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Investigating academy coaches' epistemological beliefs in red and white ball cricket

Matt Crowther^{a*}, Dave Collins^{b, c}, Loel Collins^{b, c}, David Grecic^a and Howie Carson^c

^a*Institute of Coaching and Performance, University of Central Lancashire, Preston, UK;*

^b*Grey Matters Performance Ltd, UK;*

^c*Moray House School of Education and Sport, University of Edinburgh, UK.*

*Please direct all correspondence to the lead author via email; mcrowther1@uclan.ac.uk

Abstract

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Cricket and specifically cricket coaches are presented with challenges unlike many other sports. Coaches are tasked with developing players' skills and abilities to play two distinct and increasingly specialist formats of the game, namely red ball and white ball cricket. To examine differences across these two styles, data collection used observations ($n= 18$), semi-structured interviews ($n=23$) and focus groups ($n=2$) with a group of coaches who actively coached both styles to the same groups of players. Two storybook themes were developed and represented a substantial and original contribution to the literature. These were; i) get your head down, listen to me and you'll be right; in RBC as contrasted with ii) players getting stuck in to learning in WBC. Findings suggest coaches held different epistemological beliefs and actioned different epistemological chains. Fundamentally, coaches' approaches were considerably different across RBC and WBC. We conclude by considering the significant implications of the findings in the form of an extension of the epistemology literature and the ongoing opportunity for cricket coach development.

Keywords: Planning, Skill development, Coaching philosophy

51 **Investigating academy coaches' epistemological beliefs in red and white ball cricket**

52 **Introduction**

53

54 Cricket has seen a global growth in popularity (ICC, 2018), in part due to the increase in
55 volume of newer, shorter formats (ICC, 2020). These new forms offer a more exciting shorter
56 version of the traditional Red Ball Cricket (RBC) game; the traditional multiple day format
57 played with a red ball. It is well accepted (although perhaps anecdotally) by players, coaches
58 and administrators that RBC represents the *ultimate challenge*, for the *ultimate player*.
59 Historically, the *greatest* players have been crowned based on their performances and
60 longevity in RBC. This was also the place where players most regularly earned their living.
61 The newer format, white-ball cricket (WBC) has three versions, (1) 50-over cricket
62 (scheduled to last c.8 hours) (2) 20-over cricket (scheduled to last c.3.5 hours) and (3) The
63 Hundred (scheduled to last 2.5 hours). Reflecting the name, all are played with a white ball.
64 As a result of its increasing popularity and the development of worldwide leagues, players are
65 increasingly able to earn their living playing only WBC. It should be noted that these' WBC
66 specialists are so far rare, with most players heavily involved across both formats. Notably,
67 however, in the recent and prestigious RBC test series between England and Australia (the
68 Ashes 2021-22), England's 'demise' was attributed to a lack of balance between the two
69 formats, with a great deal of consequent comment and soul searching (Sky, 2022). In short,
70 developing players towards performance in both is an important (if perhaps difficult) dream
71 goal for the sport and all involved in it.

72 The different formats lead to a range of demands on both players and coaches,
73 specifically in relation to the development of players' skills at an earlier stage in the pathway.
74 One relevant example here is a player's competitive schedule. Developing players are
75 involved in both RBC and WBC competition (i.e. fixtures) within the same season.
76 Addressing the micro-level, a players' week may consist of WBC at the beginning of the

77 week (i.e. Monday), followed by RBC in the days that follow (i.e. Tuesday – Friday) prior to
78 a second WBC commitment as the week closes (i.e. Sunday). Consequently, players are
79 required to perform a multitude of skills across RBC and WBC within a very short space of
80 time. Factor in that these players are balancing their training needs alongside their education
81 and the potential strain on players and coaches becomes clearer. Consequently, how is it that
82 coaches are going about developing the RBC *and* WBC skills of young players given the
83 complexity of the cricketing landscape? The ways in which coaches action learning these
84 skills from an epistemological perspective is worthy of exploration especially, as is the case
85 in this study, coaching in both styles is often provided by the same coaches to the same
86 players.

87 Accordingly, and building on earlier work by Crowther et al. (2018), this study
88 explored the epistemology of coaches working with *the next generation* of players in the
89 talent pathway. We aimed, firstly, to critically examine the epistemological beliefs of coaches
90 involved in coaching RBC and WBC and secondly, to develop a framework that presents an
91 epistemological basis for both forms of the game.

92 **What is epistemology and how is it defined?**

93

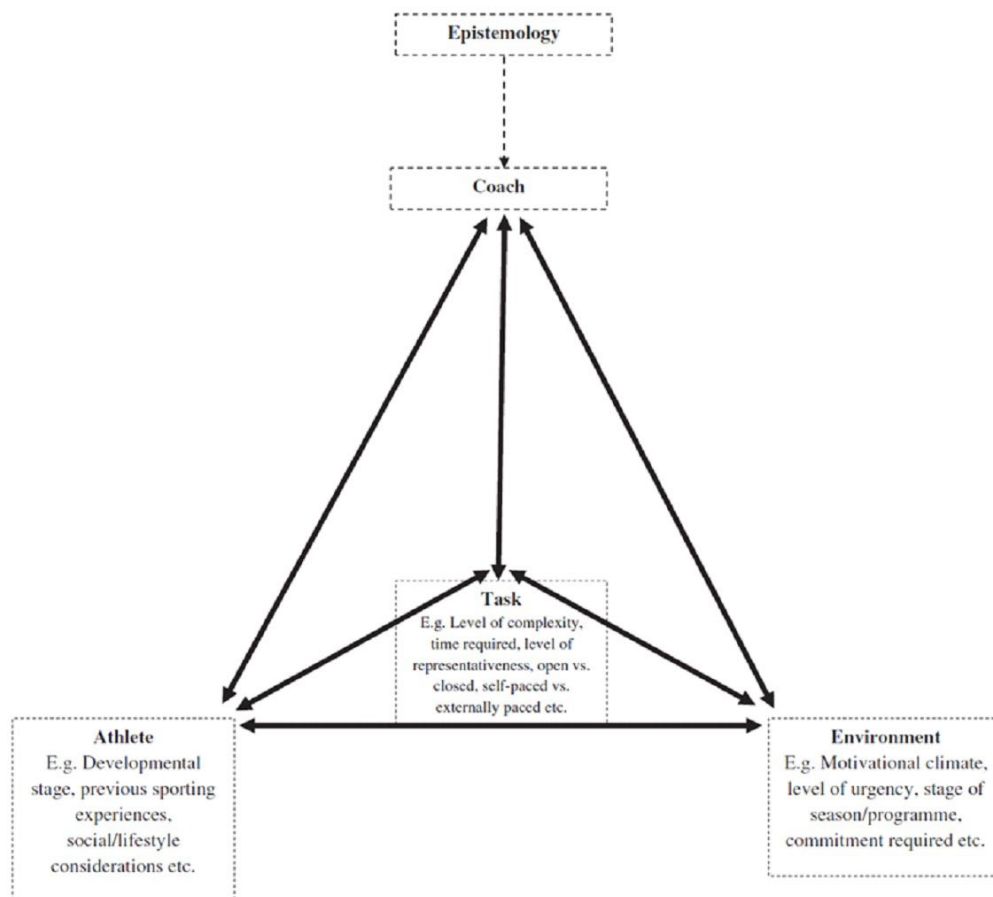
94 Epistemology is a branch of philosophy that aids coaches to clarify motives and provide
95 direction to their practice (Kretchmar, 1994). Early work around epistemology plotted
96 epistemological development on a continuum between naïve and sophisticated (Perry (1968)).
97 Naïve epistemological beliefs view knowledge as simple, clear, and specific; handed down
98 from authority rather than developed from reason. This position is premised on an assumption
99 that knowledge is certain and unchanging. Thus, concepts are learned quickly or not at all,
100 whilst learning ability is innate and fixed (Grecic & Collins, 2013). In contrast, a
101 sophisticated epistemological position views knowledge as complex, uncertain, and tentative-
102 learned gradually through reasoning, reflection and construction (Howard et al., 2000).

103 Schommer (1993; 1994) and Schommer-Aikins and Easter (2009) identified five specific
104 dimensions that make up an individuals' epistemological beliefs; i) Omniscient Authority –
105 beliefs about the validity and source of knowledge ii) Certain Knowledge – beliefs about the
106 reliability of knowledge iii) Simple Knowledge – beliefs about the structure of knowledge iv)
107 Quick Learning – beliefs about the speed of learning v) Innate Ability – beliefs about
108 capacity for learning. We share the view that epistemology includes beliefs about learning
109 and is viewed as a system of more-or-less independent beliefs (Elby, 2001; Schommer-
110 Aikins, 2004; Schommer, 1994). These are hypothesised as distinct dimensions that may or
111 may not develop in synchrony (Schommer, 1994) and are best characterised by “frequency
112 distributions as opposed to continuums with extreme poles” (Schommer-Aikins, 2002, p. 78).

113 The extent to which epistemological beliefs remain constant or differ across different
114 domains is a point of debate. Schommer and Walker (1995) suggest that the beliefs of
115 students in education were similar across academic domains. In contrast, Beers (1988), Roth
116 and Roychoudhury (1994) and Mori (1999) suggest that epistemological views were context
117 specific.

118 **The impact of epistemological beliefs on cricket coaching through the epistemological** 119 **chain**

120 Several studies have identified a link between the coaches' epistemology and their
121 coaching practices - this has been termed the Epistemological Chain (EC) (Grecic & Collins,
122 2013). Similar studies in education confirm a strong connection across teachers' beliefs, their
123 classroom behaviours, and the learning environment they create (e.g., Hofer, 2002; Hofer &
124 Pintrich, 1997; Nespor, 1987; Soleimani, 2020; Tarmo, 2016). Findings from studies that
125 have taken place within golf (Grecic & Collins, 2012), adventure sports coaching (Collins et
126 al., 2015) and football (Olsson et al., 2017).indicated that an EC was manifested in the
127 coaches planning, decision making and critical reflection (Figure 1, Crowther et al. (2018).



128 *Figure 1.* Factors influencing coach Decision making (Crowther et al., 2018, p. 69)

129 In showcasing the relevance of the EC framework by Grecic and Collins (2013), it
 130 importantly acknowledges the macro to micro level application of epistemology via six
 131 interconnected stages; i) Environment ii) Relationship Built iii) Goal Setting iv) Methods v)
 132 Judgements Made vi) Future Direction. This framework is relevant for our research given it
 133 incorporates aspects of the coach decision making model (Muir et al., 2011) such as *who* the
 134 coach is working with, *what* the coach is working on and *how* the coach is going to work on.
 135 Finally, it reflects an accepted definition of personal epistemology - that epistemological
 136 beliefs mature at different rates (Schommer, 1994). In drawing this section to a close, Table 1
 137 offers a summary of the EC framework along with the application of increasingly naïve and
 138 sophisticated epistemological beliefs.

139 Table 1. *The Epistemological Chain (EC) of naïve and sophisticated sports coaches (Grecic*
 140 *& Collins, 2013 p.155)*

141

Naïve	Epistemology	Sophisticated
Guru and discipline, rules to follow, autocratic, disciplined, power relationship, dominating coach, compliant athlete, failure to perform is highlighted	Environment	Learning environment created, where athlete can experiment safely without fear of ridicule, two-way discussions and flow of ideas
Transactional, Power roles, dictating behaviours	Relationship built	Trusting, caring, nurturing, autonomy-supportive behaviours demonstrated
Coach prescribed, subjective to coach's beliefs, constant reliance on the coach	Goal setting	Athlete led in discussion with coach
Learn - drill – do, follow set practice regime	Methods	Challenges set for the athlete, creating learning episodes
Success or failure determined by tangible markers or results (e.g. changes in technique, improvement in coach's measure/statistics)	Judgements made	Dependent on how the player develops as an athlete and person with life skills, whilst working towards the athlete led targets. Decisions based on "is the athlete now an autonomous decision maker confident in their own ability?"
Constant coach's revision of targets, technique, results. Coach led modifications to be practiced, re-learned and embedded	Future direction	Future path determined by how self-reliant the player feels. Possibilities include requests for future guidance/mentoring, or removal from the coaching process if it is no longer needed

142

143 Finally, the context for the investigation. Academy level cricket is the final stage(s) of the
 144 player pathway to turning professional. Commonly, a *selected* group of adolescent players
 145 (c.14-18 years old) receive additional support and increased coaching. Players involved in
 146 these programmes turn professional, are released from the academy group and performance
 147 pathway) or remain in the academy context for a number of years. Specifically, academy

148 cricket centres on a stable performance group, an increased control in variables, long-term
149 objectives and extensive intervention and interpersonal contact over a long period of time
150 (Lyle & Cushion, 2016). Fundamentally, the ultimate goal of the academy context is to
151 produce professional cricketers. So, with a focus on the academy stage and reflecting the
152 points made above, we were keen to address our objectives through a careful and triangulated
153 consideration of coaches' beliefs, thinking and behaviours across the two styles of RBC and
154 WBC.

155 **Method**

156 **Research Design**

157 Following ethical approval (BAHSS318) we utilised a pragmatic research philosophy with a
158 focus and emphasis on creating practical solutions to applied research questions (Bryant,
159 2009; Giacobbi et al., 2005). The pragmatic approach was positioned within a relativist
160 ontology and hence, constructivist epistemology. Relativism outlines there are multiple
161 realities and experiences the interpretation of these experiences which ultimately leads to a
162 personal truth (Brownlee, 2004; Guba, 1990). We support the premise that knowledge of
163 reality lies with the social actors who experience it (Blaikie, 2007).

164 **Participants**

165 To ensure depth and quality of data, a purposive sample (Battaglia, 2011) of male cricket
166 coaches ($n=17$) aged 26-45 years old ($M_{age} = 34$, $SD = 7.48$) were recruited. Key criteria for
167 inclusion were, (1) holding a minimum of the national governing body (NGB) 'advanced' or
168 'level 3' coaching award (2) working with high potential cricketers (aged between 12-18
169 years old) or academy level county cricket programmes and (3), having a willingness to
170 examine their own coaching practices. Pseudonyms are used when discussing participants
171 throughout the remainder of the work

172 **Data Collection**

173 Following informed consent, data collection took part in two phases. In phase one, a
174 subsample of participants ($n=5$) were ‘naturalistically’ observed (Mulhall, 2003) prior to an
175 initial semi-structured interview. Interviews lasted between 55 and 90 minutes (*mean*
176 *duration = 72 minutes*) and digitally recorded for later transcription by the first author. A
177 semi-structured interview approach allowed pertinent aspects of the interview to be unpacked
178 in greater depth as they emerged (Adams, 2015). Example questions included; ‘How is it that
179 players become more knowledgeable?’; ‘During your session, I observed that you...can you
180 give me more detail on why you did that?’; ‘How do you know that a player is learning? The
181 researcher followed any developments (i.e. changes) of coaches’ approaches over that time.
182 Follow up semi structured interviews were conducted over the following 12 months (*total n*
183 *= 18*).

184 In phase 2, two semi-structured focus groups (Breen, 2006; Purdy, 2014) (FG, Group
185 1 $n = 8$; Group 2, $n = 4$) were conducted with a different subgroup of participants ($n=12$).
186 These focus groups were digitally recorded and lasted 24 and 28 minutes respectively. The
187 FG was facilitated using five sequential, pre-prepared cue cards to direct the focus (Nicholas
188 et al., 2010) and avoid response bias (Heary & Hennessy, 2002). An overview of the process
189 is presented in Table 2.

190 Table 2. *Example cue card questions used during FG*

<i>Stage</i>	<i>Example Questions/Prompts</i>
STAGE 1	What are your experiences of being coached in red ball/longer format cricket? You may want to consider areas such as the following: <ul style="list-style-type: none">• The ‘goals’ of the coaching – i.e. what were the intended outcomes for you as a player?• The types of practice that you were taking part in. (e.g. technical drill practices, exploration practices, net practice, ‘scenario’ practice etc.)
STAGE 2	I’d like you to think about your red ball coaching. Consider a player that you have worked with in the past...

	<ul style="list-style-type: none"> • What were the ‘goals’ of your coaching with that player? (e.g. what was the point?) • What types of things did you find yourself doing? Saying? How did you go about intervening and/or the feedback process? How did you ‘go about’ your coaching?
STAGE 3	<p>What are your experiences of being coached in white ball/shorter format cricket?</p> <p><i>Repeat process from STAGE 1</i></p>
STAGE 4	<p>I’d like you to think about your white ball coaching. Consider a player that you have worked with in the past...</p> <p><i>Repeat process from STAGE 2</i></p>
STAGE 5	<p>What similarities and differences do you see between the two formats of the game? Why do these happen?</p>

191

192 **Data Analysis**

193 Reflexive Thematic Analysis (RTA) was utilised with the aim to identify patterns across the
194 data sets (Braun et al., 2019). Importantly, the *reflexive orientation* adds a number of
195 important nuances to the analysis process which ultimately increase the philosophical
196 alignment throughout the research process. RTA (underpinned by a ‘Big Q’ approach (Kidder
197 & Fine, 1987), accepts multiple realities and acknowledges meaning is situated. This views
198 the researcher(s) as a valued resource during the process (Braun & Clarke, 2013; Braun et al.,
199 2019).

200 Interview and FG were fully transcribed and the six-stage RTA method was applied,
201 as identified by Braun and Clarke (2013) including semantic and latent aspects of coding
202 (Braun et al., 2017). The final step in the analysis was the creation of ‘storybook themes’,
203 aimed at tying the researchers analytic observations together (Clarke, 2017). Storybook
204 themes engage readers as they explain large portions of the data and importantly, are analytic
205 outputs, grounded in the data.

206 We adopted a relative approach to rigor and trustworthiness (e.g., Burke, 2016; Smith
207 & Caddick, 2012; Smith & McGannon, 2018; Smith et al., 2014). We utilised internal

208 markers of quality such as the experiences and background of both the researcher *and* the
209 reader. Specifically, i) substantive contribution ii) worthy topic iii) rich rigor iv) transparency
210 (Smith & McGannon, 2018). These measures were based on the study's start point, the
211 research environment and the research question (Smith & McGannon, 2018).

212 **Results**

213 Raw data clusters were developed which encapsulated commonalities across the codes
214 assigned through the initial coding process and led to the development of lower order themes
215 ($n=12$). Next, mid order themes ($n=6$) were created, culminating in the storybook themes
216 ($n=2$), i) *get your head down, listen to me and you'll be right; in RBC* ii) *players getting*
217 *stuck in to learning in WBC*. Organising concepts identified by the research team that
218 underpinned the reflexive thematic analysis (i.e., Braun et al., 2019) were; i) Macro level
219 organisational alignment ii) Coaching practice and pedagogy iii) Power relationships in the
220 coaching process. (Table 3).

221 **Get your head down, listen to me and you'll be right (in RBC)**

222 This was created based on three mid-order themes; i) participants as passive recipients ii)
223 players seeking coaches iii) discipline needed.

224 In RBC, coaches viewed players as passive recipients of learning and knowledge.
225 Coaches commonly and proactively *gave* technical solutions to players. Evan discussed how
226 they went about 'equipping' the player with the skill(s) as a result of using a skill de-
227 composition approach:

228 he knows he needs to be able to play off the back foot against seam bowling because
229 he's going to get bounced every time and he's learnt how to pull over the
230 winter...we've just reverse chained that from right, tennis balls, end position, pull,
231 pull, pull to bowling machine, know where it's going to be, start outside the line of
232 the body because that's a bit more comfortable, pull, pull, pull then working on the
233 line of the body because that's a little bit more uncomfortable because when he gets it
234 in the ribs we don't like it to then flicking with an incredi-ball so it was a bit more

235 Table 3. *An overview of the full reflexive thematic analysis*

Examples of Raw Data Clusters	Lower Order Themes	Mid Order Themes	Storybook Themes
Younger players 'don't know their game' Working with the coach to drive practice Learning from (other) experts Coach giving the player technical change Coach leading the technical change (and then player buying in) Technical input decreases as you progress Young players who are able to drive their own practice are a rarity	Knowledge passed down from experts to novice in RBC	Players as passive recipients	Get your head down, listen to me and you'll be right; in RBC
Times where coaches prescribe technique to players Use of sports science to identify the 'right way' Coach instructing based on the demands on the next phase of the pathway	Coach giving technical solutions		
Using experts (recently retired players) to deliver/explore skill sets Using professional players as a reference points Using the expert with real world experience to drive the 'model'	Using experts in the coaching process		
Players needing/wanting coach input Players will come to coaches when they are struggling Players want more structure from the management Good players are the ones who listen	Players wanting/needing coaches	Players seeking coaches	
Consistency of skill (more) important in RBC [Red ball game more technical that white ball] Red ball about longevity, patience and concentration RBC is about discipline [Historical approach to batting] 'bat time, bat all day' Batters get judged more in red ball (no hiding place) More pressure in RBC	Mental requirements of RBC	Discipline needed	

In the past WBC was ‘an add on’, modern day players learn white ball first Attitude to T20 has changed over the last 15-20 years Change in expectations of the players Change in repercussions for players getting out in WBC	Change in attitudes and expectations – breaking with tradition	A culture shift	Players getting stuck in to learning in WBC
Coaches letting players figure out scenarios for themselves Putting players in difficult situations to enable them to learn Players need to figure it out in competition so need to in training too The importance of players ‘finding a way’	Players need to ‘figure it out’	Players take the lead	
Creating situations for players to make decisions about their own practice Individual players responsible for getting something out of it After exploring new shots, players are responsible for their continued progress Players to pick out key learning that works for them	Players have the responsibility		
Learning coming from the players rather than the coach Asking questions might take a lot longer to help players learn but this is ‘better’ Trying to reduce coach input to encourage player learning	Reducing coach input		
Players learning through trial and error Freedom/no repercussion practice ‘Have a go’ practice – Invent something Exposing players to new skills and letting them ‘have a go’	Players learning by ‘having a go’		
Game related practice - more outcome based Using scenarios in WBC Practice with a game outcome (e.g. hit to the boundary) White ball practice with a game ‘angle’ on it	Open/Game related white ball practice		
Specificity of (batting) practice – blocked practice Repetition of shots (in practice) to justify applying skill in a game Increase in specificity in recent history (e.g., ball striking)	Repetitive white ball Practice		

237 variable but he could (have) confidence that actually if he got it wrong it was an
238 incredi-ball not a cricket ball so those sorts of things so he's gone through a process of
239 real breaking it down to start with to its simplest form...to just ramping that up over
240 the period of a winter.

241 Evan is certain of the knowledge that the player *needs* in relation to RBC. The technical
242 solution (known as the pull shot) has clearly been identified as *the right* solution, with
243 coaching approaches used to explicitly allow the player to acquire the required knowledge in
244 a step-by-step manner (i.e. reverse chaining). This idea is well-supported by Stuart who
245 suggests;

246 I think they need direction. So like you say an u14, knowing what is required for red
247 ball training...so I still believe you need to be led. Led towards what a batsman looks
248 like because I think it will be too late for them. Because I think we need to accelerate
249 their learning.

250 In many aspects of RBC, there was an accepted use of discipline specific 'experts' to work
251 with players. This reinforces the players' position and role as *passive* receivers in the learning
252 process. Rob outlines, former, international players as examples of this process, working with
253 players who are developing their batting skills against spin bowling:

254 we'd just try and expand and expand his boundaries a little bit and what he's capable
255 of, then bring in some experts, so (*former international captain*), we got him on board
256 and (*former international player*) who both played spin really well...and they spent
257 time (*with him*) and it's just a case of reinforcing that.

258 The *players seeking coaches* in RBC, reflected coaches' beliefs that it was in fact players
259 who wanted and needed coaches. Rob suggests, "I think they'll come to you because again
260 going back to that example with (player), he's struggling against spin...I'm really struggling
261 can you help me?" Evan indicates that at times it can be those players who are less
262 experienced who will seek out coaches, further supporting the perception that players require
263 technical support from coaches:

264 I suppose his feel for batting is a lot less mature than his feel for bowling so he needs,
265 he's looking for someone to give him some confidence, he just wants a bit of

266 reinforcement, I mean [he's asking himself] 'I feel alright does it actually look
267 alright?'

268 Finally; *discipline (is) needed* in RBC. In this instance, Jimmy clearly highlights the
269 importance of players' psychological characteristics and, more specifically, the discipline
270 required by players in RBC given the increased amount of time required and opportunities
271 available to players:

272 The main difference between red and white ball is the buzz-word 'discipline'. That's
273 always something we come back to, right we've got to hold our discipline or hold our
274 length, whatever it may be. With the bat, bat time, discipline I think that's the big
275 difference between the two forms of the game...the discipline of being able to hold
276 your nerve, your skill for that longer period – that's the main message that most
277 coaches try and get across.

278 Coaches support this as being an important characteristic which can make the difference
279 between success and failure in RBC. This finding supports similar views expressed by
280 Gucciardi and Jones (2012) and ongoing work using the Psychological Characteristics of
281 Developing Excellent (PCDE) (MacNamara et al., 2010). The essence here is the premise that
282 players are required to avoid 'straying from the plan' in RBC. Having explored the findings
283 in relation to RBC, we now turn to the findings in relation to WBC.

284 **Players getting stuck in to learning (in WBC)**

285 This theme was created by three mid-order themes; i) a culture shift ii) learning by having a
286 go iii) players take the lead.

287 *A culture shift*

288

289 Coaches were clear that there had been a change in attitudes and expectations – a breaking
290 with tradition in WBC. As Jason outlined:

291 Fifteen years ago if someone said, off-spinner is on, I want you to go to 6th or 5th leg
292 stump, outside and open up that and it's a freebie if it's at you, if it's at the stumps it's
293 through the off-side then I wouldn't do it but now that's common place because when
294 we first started you'd have thought someone was bonkers for saying that

295 Jimmy considers a players' perspective on the implications of the changes from a wider
296 socio-cultural-political cricket view. Jimmy also considered a macro-level aspect, connected
297 to players' potential career trajectories.

298 The idea of the form of the game has probably changed for players as well hasn't it,
299 so (*in the past*) it was all about the longer form and you've got to be successful in that
300 to get anywhere in the game whereas that's changed hasn't it, the whole outlook of
301 cricket has changed and I think that leads into every other facet doesn't it, whether it's
302 practice or match play

303 What was clear was that these developments were a significant shift in relation to WBC. In
304 working these changes through, this created the opportunity to replicate this, breaking with
305 tradition.

306 *Players take the lead*

307 Coaches discussed how it was important that their players were at the forefront of the
308 learning process, in order for them to 'figure it out'. James outlined a training activity with
309 specified contextual information relating to the state of a hypothetical game providing a
310 purposefully non-pressurised context where players were required, as a stepping-stone
311 towards competition play, to independently complete a batting task.

312 The [training] scenario that we did a couple of weeks ago...the team was seventy for
313 two after twenty, twenty-five overs in a 40 over game and you're chasing 150, that's
314 the target. There wasn't really anything else from us in terms of well you need to do
315 this, you need to do that, it was right, there you go...that's your target, you've got to
316 try and chase your target down.

317 James referred to the cognitive demands associated with players figuring it out, using coaches
318 as a support mechanism. Athletes were encouraged to spend time reflecting, both
319 immediately and sometime after the event, on the skills that were being learnt.

320 I suppose trying things and coaches suggesting different things. I suppose coaches
321 spotting things that might work, or might work better and suggesting it, giving the
322 player the opportunity to try it, to think about it, go away and have a think. . . that
323 kind of thing.

324 Players creating their own knowledge, and learning reflected the notion that they have the
325 responsibility in the process. Evan is discussing the delivery of a white ball coaching session
326 based around different ways to score runs. The coach describes a session which included the
327 explicit identification, by the coach, of a number of approaches; subsequently, however,
328 encouraging players to choose, on an individual basis, the batting skill version to practice that
329 they (i.e., the player) thought was most beneficial to their performance.

330 We went through 8 or 9 different options to the same delivery in WBC against a left-
331 arm spinner running the ball into the batter. So this is what you could do now, you've
332 been exposed to it, seen it, if you take it on and maybe look at spending more time
333 with each individual option that works for you.

334 James articulates the necessity for players to take responsibility regarding the technical and
335 tactical deployment of bowling skills: "rather than say, this is a slower ball, you must be able
336 to do this, this is when you're going to use it [we] let them learn and take ownership of that".

337 Finally, the idea of reducing coach input emerged as a key construct in players
338 creating their own knowledge and learning in WBC. Building from the perceived strength of
339 the coach-athlete relationship, coaches felt comfortable in taking a more hands-off approach
340 to their involvement in player development at times. As an example, Richard explains an
341 expressed understanding of expectations from players with regards to the general coaching
342 approach within the academy: "I think it's very much how I operate. (*At*) Academy level they
343 understand the process, they understand me, they understand hang on a minute, I'm not going
344 to give you the answers, you have to work".

345 ***Learning by having a go***

346 In this theme, coaches were focused on the physical nature of players' attempts at skill
347 learning (i.e. players *literally* having a go!) Reflecting this notion, Rob explained an
348 acceptance, and in fact desire, for errors to be apparent within the development process. Rob

349 outlines: “I want you to be more skilful, I want you to try things, I want you to get stuff
350 wrong, I want him to experiment otherwise where’s our next WBCers coming from?”

351 Coaches reflected on the types of practices at a micro level. Coaches suggested that
352 open/game related practices took place in WBC; however, this was supported by the need for
353 repetitive practice for players to be able to execute their skills in gameplay. Importantly for
354 readers to note, the lower-order theme game related practice is not ‘*games-based practice*’
355 (e.g., GBA; Teaching Games for Understanding (TGfU); Game sense etc.; Kinnerk et al.,
356 2018). It is clear that a range of considerations *of* the game were being made by coaches and
357 players when practicing and that practice was structured in many ways. Sean incorporates
358 both of these themes (i.e., open/game related practice *and* repetitive practice):

359 So I reckon some of mine would be to do with specifically how I might approach the
360 game so a contact drill so I’d often lose focus on contact and try and get balls in
361 specific areas so...there’s no fielders there and just think about...just trying to have
362 good contact, strong contact and then take elements from there and right, now you’ve
363 got those can you now be more specific in your practice in terms of where you’re
364 trying to get those, the gaps or areas you’re trying to hit, whether it’s fours or twos.

365 Stuart supports the use of ‘layering on’ match outcomes (i.e. *game related practice*) when
366 practicing in WBC.

367 we do that thing where you have to get it to the boundary, no fielders but you have to
368 hit it so clean that the ball would go to the boundary, because that’s an outcome isn’t
369 it, that’s hitting it cleanly.

370 Coaches discussed the need for repetitive practice which is positioned in line with the earlier
371 identified theme of breaking with tradition:

372 Sid: Coaching-wise, do you think it’s shot specific practice now? Whole sessions on
373 ramping it, reverse sweeping it.

374 Jimmy: (*Yeah*). And that comes from that acceptance that they are options to be
375 played, I think that probably wasn’t the acceptance years ago. It was right, make sure
376 you bat your 100 balls and you’ll be 85 and now if you’re batting that long you want
377 to be 160 (runs) don’t you.

378 These contentions illustrate an interesting contrast. Whilst modern and innovative approaches
379 to skill acquisition are being used by coaches (e.g., Non Linear Pedagogy), there are times
380 where the use of traditional approaches remain, such as de-contextualised, blocked practice
381 (Shea & Morgan, 1979). Aspects of game play *are* being considered within these practices.
382 Whilst this does not lead directly to changes in practice structure, it is suggestive of a move
383 towards a ‘match-fit’ technique, i.e. technique that is adaptive to the challenges of the
384 performance environment (Chow et al., 2016) in contrast to the fixed technique that is
385 historically sought in RBC.

386 **Discussion**

387 As an important context to the discussion of results, we should stress again that all coaches
388 interviewed were involved in coaching the same group of players, across both forms of the
389 game. In short, any differences between RBC and WBC perceptions are within subject! As
390 such, the data indicate an important and clearly impactful difference in approach across these
391 experienced coaches. The key question is, of course, why this has occurred. The discussion
392 addresses the significant differences in coach epistemology, an exploration of the socio-
393 cultural underpinnings of epistemology and the original contribution our work has made.

394 **Epistemology as red and white!**

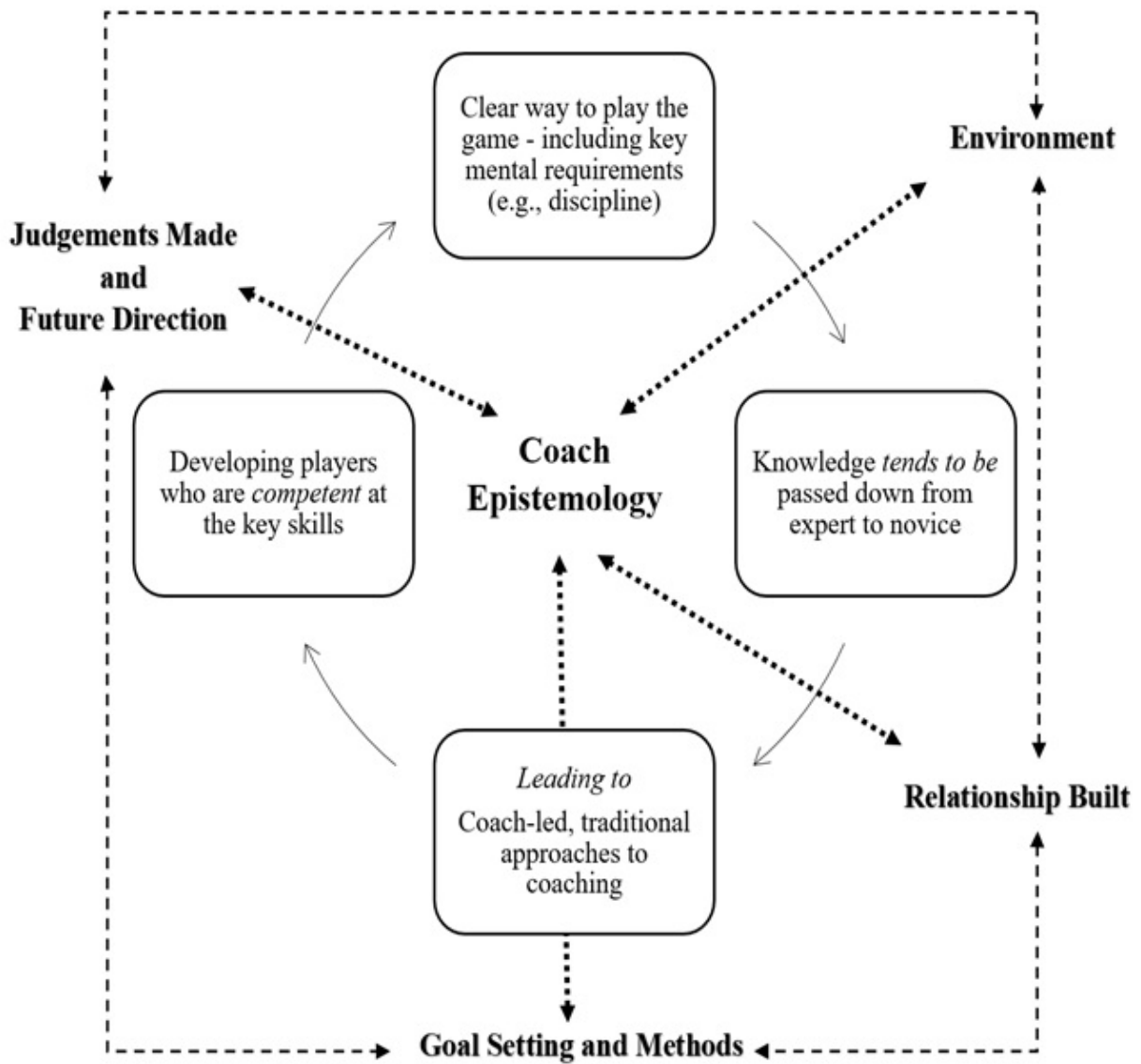
395

396 When coaching RBC, results firmly indicate the coaches engaged in more traditional, coach
397 led practices. In linking to the epistemological dimension of ‘omniscient authority’, coaches
398 increasingly held epistemological positions based on the premise that learning and knowledge
399 in this format was passed down from expert to novice (Schommer, 1994). A second
400 epistemological dimension also came to the fore, that of ‘certain knowledge’. Coaches
401 seemingly viewed there to be one, increasingly unquestioned, black and white approach to
402 RBC, compared to a critical weighing up of options and a personally relevant solution being

403 sought in WBC. Fundamentally, coaches viewed there to be an increasingly right way *to do*
404 RBC (i.e., certain knowledge), and hence passed this down to their players (i.e., omniscient
405 authority). In continuing the discussion in relation to developing players' expertise, the
406 increasingly naïve positions held by coaches across these two dimensions ultimately led to
407 approaches which developed 'competent' players (Epstein & Hundert, 2002). That is, players
408 who were capable of following routines or instructions, as opposed to creating novel
409 solutions to performance problems. These approaches have been challenged when applied
410 directly to those involved in dynamic and interactive sports. The question then is the
411 appropriateness of focusing on players progression towards one, universal 'correct'
412 technique, when players need to execute their skills in highly changeable contexts (Light et
413 al., 2014).

414 In contrast, when coaching WBC, the findings showed that coaches engaged in less
415 traditional (less linear?) coaching approaches, often driven and/or agreed between player and
416 coach. In linking again to the epistemological dimensions, coaches appeared to be viewing
417 the learning process significantly differently from 'omniscient authority' and 'certain
418 knowledge'. In often stark contrast to RBC, these approaches appeared to be aimed at
419 developing expert players (Epstein & Hundert, 2002). That is, developing players capable of
420 creating individualised solutions without a step-by-step guide on how to do so. Coaches were
421 more regularly utilising increasingly cognitive and social constructivist approaches in their
422 coaching. From a cognitive constructivism perspective, coaches were appreciating what their
423 players 'brought to the table'. From a social constructivism perspective, coaches viewed
424 learning as multidirectional, placed similar importance on the role of the coach and the player
425 (Lave & Wenger, 1991) and made learners active in the process (Newmann, 1994).

426 Figures 2 and 3 summarise the coaching process of RBC (i.e., Figure 2) and WBC
427 (i.e., Figure 3) from an EC perspective.



428 *Figure 2.* The epistemological chain and coaching process in RBC

429

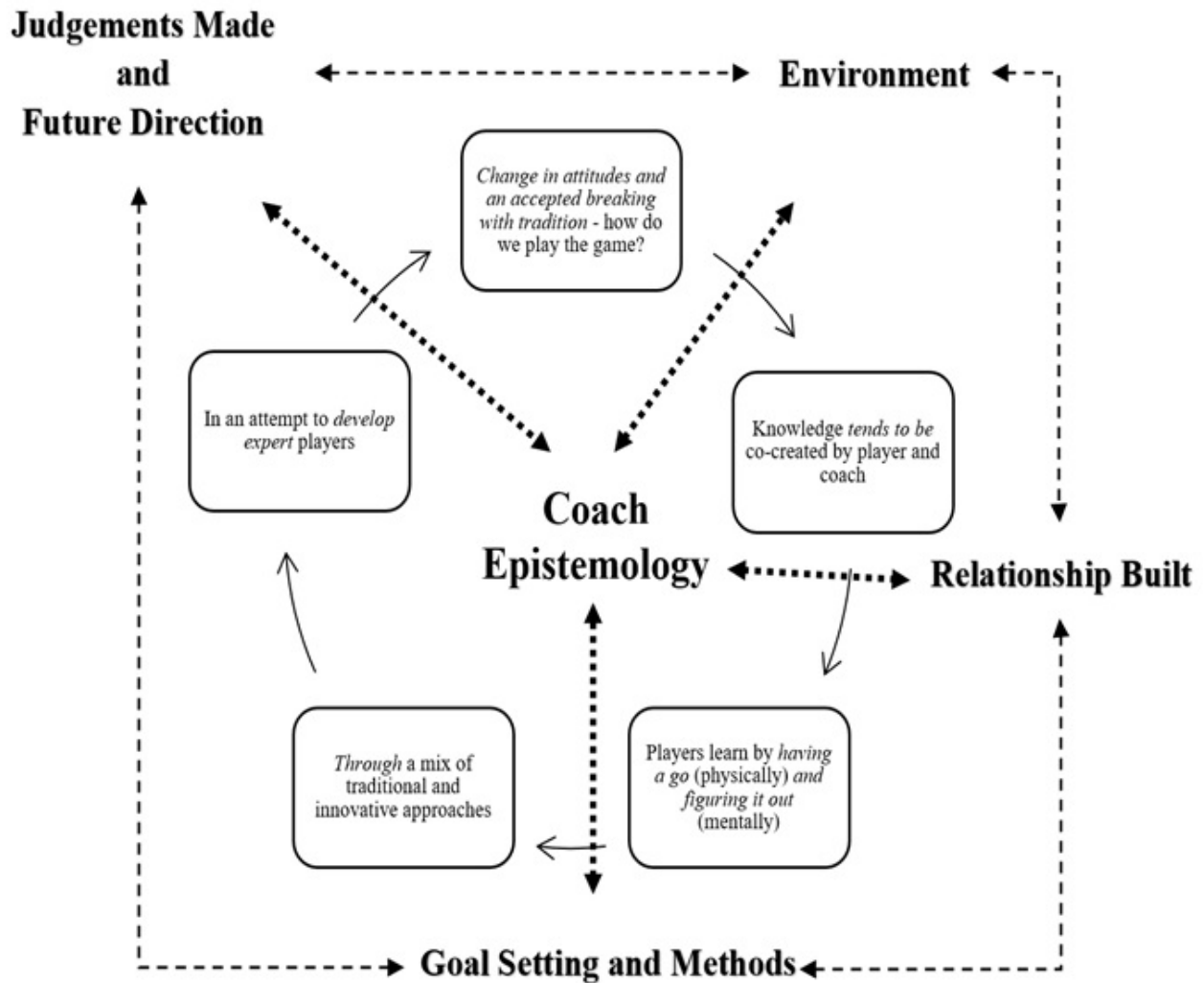
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435 *Figure 3.* The epistemological chain and coaching process in WBC

436 In continuing the discussion, we interrogate the socio-cultural aspects influencing coaches'
 437 epistemological beliefs.

438 **Epistemology as a representation of the socio-cultural context and coach education**
 439

440 In briefly unpacking the development of coaches' epistemological beliefs, there are a number
 441 of areas of consideration. Firstly, epistemological views are said to be developed as a result
 442 of home and education life (Anderson, 1984). Whilst coaches' upbringing will certainly have
 443 exerted an influence, there are also other relevant considerations underpinning coaches'
 444 epistemological positions. Firstly, the socio-cultural nuances underpinning the coaching
 445 context, and secondly, the role of coach education.

446 Our previous work has positioned coaching as a process involving both cognitive and
447 socio-cultural processes (Crowther et al., 2018). Importantly, it is acknowledged that
448 coaching is a non-linear process which involves the challenging and negotiating of contextual
449 issues (Jones & Wallace, 2005, 2006) and that coaches' decisions and approaches are socially
450 contested within temporal boundaries (Jones, Edwards, & Viotto Filho, 2016). Similarly, that
451 coaches' pedagogy is underpinned by a range of sociocultural factors present within the
452 environment (Hardman, 2008). Our attention here turns to addressing a number of these
453 socio-cultural aspects. Importantly, these apply at both the micro and the macro level. In
454 clarifying, the micro level is the coaches' own, individual context (i.e. their
455 organisation/employer). The macro level is the broader 'game of cricket' viewed as a whole.

456 In addressing the micro-level socio-cultural nuances of the coaches' context, one of
457 these nuances is the unique *culture* of their organisation. This is undoubtedly an influencing
458 factor as coaches have been educated in their organisational culture (e.g., Anderson (1984) on
459 the development of coaches' epistemological beliefs). Importantly, each culture is informed
460 by many facets. Examples often include organisational structure, the socio-economic status of
461 the population alongside the cultural position of cricket within each organisation's locality.
462 Perhaps unsurprisingly, these aspects can all influence key aspects of the EC such as the
463 types of environment created and relationships built at the micro level. Continued research
464 utilising an in-depth case study approach would continue to shed light on the specific factors
465 which influence the epistemology of coaches within their individual contexts.

466 In addressing the macro-level socio-cultural nuance, attention turns specifically to the
467 education of cricket coaches. Much has been made of the role of coach education. The
468 question remains regarding the quality of these experiences as *educational* and the extent to
469 which coaches are indeed *educated* or in fact *trained* (Lyle & Cushion, 2016). Issues have
470 also been raised in relation to coach education indoctrinating coaches in set ways of thinking

471 and doing (Nelson et al., 2006). The question then, from an epistemological perspective is; to
472 what extent are cricket coaches simply reproducing the epistemology of their coach
473 education? This can be considered from both the micro delivery of the coach educators
474 delivering course content but also reflecting the epistemological position of the wider
475 cricketing landscape. In being clear and referring to the history books, the first recorded game
476 of RBC was in 1877. The first recorded game of WBC was in 1971. As a result, the perceived
477 knowledge base in relation to RBC is seemingly significantly larger than that in WBC.
478 Consequently, it is perhaps unsurprising that the development of coaches, which although not
479 explicitly labelled, has traditionally and unconsciously focused on RBC principles.
480 Accordingly, the development of coaches has been focused on the reproduction of
481 knowledge. As an important caveat to this historical aspect and referring back to coach
482 educator delivery, this can also occur as a result of coach educators perceiving that to behave
483 in any other manner as a threat to their authority and expertise (Cushion, 2013; Light &
484 Evans, 2013).

485 All these considerations notwithstanding, however, there remains the reality of our
486 data, showing that the same individuals, working in the same contexts, can hold and operate
487 two completely contrasting, even contradictory epistemologies with the same group of
488 players. We would suggest that the driving forces behind these differences (of which the
489 coaches seemed unaware) are more psychological than social. That is more within than
490 between coach. Undoubtedly, the thinking underpinning this key difference is worthy of
491 further investigation. In drawing the discussion to a close, the final section considers the
492 unique contribution our work has made to the existing evidence base.

493 **An original contribution to the literature**

494

495 The findings of the study, and the identification of the inter-connected nature of the two
496 epistemological dimensions; omniscient authority and certain knowledge, extends the
497 previous literature. It has been presented (including at the beginning of this work), that
498 epistemology is made up on five, *more or-less independent beliefs* (Schommer, 1994). After
499 the exploration of cricket coaches' epistemological beliefs in RBC and WBC it seems clear
500 that these two dimensions are in fact connected.

501 The existing literature also presented competing ideas about the extent to which
502 epistemology is similar across domains (e.g., Beers, 1988; Mori, 1999; Roth &
503 Roychoudhury, 1994; Schommer & Walker, 1995). Our findings continue to contribute to
504 this ongoing debate and offer insight into a new context. They strongly suggest cricket
505 coaches hold different epistemological beliefs across different contexts. In exploring more
506 deeply the unique contribution to the literature, there are two distinct differences when
507 considering the findings in relation to the previous research around the similarity of
508 epistemological beliefs across domains. Firstly, our work developed a *richer and thicker*
509 understanding (Schultze & Avital, 2011) of epistemology given the increasingly interpretive
510 approach used. This is in contrast to the predominantly positivist approach much of the
511 research that was actioned by Schommer in the 1990's. Secondly, much of the previous
512 research focused on *the learner*. Our research focused on the epistemological views of those
513 who were tasked with *helping the learner* (i.e. the coach). Whilst this has been starting to
514 take place within other contexts, once again predominantly within education (e.g., Soleimani,
515 2020) there is little evidence of this within sport, and specifically cricket.

516 **Next Steps for Practice and Research**

517

518 There are a number of next steps for both coaches and researchers. The study has had an
519 explicit focus on the epistemology and the EC of individual coaches working with developing

520 athletes. As a result, work would be welcomed which investigates the epistemological beliefs
521 of players within this context. Doing so would continue to add a unique contribution to the
522 existing literature and open up the opportunity to increase the alignment, and hence
523 effectiveness of the coach-athlete relationship, specifically in relation to the learning of new
524 skills.

525 In focusing on RBC, continued work which attempted to unpack the premise of
526 coaches developing *competent* (Epstein & Hundert, 2002) red ball cricketers would be
527 welcomed. There are close links here with other, similar ideas such as developing *docile*
528 players incorporating the perspective of power-knowledge relations (Avner et al., 2021;
529 Denison et al., 2017). As such, exploring this premise, specifically in RBC, through the lens
530 of power-knowledge relations is an area worthy of exploration and has been addressed at the
531 academy-level in other sports (Avner et al., 2021).

532 In offering a final recommendation for practice, our research has worked with
533 individual cricket coaches. It is important however to acknowledge that there are often many
534 coaches who are involved in helping cricket players learn and develop (e.g. a ‘head’ coach,
535 an assistant coach, specialist technical coaches, strength and conditioning coaches etc.)
536 Consequently, there is a clear rationale for the coaching group within each organisation to
537 address the issue of epistemological alignment and misalignment. As opposed to engaging in
538 direct comparison, coaches can become more informed as a result of reflecting on their own
539 beliefs as a result of hearing others around them express their own. We view the unique
540 models of cricket coaching developed within this study (i.e. Figure 2 and 3) to be of real
541 value in this process as a reflective aid. The ambition for coaching teams should(!) be to
542 identify the limits of variation amongst the coaching group and create a clear picture of what
543 is and isn’t going to occur (Webb et al., 2016).

544

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547

Declaration of interest statement

548 The authors report there are no competing interests to declare

549

Data availability statement

550

551 The data that support the findings of this study are available on request from the
552 corresponding author [MC]. The data are not publicly available due to restrictions (e.g. their
553 containing information that could compromise the privacy of research participants and
554 current positions of employment).

555

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