *for me, where I’m coming from is it’s helping them, it’s empowering them to take ownership of what they want*
536 *to try and do..... And for me then to look at it, it shows me what they see as important” (TH1).*

537

538 *“..... But the other part (for the athlete) it is about learning how to behave as an ordinary, decent human*
539 *being, which is part of what we do as coaches, because we want them to be fine people rather than just fine*
540 *athletes” (TH2).*

541

542 *“You get a kid that’s shy and won’t look at you... He looks at the floor. Shoulders are down. You know, he’s*
543 *got no real self-confidence. And then you take him on. You get him straightened up. You get the shoulders*
544 *back; you get the head up. They’re willing to look you in the eye. They’ll shake your hand. You see that whole*
545 *grow-up path of... Of young kids growing into adults and... I enjoy giving them life-skills to cope with stress*
546 *and pressure and being able to hold their own with anybody” (TH6).*

547

548 Purposeful and deliberate interaction was a key part of the coach’s planning process in aiding the athletes
549 personal and social development. Through asking the athlete to put suggestions and ideas forward for
550 consideration to help guide any decisions regarding the plan, the coaches felt that they could support the athletes
551 to start to take ownership and responsibility for the progression of their athletics career and ultimately; help
552 them beyond athletics when making career and lifestyle choices.

553

554 *“They man-manage their own week, centred round their own work patterns, their schooling or university.*
555 *They can man-manage themselves. Then, their attendance to the club – I expect to see them a minimum of*
556 *twice a week, sometimes three. We communicate on Skype or by telephone. And it’s got to be a two-way thing,*
557 *where I have to call them about things, as much as they have to communicate to me” (EN15).*

558

559 The coaches in this study recognised and intentionally planned proactively, accounting for non-physical factors
560 within their own coaching context (i.e., psychological, and social) and attempted to effectively support the
561 athlete’s development and performance. The complex, interacting nature and breadth of the coaches planning
562 processes detailed in this study agrees with the conceptual framework provided by Pol et al.,¹⁸. Pol and
563 colleagues advocated that traditional approaches to planning training (e.g., periodisation) have ignored that
564 physical components are coupled with the social-psychological nature of performance. The coach’s perception
565 of their planning processes advocated a process encompassing the social to the biomechanical and beyond,
566 holistically accounting for the physiological, psychological, and social factors. The planning processes of these
567 coaches appears to provide support to Pol et al’s.,¹⁸ depiction of an interacting and cyclical relationship of the
568 performer and their environment. Furthermore, the coaches planning experiences also support the suggestion
569 that these traditional siloed areas are relational, in that they are continuously influencing, shaping, and guiding
570 each other within the overall scope of the coaches planning process.
571

572 The planning process that the coaches undertake is about adding ‘value’ to the athlete across three broad areas
573 (i.e., physiological, psychological, and personally & socially). These coaches planned through an investigative
574 process, encompassing the symbiotic components of the biopsychosocial performance. They articulated the
575 multitude of inter-relationships between the physical, psychological, group versus individuals (both biologically
576 & culturally), society and the environment. That is, the coaches recognised that different facets make up an
577 ‘athlete’ and for the physical planning process to be operationalised and function effectively, they must adopt
578 an athlete centric focus. Unlike the planning for the athlete’s physical development, planning for psychological
579 factors or the personal development was generally, but not always, characterised as something that could not be
580 fully planned out in advance. Operationally, planning was sometimes short term and dependent on the coach’s
581 ability to decode and read the athlete, situation, and the environment within the framework of their overall
582 planning. Similarly, to Richie et al’s.,⁴¹ work on tapering, there was one common exception within the planning
583 for the psychological development of their athletes which allowed the coach to pre-plan well in advance what
584 they wanted to do. This was in the lead up to a major competition. Coaches reported that in this situation they
585 felt able to proactively plan to influence how the athlete thought and felt.
586

587 Hamel and Gilbert^{42(p486)} suggested that, in general, sport coaches are becoming more “sensitive to the ecology
588 of the athlete”. The coaches explicitly recognised the importance of viewing their athletes holistically. This
589 enabled the coaches to plan for the athletes on an individual level. Similarly to the work of Anyadike-Danes et
590 al.,²² who acknowledged the important role of non-physical factors to maximise athlete performance, we found
591 that coaches were cognisant that their role extended far beyond the need to improve the fitness of their athletes
592 (i.e., psychologically, socially & emotionally) in an attempt to foster a more favourable environment in which
593 to development athletic performance.
594

595 The coaches perceptions of the planning they undertake, has not previously been reported in the depth or volume
596 presented here. Through engaging in multiple interviews over an extended period, with a large sample group^{31,38}
597 rich, detailed and expansive accounts of the breadth and complexity of the coaches planning has been
598 interrogated in greater depth than previously represented in other planning focused research. We found that the
599 process of planning is far from being an unproblematic and linear process and solely concerned with the
600 development of an athlete’s physiological capabilities (i.e., the programming of training). Similarly to the work
601 of others^{23,41,43} this qualitative, interpretivist study has been able to gain a much deeper understanding and
602 interpretation of coaches’ feelings, thoughts, and beliefs about their planning practices.
603

604 *“Underneath the iceberg (the physical training plan) there’s another great big bit of ice, isn’t there? What we*
605 *do as coaches is think about everything in there – we’ve got probably 20 different things under the water that*
606 *they (athletes) don’t even know about, maybe they do not want to know either – and probably don’t even*
607 *appreciate that they are there” (TH10).*
608

609 **Limitations and future research**

610 Our study has provided valuable insights into the extent and content of coaches planning practices; however,
611 no study is without limitations. In the context of this study, it is pertinent to acknowledge that the perspectives
612 presented are always those of the coaches, their reflections on their own planning practices and their individual

613 intentions and the meanings they attached to their actions. It is important to note that we did not observe the
614 coaches planning process in situ. This may be viewed as a limitation of the data as we did not capture the
615 dynamic interplay between intentions and actions in real-life situations. To counter this argument and to mitigate
616 against social desirability in the data, it must be noted that it is not possible to record all of the reality experienced
617 by an individual. As noted in the method, through prolonged engagement in the data generation process, trust
618 was built to allow for interrogation of, and challenge representations and intention of their planning.
619 Additionally, the recruitment and engagement of twenty-eight participants from across the athletics coaching
620 sector, afforded us the opportunity to see the clear insights, lines, connections/consistencies, and shared
621 understanding between the coaches regarding how they viewed planning. The depth and rigour of our data
622 generation process is not possible with other approaches e.g. questionnaires. Finally, in line with our
623 interpretivist positioning, we were not looking to establish a one 'truth' about planning. Thus, as noted earlier,
624 the model presented in this paper is an attempt to present the shared understanding of what the nature of planning
625 really entails and means to these coaches.

626

627 Additionally, the heterogeneity of the participants should be acknowledged with 18 of the 28 coaches recruited
628 from the endurance discipline and only one female coach able to participate in the data collection process (three
629 females were initially recruited). The recruitment process did not target a specific sex of the participants. As
630 this sample is generally representative of the wider coaching population in athletics (both sex and level of
631 qualification held), it would be pertinent to explore, the experiences of females coaches who work with high
632 performing athletes in an attempt to develop a more nuanced understanding of their experiences. Finally, it
633 should be acknowledged that a) the coaches within the study were all working with high performing athletes
634 and b) the majority of these coaches (those outside of funded programs - table 1) worked on their own to
635 complete their planning and enact their preferred planning process. Future work should examine if these findings
636 are representative of the planning process of coaches a) at different performance levels and b) who's athletes
637 consistently perform at high levels. It would be of interest to explore whether the successful coaches across
638 other sports, were the ones able to see beyond the reductionist framework of periodisation, that they are
639 indoctrinated into through coach education.

640

641 **Practical applications**

642 Within the context of understanding track and field athletics coaches' practice, these findings have implications
643 for the learning and development of coaches at all levels. We acknowledge that there is a need to support coaches
644 with knowledge acquisition related to scientific principles of training and physical adaptation. Yet the coaches
645 in this study recognised that the plan is only one small element to the overall concept of planning and that the
646 physical training plan would have a much greater chance of succeeding if there is detailed planning for the wider
647 social dynamics and interactions that are present in coaching practice. Coach education providers should look
648 to integrate these perspectives into their education programmes to raise the awareness of these factors in their
649 planning work. Indeed, we would suggest that their needs to be a departure from how coaches are currently
650 educated on planning and what it entails, in order that they are better equipped to move away from viewing
651 planning as a one-dimensional process. This would support coaches to recognise the level of engagement
652 required to plan for more optimal performance environments and athlete development. We suggest that these
653 findings have the potential to increase the awareness of the breadth of skills required by coaches - fundamentally
654 changing the way planning is viewed and what it is to be an effective coach. It may also be pertinent for
655 mentoring programmes to engage with the perspectives presented here, with the potential to encourage more
656 nuanced thinking about planning to support positive changes in coach's practice and athlete performance.
657 Novice coaches, in particular, could benefit to be exposed to these factors within the education programmes,
658 helping to develop an awareness of the foundations on which to develop their practice. Consequently, the
659 presentation in coach education literature, of what effective planning entails should be broadened and moved
660 beyond purely the mechanical prescription of future training parameters, to embrace the reality described by
661 our coaches⁹. Finally, raising awareness of these planning processes, the importance of understanding
662 individuals' intentions (what is planned for) and the context of their actions (why), can support the design of
663 better training programs and influence training and performance outcomes.

664

Conclusion

665
666 The aim of this study was to examine the extent and content of coaches planning practices in real-world high-
667 performance athletics coaching environments. We found that coaches planning extended far beyond the
668 traditionally depicted linear process; in fact, it was far more complex and multilayered. Our results show coaches
669 are cognisant that planning is a more extensive process than the seemingly smooth, flawless (reductionist)
670 process of periodisation that is presented within the literature and coach education programmes. Ultimately, our
671 research suggests that while physiological considerations are important, they do not dominate coaches' planning
672 processes as much as previously thought. This broader approach to planning to develop athlete performance
673 provides a novel viewpoint that could influence future practices in sports science and coaching. For sport science
674 practitioners who work alongside coaches of high-performance athletes, embracing the novel insights from this
675 manuscript, may improve their ability to work collaboratively with coaches. In raising their awareness of other
676 modifiable and planned variables that coaches believe could support training adaptation, positive changes in
677 athletes' performances may be achieved.

Ethics statement.

Northumbria University ethical committee approved this research. The participants provided their written informed consent to participate in this study.

Author contributions.

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Table 1

Pseudonym	Event group	¹ Level of coaching qualification held (UK Athletics)	² Highest level of athlete(s) coached	Approx. no. of years spent coaching
* EN1	Endurance	4 – Senior coach	Tier 5	40
EN2 ^a	Endurance	4 – Senior coach	Tier 3	30
EN3	Endurance	3 – Performance coach	Tier 4	15
EN4	Endurance	4– Senior coach	Tier 4	25
*EN5 ^a	Endurance	4– Senior coach	Tier 5	5
*EN6	Endurance	5 – IAAF coach diploma	Tier 5	21
*EN7	Endurance	3– Performance coach	Tier 5	15
EN8	Endurance	2 -Event group coach	Tier 4	12
EN9	Endurance	2 Event group coach	Tier 4	25
EN10	Endurance	3– Performance coach	Tier 3	30
EN11 ^a	Endurance	2 Event group coach	Tier 3	15
EN12	Endurance	4– Senior coach	Tier 4	30
EN13 ^a	Endurance	2 Event group coach	Tier 2	8
EN14	Endurance	4– Senior coach	Tier 4	40
EN15	Endurance	4– Senior coach	Tier 5	50
*EN16	Endurance	2 Event group coach	Tier 4	8
EN17	Endurance	3– Performance coach	Tier 3	15
EN18	Endurance	2 Event group coach	Tier 4	15
TH1 ^a	Throwing	3– Performance coach	Tier 3	10
TH2 ^b	Throwing	2 Event group coach	Tier 4	20
TH3	Throwing	4– Senior coach	Tier 4	20
TH6 ^b	Throwing	3– Performance coach	Tier 4	14
TH7	Throwing	4– Senior coach	Tier 3	20
TH9	Throwing	4– Senior coach	Tier 3	50
TH10	Throwing	3– Performance coach	Tier 2	10
TH11	Throwing	2 Event group coach	Tier 3	10
TH12 ^a	Throwing	2 Event group coach	Tier 3	10
TH13	Throwing	3– Performance coach	Tier 4	15
<p>Notes:</p> <p>¹ Since data collection, UK athletics has changed the way they describe each level of qualifications (Oct 2023)</p> <p>² Based on the participant classification framework by McKay et al²⁵</p> <p>^a = completed one full interview. ^b = completed two full interviews. No letter = completed three full interviews.</p> <p>* denotes coach with athlete(s) on a funded programme at the time of data collection</p>				

Table 1: Participant Coach Information

Figure 1

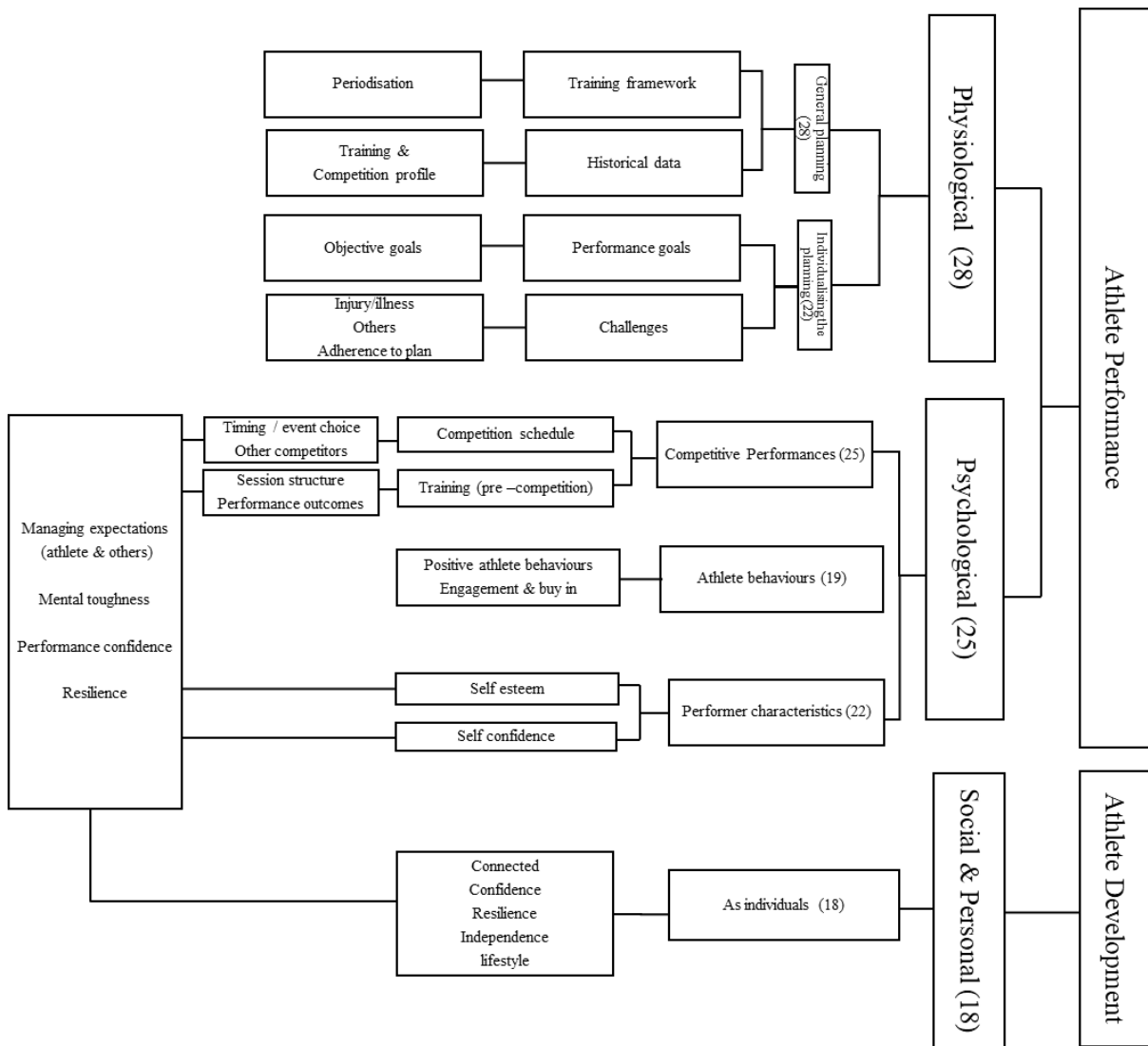


Figure 1: The scope of coaches planning process.