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From early explorers to restricted practitioners: A qualitative analysis of coaches' development, context and practices within UK mixed martial arts

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Abstract

Despite its growing popularity and participation rates, mixed martial arts (MMA) coaching has not been the subject of much critical scholarly analysis. Accordingly, knowledge of this activity is limited, and inadequate, as a means of understanding this MMA context and supporting those coaches who practice in it. To begin to address this gap, we report an initial exploration based upon three interviews with four experienced UK based MMA coaches (12 interviews in total). Via a reflexive thematic analysis we generated four themes: 1) MMA coaches developed their practice via experiential and peer learning; 2) MMA coaches have dual aims of producing competitive athletes whilst appealing to paying, recreational participants. 3) private event promoters dictate competition dates, meaning preparation time may be sub-optimal; 4) MMA coaches rely on 'coach's eye' and subjective feedback to enact practices in relation to training load, fatigue and skill development. Coupled with theoretical sensemaking, this novel exploration reveals MMA practices that are grounded in 'folk pedagogies', and shaped by economic imperatives and powerful actors. These findings provide an original and significant analysis of an increasingly prevalent coaching. This approach supplements existing quantitative training studies, thus enabling a pragmatic understanding of the UK MMA coaching, whilst also providing direction for future in-depth studies.

Key Words

pragmatic; qualitative; combat sports; coaching

30 **Word count:** 10,463 (inc. reference list)

31 **Introduction**

32 Mixed martial arts (MMA) is a combat sport in which competitors use kicks, punches, elbows and
33 knees, along with grappling manoeuvres to overcome their opponent. Participants compete in
34 designated body mass (BM) categories (colloquially termed weight divisions) intended to promote fair
35 and safe competition between opponents of similar physical morphology. Bouts typically consist of 3
36 x 5 mins rounds with variations for professionals and amateurs (IMMAF, 2017; NJSAC, 2002). Success
37 is dependent on a broad range of skills across the striking-grappling spectrum enacted via repeated high
38 impulse actions throughout a contest (Kirk, Clark, Langan-Evans, & Morton, 2020). Despite the sport's
39 development from Brazilian 'vale tudo' (no holds barred) contests of the early to mid-20th Century
40 (Gracie & Danaher, 2003), MMA only became a codified sport following the relatively recent adoption
41 of the 'unified rules' (NJSAC, 2002). MMA has since rapidly increased in popularity and participation.
42 Presently, the International MMA Federation (IMMAF) consists of 100+ national governing bodies
43 (NGBs) across five continents (IMMAF, 2021) with 4,000+ male and female professional competitors
44 ranked worldwide (Fightmatrix, 2022). Studies of MMA athletes (please note - not coaches), reveal the
45 sport is characterised by hyper-masculine cultures (Spencer, 2009, 2014), where bodies are the object
46 of attention and athletes strive to develop themselves as violent instruments. This culture manifests in
47 the sharing of community spaces (i.e., the gym), the purposeful repetition of technical practices, and
48 controlled dieting. Bodies are (re)formed through such practices, and MMA identities are confirmed
49 through embodied competence in competitive bouts. While this extant research illuminates what it
50 means to be a mixed martial artist, little research has explored MMA coaching specifically.

51 The few studies of MMA coaching undertaken to date tend to adopt a bio-scientific approach (e.g.,
52 (Batra, 2019) and have paid particular attention to periodised training structures. Periodisation is an
53 organisational concept that is used to provide periods of high intensity training interspersed with periods
54 of low intensity training to enable adaptation in performance athletes (Kellmann, 2010; Turner, 2011).
55 As researchers, coaches, and performance staff we recognise that periodisation is a ubiquitous term in

56 performance sport. However, UK MMA coaches were recently observed providing a flat loading pattern
57 with no discernible periodisation occurring (Kirk, Langan-Evans, Clark, & Morton, 2021). While it has
58 been argued that periodisation may not be entirely appropriate for all sports or contexts (Kiely, 2018),
59 and we are mindful of the limitations of sport science (Cronin, Whitehead, Webster, & Huntley, 2019;
60 Fullagar, McCall, Impellizzeri, Favero, & Coutts, 2019; Martindale & Nash, 2013), the absence of
61 periodised training prompts us to consider how MMA coaches' practice, and why they practice in this
62 manner. It is here, however, that we reach the limits of extant MMA coaching research.

63 This vacuum of research informed insights on MMA coaching contrasts with the established
64 characterisation of coaching as a complex and dynamic contextualised process worthy of in-depth
65 analysis (Jones, Armour, & Potrac, 2004). Indeed, the coaching research field provides little
66 understanding of MMA coaches, their context, or pedagogical practices. This is remiss as coaches'
67 biographical experiences have been shown to influence their engagement with coach education
68 provision (Callary, Werthner, & Trudel, 2012; Stodter & Cushion, 2017; Wood, Richardson, & Roberts,
69 2021), how they conceive their role (i.e., as a hobby, career or vocation) (Ronkainen, Ryba, McDougall,
70 Tod, & Tikkanen, 2022), and how they plan their career development (Ronkainen, Sleeman, &
71 Richardson, 2020). Additionally, a gamut of sociological perspectives (e.g., Foucauldian, Bourdieusian
72 and Goffmainian) has documented how coaching practices are influenced by contextual factors
73 including power, economic conditions, and cultural norms (Jones, Potrac, Cushion, & Ronglan, 2011).
74 For instance, power flowing between coaches-athletes, micro-political tensions between staff, and the
75 expectations of other stakeholders in the sporting arena have been shown to influence coaches'
76 pedagogical processes. Thus understanding MMA coaches' contexts is relevant because while
77 aforementioned work regarding the training loads experienced by MMA athletes (Kirk et al., 2021)
78 provides an understanding of how this population's training is conducted over time, it does not explore
79 the influences upon this practice. Accordingly, an appreciation of the biographical, pedagogical, and
80 social context is necessary to credibly consider any coaching activity (Day, Loudcher, & Vaucelle,
81 2024).

82 With the above in mind, the aim of this study was to explore the biographies, pedagogies, and the social
83 contexts of professional UK MMA coaches. This exploration is necessary because individuals are
84 increasingly engaging with MMA coaching, yet we have limited understanding of this social activity.
85 In this state there is a danger that MMA coaching will be conceived *solely* through the prism of
86 periodisation and bounded exclusively as a bio-scientific process. This is at best limiting, and potentially
87 inadequate as a means of both understanding MMA coaching and supporting those engaged in it.
88 Accordingly, there is a need to ensure the biographical and social influences on MMA practice do not
89 go unrecognised, overlooked, or ignored. To achieve the aim, we adopt an exploratory approach that
90 recognises coaching as an interpersonal and pedagogical act, situated in spatial, temporal and
91 historically constructed contexts. In doing so, we did not set off to deductively test a-priori theories, nor
92 to provide rushed prescriptions for practice and theory (Jones, 2012). Rather through the experiences
93 of those who know it best (i.e., MMA coaches), we sought to supplement existing literature (Kirk et al.,
94 2021) with an initial and broad biographical, pedagogical and contextual *understanding* of MMA
95 coaching. Via an abductive approach these findings are each accompanied by a sensemaking section
96 that provides a theoretically informed platform to appreciate the complexity of MMA coaching in the
97 UK. This complexity will, of course, need more in depth research and thus, this initial, but important
98 platform, will also direct areas for future research.

99 **Theoretical Considerations**

100 Consistent with the exploratory aim, this study eschews the deductive literary convention of presenting
101 a theoretical framework that guided the study from inception. This is appropriate where there is a lack
102 of previous research theories or findings on a given phenomenon (e.g., MMA Coaching) (Tracy, 2012).
103 Additionally, applying a post-hoc deductive writing structure to research can misrepresent the emerging
104 and generative nature of the research process, obscure the transparency of the analysis, and deemphasise
105 the context at hand (Tracy, 2012). Nonetheless, the aspiration to explore does not mean that the study
106 nor the research team were completely free from theoretical influences (i.e., a 'tabula rasa'). On the

107 contrary, influenced by their disciplinary backgrounds, the team highlight some pertinent and
108 established theoretical considerations here that may be relevant to readers.

109 Firstly, whilst extant studies of MMA coaching have largely focused on physiological informed
110 periodisation coaching in other sports has long been recognised as a pedagogical process (Jones &
111 Wallace, 2006). Here emphasis has been placed on learning with the coach positioned as an educator.
112 Consistent with this view, a gamut of learning theories (e.g., cognitive, behaviourist, constructivist and
113 ecological learning) have been associated with sport coaching practice, on the basis that theoretical
114 informed pedagogical practice can help coaches support athlete development. On a similar basis, albeit
115 often from a different philosophical position, sport science research has used disciplinary specific
116 knowledge (e.g., biomechanical, physiological, nutritional) to inform coaching practice or athlete
117 development (e.g., physiologically informed training methodologies). Thus, (Armour, 2011) recognised
118 that pedagogy in sport coaching contexts can benefit from multiple disciplinary knowledges. It is
119 important to note, however, that coaches do not solely learn from formal education provision nor
120 traditional disciplinary bodies of knowledge be they pedagogical or scientific. Rather biographical
121 experiences as both athletes and coaches have been identified as strong influence on coach learning and
122 practices (Blackett, Evans, & Piggott, 2021; Day, 2023; Jones et al., 2004). Here the 'craft' of coaching
123 in particular contexts is often developed through social interaction in situated environments (e.g.,
124 through social learning, mentoring or communities of practices). Thus, to understand MMA coaches'
125 practices there is a need to understand their biographical development as coaches.

126 Concomitant with informal, biographical, and situated learning, some authors have recognised that
127 coaches may develop 'folk pedagogical' practices (Brammall & Lowes, 2021; Jones et al., 2004). Folk
128 pedagogies are a concept introduced by Olson & Bruner (1996) to describe teacher's personal and
129 preferred pedagogical practices. For example, some coaches may frequently utilise demonstration as
130 part of their pedagogical practice. Reflecting a social constructivist perspective, it is considered that
131 coaches' folk pedagogical practices are underpinned by assumptions about learning. For instance,
132 coaches who view learning as imitation may emphasise demonstration and practice, whereas other

133 coaches may view learning as thinking and emphasise dialogue and debate. Supporting this, Olson & 134 Bruner (1996) suggests the epistemological beliefs that underpin folk pedagogies are derived from both 135 biographical experiences and prevailing cultural norms. Here then, folk pedagogies may, to greater and 136 lesser extents, differ from knowledge generated through scientific and disciplinary processes (e.g., 137 deductive testing, peer review publication). This is because folk pedagogies are inextricably linked to 138 particular biographical experiences and social contexts[1]. Critically, folk pedagogies not only provide a 139 descriptive insight into pedagogical practices, but they also provide a perceptive revealing of the 140 prevailing assumptions about learning, and the norms of a particular culture. This is important because 141 coaching has been shown to be subject to societal influence such as political influences, cultural norms, 142 and economic developments. Therefore, a study of coaching MMA pedagogies should explore the 143 contextual influences upon MMA coaching practices.

144 Thus, literature has established coaching as a pedagogical activity influenced by a wide variety of 145 knowledges, the biographical experiences of coaches themselves, and the social interactions and 146 contexts in which it occurs. In keeping with this prevailing view, the study herein seeks to explore 147 coaching in the UK MMA context. It does so by investigating the biographies, pedagogies, and the 148 social contexts of professional UK MMA coaches. Doing so, provides an initial yet important 149 illumination of this underexamined area of coaching practice, and a platform and focused direction for 150 future research

151 **Methodology**

152 Consistent with the aspiration to explore, a qualitative approach was chosen to provide in-depth 153 analyses of the biographies, social contexts and practices of professional UK MMA coaches. As part of 154 a wider project we sought to pragmatically (Yardley & Bishop, 2017) understand and analyse MMA

[1] An interesting point here, raised by a reviewer, is that conceptually folk pedagogies have similarities to indigenous pedagogies which are also culturally and historically situated. This does not mean that all folk pedagogies are indigenous pedagogies. This is because indigenous pedagogies are particular to indigenous communities with ancestral ties to particular geographies, social practices and knowledge systems.

training practices. Within this particular study, we were informed by a relativist ontology, which appreciates the particular subjective experiences of coaches. Here coaches' perceptions are not seen as separate to a universal external reality i.e., experience of a reality. Rather the subjective human experience *is* reality for them. In this way, we recognise that there are multiple ways of experiencing MMA *relative* to coaches' biographies. We also embraced a subjectivist epistemology that sees knowledge as laden with values, beliefs and cultures. Related to this we were mindful that individuals are always situated in a wider spatial, temporal and relational world which means that here is a need to see knowledge generated in context. Together these philosophical tenets led us to examine previously unexplored phenomenon i.e., MMA coaches' biographies, contexts, and practices. In concert with previously reported quantitative observations and realist studies of MMA (Kirk et al., 2021; Uddin, Tallent, & Waldron, 2020), this exploration enables a more complete understanding of the MMA training process from a dialectic stance, whereby the results from different approaches are brought into 'dialogue' with each other (Schoonenboom, 2019).

Participants

Following institutional ethical approval (20/SPS/033), participants were recruited via purposeful and criterion-based sampling from the wide network of coaches known to the research team (Sparkes & Smith, 2014). The following criteria were used to ensure participants that could illuminate the biographies, practices and social contexts of professional UK MMA coaches: current head coach of an MMA club; must plan and coach a minimum of five MMA training sessions per week to demonstrate an active involvement in MMA athlete development; coaching female and male adult competitors; a minimum of ten years involvement in MMA training; a minimum of five years of coaching national and/or international competitors, at professional, amateur and developmental levels. Four participants with substantial experience of the phenomenon in question (i.e., MMA coaching) were recruited. All participants provided informed, signed consent prior to the start of the interviews, and were assigned a pseudonym (see Table 1).

Table 1 – Participant details

Pseudonym	Age	Sex	Years involved in MMA	Years involved in MMA coaching	Former/Current MMA athlete?	Formal coaching/sports education?	Sport specific qualifications?
Ian	40-50	M	~25	~22	Y – international professional, retired	N	Kickboxing coaching; BJJ black belt.
Steve	30-40	M	~15	~10	Y – international professional, current	Y – BSc (Hons) Sports Coaching	BJJ brown belt.
John	50-60	M	~30	~25	N	N	BJJ black belt.
Mark	40-50	M	~20	~15	Y – regional professional, retired	Y – BSc (Hons) Sport Science	N

Nb. M = male; Y = yes; N = no; BJJ = Brazilian jiujitsu

181

182 **Data Collection**

183 To achieve the aim of exploring the biographies, pedagogies, and the social contexts of professional
184 UK MMA coaches, each participant took part in three separate interviews lasting 40 - 80 mins each
185 (mean = 47.3 ± 7.5 mins), via Zoom video chat software (Zoom Video Communications, USA).
186 Multiple interviews allowed: sufficient rapport to develop between the lead researcher and the
187 participant; detailed discussions to take place without the fatigue of one extended interview; responses
188 to be reviewed for areas to probe further and revisit between interviews which thus enabled rich data to
189 be generated (Smith & Sparkes, 2016). Interviews were semi-structured and consisted of open and
190 neutral questions informed by training literature (Kirk et al., 2021; Uddin et al., 2020) and practical
191 experience of the lead investigator. The interview questions can be viewed in Supplementary File 1.
192 We designed questions to focus on the following themes: participant's background in MMA ; their
193 transition into coaching; their current practices in coaching competitive and recreational MMA
194 participants. These broad topics have been recognised as important in coaching literature albeit not in
195 MMA (e.g., Jones, Armour, & Potrac, 2004; Blackett, Evans, & Piggott, 2021). They were shared with
196 the participants prior to the first interview taking place. A pilot interview was undertaken and reviewed
197 by the team to ensure questions were effective. This resulted in further probing questions being asked
198 in the interviews. The coaches' responses were reviewed following each interview with notes being
199 made about which areas to probe further, which questions to prioritise in the next interview, and which

200 theoretical topics may be relevant to participant's responses. This approach was chosen to achieve the
201 aim of the study (i.e., to explore the biographies, practices and the social contexts of professional UK
202 MMA coaches).

203 **Data Analysis**

204 We completed transcription of interviews (excluding the pilot) using Otter.ai transcription software
205 (Otter.ai, Los Altos, USA) followed by manual correction of errors. All data were stripped of identifying
206 information and analysed via reflexive thematic analysis, which enabled us to identify patterns from
207 our relativist and inductive viewpoints (Braun, Clarke, & Weate, 2017). To do so, segments of text that
208 were determined to be meaningful to the research aim were initially coded into categories by the lead
209 researcher. Each category was discussed with the second author and potential themes were developed.
210 Via PowerPoint each potential theme and associated data was shared with the wider team who initially
211 compared themes and data. This primary coding cycle, was subsequently followed by a secondary cycle
212 (Tracy, 2012). Here the first author revisited data and recategorised some data. This led to refined
213 themes that were again presented to the wider team. Through critical conversations over a number of
214 weeks the themes continued to be refined to provide account of MMA coaches' biographies, context
215 and practices. During this secondary coding cycle (Tracy, 2012), theoretical explanations were offered
216 by research team members, and critically considered for a sense of verisimilitude (Burke, 2017).
217 Reflecting the relativist ontologies of the team, the inductive methodology, the dialectic approach to
218 existing literature and the subjectivist epistemology, we embraced a range of theoretical insights as part
219 of sense making. Some of these insights (e.g., training theory and folk pedagogies) inform the
220 discussions that come.

221 Throughout the analyses , researcher subjectivity was taken into account as an important part of the
222 process, and in keeping with a reflexive approach (Braun & Clarke, 2013b) we were mindful of our
223 existing experiences. Specifically, the first author has extensive first-hand experience of participating
224 in MMA training in the northwest of England whilst also studying the physical training of MMA
225 athletes. These experiences enabled the lead author to recruit an experienced sample, develop rapport

226 with the participants, and to understand culturally specific terminology and practices. The wider team
227 (4 other authors) has an array of experiences not rooted in MMA, but which nonetheless prompted
228 reflexive discussions and added value to the study. These include international experience as a combat
229 sport athlete and coach, international experience as performance scientist, and experiences as coaches
230 in sports other than MMA. All authors have substantial research profiles having conducted qualitative
231 research in both sport coaching and sport.

232 To ensure rigor and credibility during these analyses, the following processes were conducted
233 throughout: 1) the lead author maintained reflective diary entries throughout the interview and analysis
234 stages. These were used to record thoughts and decisions, critically manage subjectivity, and inform
235 approaches taken during each interview and the coding process; 2) each participant was provided the
236 opportunity to review and comment on the interview transcript prior to coding, which resulted in minor
237 errors in syntax and participant emphases being corrected; 3) each stage of data analysis was subjected
238 to peer debriefing by the research team as critical friends (Smith & McGannon, 2018). In short, the lead
239 author identified quotes from each participant that appeared to be thematically related to each other.
240 These quotes were organised into preliminary themes and presented to the other members of the
241 research team for critique, scrutiny and debate. The team drew upon their varied perspectives to
242 challenge the analyses conducted by relating findings back to the raw data and interrogating analysis
243 from their own viewpoint. An example of how one potential theme was initially presented to the
244 research team can be viewed in Supplementary File 2. The collaboration sought to develop a nuanced
245 reading of the data embedded with reflexive consideration (Braun & Clarke, 2013a; Burke, 2017).

246 **Findings**

247 The findings are presented via a layered analysis that includes a thematic map, introduces each theme
248 via data and narration, and includes our theoretical sensemaking. As readers engage with these findings,
249 we recognise that they reflect the experiences of particular UK based MMA coaches and discussions
250 are guided by our own subjectivity. Alternative perspectives may generate different readings and
251 reporting of the findings. Nonetheless, we have undertaken a clear process to ensure rigour within the

252 analysis and as part of that we encourage readers to act as critical 'connoisseurs' (Sparkes & Smith,
253 2014) when considering the transferability of findings to their own context (Smith & McGannon, 2018).
254 Thematic analyses of the interview transcripts generated the development of the following four themes.

255

256

257 **Theme One – 'Evolving coaching in a developing world'**

258 *Early experiences*

259 The MMA coaches in this study evolved their knowledge and practices in an 'developing world'. Ian,
260 John, and Mark, the older MMA coaches, became involved in MMA during the 1990s and early 2000s
261 through a general interest in 'traditional' martial arts. In the absence of a formal club or participation
262 structure, these coaches reported travelling to different groups of people as a means of learning while
263 John "made the decision to go out to America and train full time" at the age of 21.

264 Ian: "I went down out of interest…Started with that club trained with them, and sort of fell in
265 love with it and started training twice a week, and it was three times a week then it was four
266 times a week, trained with him for about probably about two years and then he closed. I wanted
267 to take it a bit further so I sought out the local - well it wasn't local it was an hour away - the
268 best fight team in in probably the north-west at the time, you know, there wasn't many, in fact
269 there was one"

270

271 By the time Steve, the youngest of the coaches, engaged with MMA, the need to travel was less, because
272 MMA was more established as a sport in the UK. MMA clubs were available in his local area and local
273 competitors were 'known' in their regions. Through their informal networks, each coach learned the
274 techniques of MMA, shared ideas between training partners, and recreated the competition format in a
275 seemingly ad hoc and unstructured manner.

276 Ian: "The setup was a lot different back then. There wasn't a head coach. There was no one in
277 charge of the team. We were all just at the same level mixing our knowledge together. So it'd
278 be like, 'Ian you know some boxing, you run a boxing session tonight. Yeah, Alan, you're really
279 good at the ground part you run a ground session tonight'"

280 John: "...because people really didn't know how to train back then that much……The MMA
281 training that we did was either sparring, or it was like wall wrestling rounds, that sort of thing
282 really. But every day was full on intense. Very intense…we used to call them bloody Mondays

283 because they were very, very intense sparring… sort of an old school method really… Who's
284 got more that day? Basically it was that sort of training."

285

286 *Entry to Coaching Careers*

287 As the sport evolved through informal learning, the participants experienced one of two motivations for
288 becoming a coach. Ian and John expressed being drawn to coaching as a natural progression from their
289 own competitive career.

290 Ian: "It seemed like it was a natural progression from athlete now move across to coaching…It
291 appealed to me anyway because I always felt I had a lot to pass on…and it was towards the end
292 of my fight career that I sort of said 'right, I'm going to set up my own place and concentrate
293 on that, rather than myself as an athlete now'".

294 John: "I was [training] in America, some of the guys commented to me a few times that they
295 thought I was good at doing that already. So, it just was just naturally in me to sort of take the
296 lead on running stuff."

297

298 In contrast, the other two coaches appear to have seen coaching as a financial opportunity either for
299 their own livelihood or to support their own training. Indeed, over time, Mark realised "I could take it
300 a little bit more seriously now, you know what I mean? I could actually eventually be able to make a
301 living out of coaching".

302 *Coaching Knowledge*

303 As they developed coaching careers, all the coaches learning continued to be grounded in experiences
304 and ideas shared between training partners and clubs.

305 Mark: "My coaching was anything I learned on the Tuesday I taught on the Wednesday. And
306 then there was a couple of guys I knew that were starting something in {NEARBY TOWN}
307 and they asked me to do a bit of coaching from there and said, 'Yeah, no problem'. And so I
308 brought some of the guys from {CLUB TOWN} to {NEARBY TOWN} and we had sort of a
309 joint class going on."

310 Importantly, Steve is the only participant who reported being influenced by any formal coach education.

311 Steve: "Before I had a coaching degree I'd assess my class on what I taught, so I could already
312 assess how well the class went before I'd taught it based on how good I thought the session plan
313 was…. It *[the degree]* was all lightbulbs were going on for me, like I was a coach who used to

> queue kids up for pads, d'you know what I'm saying? I now know what bad coaching looks like, … So, you know, I've done it all wrong, but I didn't know I was doing it wrong."

Steve's formal coach education may be particularly helpful because the coaches expressed that as they became more established as MMA coaches, less sharing of knowledge has taken place.

> Ian: "There are some coaches that think it's all secret techniques, and they won't be sharing with you.….early on, it was very much: share, and I think probably as it's got bigger it has got a little bit more political."

This reduction in external peer learning is strongly reflected in John's assertion about not requiring external information or assistance, stating his own experience and in-house colleagues are all he requires:

> John: "I've enough experience to know when I don't know something and to go and find out and ask…but, do I have to go and ask an MMA coach advice about MMA? Very, very, very rarely ever…. I don't need anyone. I'd rather play off my coaches and us work together on stuff than do that."

Mark is less restrictive in his approach to external development but still does not appear to engage with other coaches, preferring technical tutorial videos and popular science books: "I'll read like The Talent Code and Bounce and things like that."

Summary

The biographies of these UK MMA coaches reveal a generation of 'early explorers' who acquired relevant knowledge through experiential and peer learning without formal coaching being available. The infancy of MMA during this period required the participants to explore training, competition and practice techniques alongside each other and share as much knowledge as possible. This became more organised during the early years of the sport's existence in the UK, with coaches 'falling into' their roles. Steve, the youngest of the coaches who found MMA several years after the others, somewhat benefitted from this more structured coaching in his position as a developing athlete learning directly from an 'early explorer'. This illustrates genealogy of coaching practices being developed within MMA, similar to what is seen in other sports (McCullick, Elliott, & Schempp, 2016).

Theoretical Sensemaking; Folk Pedagogies

343 As demonstrated above the 'early explorer' coaches travelled to environments where MMA cultures
344 were more developed or developing. Here they accessed pedagogical practices enacted by those MMA
345 coaches. Upon their return to the UK and reinforced through peer and experiential learning, the coaches
346 themselves promulgated similar coaching practices. For us these accounts reinforce our understanding
347 of coaching as a biographical influenced pedagogy and is also reminiscent of folk pedagogies. Folk
348 pedagogy suggests a practitioner's theories of learning are based on their personal experiences as a
349 learner (athlete) and teacher (coach). These experiences are processed through the norms of the culture
350 in which they exist, and through interaction with their peers within said culture (Olson & Bruner, 1996;
351 Partington & Cushion, 2013). Thus, the coaches in this study were both the recipients (as coaches and
352 athletes) and disseminators (as coaches) of MMA folk pedagogies. In doing so, the coaches appear to
353 have developed their pedagogical practices through grounded cultural experiences, and furthermore, as
354 experienced practitioners, continue to exemplify these practices. Specifically, normative coaching
355 practices may be observed and acquired by athletes who subsequently develop as coaches, a lá Steve.
356 In this way, coaching methods, activities, and behaviours are reinforced across subsequent generations.
357 Indeed, Spencer (2009) reports how through mimesis, training techniques are repetitively 'parroted' by
358 US MMA participants to the point that they are pre-reflexively embodied. Thus, illustrating the power
359 of folk pedagogies as a socialisation processes.

360 **Theme Two – MMA coaches as club owners: 'Constrained early explorers'**

361 Each of the coaches in the study progressed from being an early explorer to becoming owners of
362 independent MMA clubs. This ownership both enables and constrains their coaching, which
363 simultaneously; i) provides a viable income; and ii) ensures their athletes are able to compete. These
364 potentially conflicting aims require coaching practices that meet the perceived needs of both the paying,
365 recreational members, and those with competitive aspirations.

366 Steve: "So at the gym now we've got an intro to MMA, an intermediate's and advanced….
367 Every level is equally important. So, I wouldn't say there's anything more important, we're
368 trying to be family martial arts meets American Top Team *[elite international MMA gym]*….
369 we might be a bit more passionate about fighting because it's competitive, but if you come in
370 the gym and you look at the way the structure works you got them coming in at 4 *(years old)*,

371 working them up through the fundamental movement skills into the juniors, you know,
372 progressing on to being young adults."

373

374 John and Steve are able to employ younger coaches to lead recreational and beginner classes, leaving
375 them to focus on the 'fight team' sessions. Ian also expresses a desire to do this, but the economic
376 context of being a club owner precludes it.

377 Ian: "Priority as a business owner, are your paying members…you've gotta look at *(what)* 80%
378 of our paying members want - they are there as a recreational activity. You're stupid if you then
379 model your business to the 20%. You won't be around very long. And that's the reality of it.
380 Now, the enjoyment is probably at the 20%."

381 Mark: "if I just focussed on out and out fighters, I wouldn't be able to put food on the table".

382 Steve: "if we started to prioritise the fighters, other stuff will go to shit…If we don't have the
383 paying customers coming in we can't run the gym anyway."

384

385 To meet the needs of their recreational participants, the coaches utilise a warm-up based around
386 narratives of raising the heart rate (HR) and breathing rates. Coaches also reported using mobility drills
387 as part of a warm-up. The main session structures are typically based around drills with a focus on
388 specific combat techniques, performance specific skills, with 'live' drills and sparring being
389 incorporated towards the end, often as a method of 'conditioning'.

390 Steve: "I always aim for a minimum of 15 minutes live. So the easiest day you'd get is drill for
391 like half an hour, 40 minutes and I go live for 15 minutes. I feel that's the lowest level of
392 intensity I'd go for is 5 x 3 *[minutes]* jiujitsu with punches. A more intense session will be shark
393 tank rounds so you're in a three…winner stay on. So the fittest guy will end up probably doing
394 the most time in."

395

396 According to Steve, such sessions takes place "two to three times a week" and aspire to improving skill
397 and fitness for athletes, whilst also being enjoyable for paying members. Reflecting the balance between
398 the needs of recreational and competitive club members, John discusses how "there's stuff that everyone
399 needs to do…(and there are) intricacies that we've noticed that the higher-level athletes needed". The
400 challenge for John and the other coaches in this study, is to plan sessions such that the intricacies needed
401 by professional athletes are either "implement*(ed)* into our amateur team" or provided in supplementary,

402 resource intensive, training. Thus, being a club owner, both enables these coaches to support athletes as
403 full-time coaches with the recreational club members 'keeping the lights on'. This also somewhat
404 constrains their practice due to the required provision of a dedicated service for these paying,
405 recreational participants.

406 **Theoretical Sensemaking**

407 Preparing athletes for bouts whilst ensuring paying members are satisfied with their experience means
408 the coaches exist simultaneously across four coaching 'domains' (beginner, participation, talent and
409 high performance) (Duffy et al., 2011). This is similar to other sporting contexts where coaching across
410 domains may help coaches develop economically sustainable careers (e.g., in some jurisdictions, tennis
411 coaches may work with high performing athletes such as doubles players, but also provide personal
412 coaching to club members). In this study, the MMA coaches respond to the participation and
413 performance demands by designing training sessions that incorporate the skills they believe are required
414 in MMA competition, with those that recreational participants may also find beneficial or enjoyable.
415 Thus, the economic imperative provides a stimulus to develop and maintain pedagogical practices,
416 including standardised session structures focused on coach led drills and exercises which participants
417 repeat, before concluding sessions with more dynamic and high intensity 'live' sparring sessions. The
418 persistence and use of these practices across the sample of coaches suggest that this 'folk' pedagogy is
419 an effective method of serving both participants' competitive and coaches' financial needs. This is an
420 important insight because whilst a small corpus of literature has explored influences on coaches'
421 incomes such as gender disparity (Wicker, Orlowski, & Breuer, 2016), little research has explored how
422 coaching practices are impacted by economic conditions (e.g., salary). Addressing this gap, our findings
423 show how coaches have developed training methods in direct response to their economic conditions.
424 Indeed, these coaches appear to have an understanding of "professional intentionality, progression (of
425 self, others, and context) and agency" (Jones, Corsby, & Lane, 2024), which has enabled them to
426 develop sustainable coaching careers in a challenging economic context. Such understanding may be
427 valuable to many coaches in the UK coaching landscape which has depicted a developing profession

428 consisting largely of volunteers, some part-time coaches and few full-time coaches (Taylor & Garratt,
429 2010; UKCoaching, 2023). That said, in developing economically sustainable coaching methods it
430 could be the case that performance athletes are unlikely to receive the required physiological stimuli
431 (Kirk et al., 2021; Uddin et al., 2020). Equally, recreational participants taking part in potentially
432 monotonous drill activities that by nature carry a high injury risk (Ji, 2016) may not persuade them to
433 continue their membership for long. Indeed, Ian and Mark, in keeping with Jones et al. (2024) work
434 using Heideggerian phenomenology, allude to a compulsion to authentically coach performance athletes
435 which is accompanied by a realisation that for this to happen requires coaches to work with participation
436 athletes and to work with them well. For these coaches then, while the optimal training for either
437 performance or recreation athletes may involve different structures and methods, and should always be
438 considered, the 'being of MMA coaching', necessitates that these coaches authentically acknowledge
439 the need to do both performance and participation focused coaching, sometimes even simultaneously.
440 This is an area that those who support coaches, either through research or education, may need to
441 consider.

442

443 **Theme Three – 'Training camp dictated by external factors', and tangentially influenced by**
444 **scientific training principles.**

445 As they approach competition, competitive MMA fighters will experience coaching in a 'training
446 camp', whichis the extended, more focussed training time spent preparing for a specific competition.
447 This is the traditional format for combat sports competition preparation, and an integral part of the
448 athlete's and coaches experience (Uddin et al., 2020). The time provided for this preparation period is
449 influenced by the date of the competition, which the coaches state is predominantly decided by the event
450 promoter. This period can vary but will be used for purposeful training with specific aims related to an
451 upcoming competitive bout. The coaches in this study reported that they typically focus on achieving
452 the target body mass (BM) of the athlete, improving their levels of fitness, and enhancing the skills
453 athletes require for the given opponent.

454 Steve: “{FIGHTER D} comes in and there's a fight there in seven weeks, right? Well, we've
455 got seven weeks. If it's a bit earlier, maybe you know, maybe in November, you say ‘right, this
456 next show's in April? Well, we've got twelve weeks.’ So we always look at the situation when
457 is this show, or when is this fight being offered….if he’s got six weeks, sound let’s go.”

458 Mark: “The first initial part we'll look at the opponent….so we've got something to go on from
459 a technical point of view and a tactical point of view. And then it's just about getting my fighter
460 in shape so eight weeks, start off trying to get them as fit as I can, as early as I can. (If) his
461 fitness base is poor, then I need a bit more than eight weeks really”.

462 Ian: “I tend to plan (for) that eight to ten week period. Where do you get your eight to ten weeks
463 from? That's just the standard that goes around, there's probably no actual scientific evidence
464 behind that! [laughs] Some do twelve some do six.”

465

466 To focus on the last quote above, Ian acknowledges that the length of a training camp can vary due to
467 the influence of external event promoters. He also recognises that there is an accepted ‘tradition’ within
468 MMA and that this may not be informed by scientific evidence. In contrast to this tradition, Steve
469 somewhat provides a scientific rationale for his approach to camps.

470 Steve: “I like a linear twelve weeks early prep, eight week camp, seven weeks is training. For
471 that ten weeks (sic) we're looking at that bell shaped curve, I like that sort of approach… If he's
472 got six weeks, sound let's go. Let's just let's just hit that bell shaped curve now.”

473 In this instance, whilst Steve doesn’t provide any detailed explanation as to which training variables are
474 subject to the “bell-shaped curve”, or how they are manipulated, he does highlight that “it's about
475 making sure he's not just doing too much volume all the time and not enough intensity, and not enough
476 sport specific stuff”. Steve’s rationale for such action is reminiscent of periodisation theory and perhaps
477 reflects his experiences formal coach education (see Theme 1).

478 Within the varied time lengths of a training camp, the coaches in this study expressed how they would
479 focus on specific skills that their athlete needs to improve, at the same time as developing fitness. For
480 instance, Mark emphasised the importance of training while fatigued.

481 Mark: “Now I try and (use) more of the HIIT, try and focus on getting the heart rate really high
482 and sort of replicate what it's like in a fight really….quite often, we'll do a pre-exhaust where
483 they'll tire themselves fully out and then they've got to fight or they've got to spar or they've got
484 to roll in that fatigued state.”

485 Similarly, Ian described overloading technical/tactical drills with sparring to provide intensity and to
486 demonstrate improvements in technique and/or fitness.

487 Ian: “It's usually done through drills and live drills. So if I want you to use your underhook to
488 get off the wall and then hit your own takedown…it'll be done under no resistance, work what
489 you're comfortable with and then usually go 'right let's do some resistance drills on that as
490 well’”.

491 Such approaches could be somewhat justified with training theory but once again it was interesting to
492 note that, only Ian articulated a pre-competition taper where “the last week it's very, very light, and we
493 won't do much really”. Indeed, again demonstrating variation in their approach to training camps, John
494 questioned the utility of such camps and declared based on his experience, “the people that are going to
495 make it are the ones that stay ready….I know he’s ready to go with three weeks time. He's a professional
496 athlete, he takes care of his stuff”.

497 **Theoretical Sensemaking**

498 Reflecting another economically necessitated compromise, the time duration provided for training camp
499 appears to be mostly dictated by the event promoter. Specifically, these coaches’ experiences illustrate
500 a wide variation in training camp structure and format, with little consensus regarding approaches to
501 competition preparation. That said, these coaches reveal it is common for this time to be shorter than
502 desired. Indeed, twelve weeks has precedence for use in MMA (Jukic et al., 2017) and equates to the
503 suggested time for improvement of MMA athlete bio-motor abilities (James, Kelly, & Beckman, 2013;
504 Mikeska, 2014). In the absence of this duration being provided, training camps become more focussed
505 on providing ‘sharpness’ and achieving the required competition BM. Athlete preparation is therefore
506 more reactive than proactive, with the coach responding to the power of promoters to set dates. This
507 scenario reflects the influences of external promoters, evolving MMA traditions, and to a lesser extent,
508 scientifically informed training theories. It also demonstrates that as Cronin & Armour (2017) highlight,
509 coaching does not *only* involve the development of a corporeal excellence, but requires the craft of
510 working with others to do so. Specifically in this case, MMA event promoters are powerful key
511 stakeholders. Thus, while extant research on MMA coaching may encourage coaches to adopt evidence
512 informed 12-week periodised training camp incorporating purposeful overload and tapers, our study
513 reveals that to adopt such practices, coaches may need to work alongside event promoters to navigate
514 and orchestrate (Jones & Wallace, 2006) their practice. Doing so may not be easy, given the economic

515 power of promoters, the prevailing norms in the context (see theme one), and the need to maintain a
516 sustainable coaching career (see theme two). Specifically, coaches may be incentivised to work
517 compliantly with event promoters to organise ‘timely’ bouts for their competitive fighters. Thus a
518 coach’s reputation could be harmed if they do not work well with these powerful promoters to provide
519 sufficient preparation time. In turn, this could influence their ability to attract more fighters and even
520 their reputation as coaches amongst recreational participants. Whilst other studies have explored the
521 relationships between coaches and athletes, parents and fellow coaches, this study suggests there is also
522 value in studying the relationship between MMA coaches and promoters.

523

524 **Theme Four – ‘Monitoring of training load and responses is subjective’**

525 Building on the notion of purposeful overload (described above), the coaches understood that
526 training load needs to be modulated during a training camp. The nature of the training environment and
527 the focus on their own practice means they attempt to achieve this via altering the intensity or content
528 of technical/tactical sessions. The coaches reported assessing the effects of training on athlete’s
529 physiological and skill performance through informal, day-to-day observations during training sessions.
530 For example, Ian demonstrates the importance of assessing training load by explaining that “they’ll *(the*
531 *athlete)* break because they’ve never been put under pressure. But then if you put under them too much
532 pressure they break because they’re now overtrained”. Coaches in this study attempted to achieve this
533 balance by altering technical/tactical sessions using a process Steve calls “tactical periodisation”. This
534 involves “working at 80%, an amber session” early in a camp before later increasing intensity. Mark
535 also suggests his chosen training methods change in relation to the competition date where “the last
536 couple of weeks I’ll do a lot of escapes from positions and submissions…we’ll do some extra stuff for
537 the guys who've got fights coming up, and then the fitness work and stuff like that, we'll set it and
538 sometimes they’ll do that outside the class time”. Ian discusses his understanding of intensity within his
539 sessions.

540 Ian: “I don’t think of it as intensity probably, I think of more in the sense of when am I going
541 to introduce sparring, which obviously will be more intense. Now it isn’t me thinking I want it
542 to be more intense, it’s the fact that I now want you to get fight sharp.”

543 Each of these discussions include the use of terms that suggest the coaches are cognizant of some
544 training load management theory.

545 Ian: "You're getting closer and closer to competition so it should become more, more and more
546 competition specific…*(They)* call it the GPP I think don't they? It's just becoming more sport
547 specific, less general more sports specific…becomes more and more close to what you're
548 actually going to be doing on the night. That's why the sparring gets introduced then, my
549 thought process has been any way to try and take them into right 'now we're ready, now we
550 put everything in that we worked'."

551 Despite this awareness, none of the coaches interviewed reported regularly collecting any direct training
552 intensity or load data. Rather each coach described using their relationship with athletes and their
553 subjective understanding of the individual to determine levels of load, fatigue, and recovery.

554 John: "You have to be able to read the room as a coach. It's very important. Some days we'll
555 go in sparring, and you can like feel in the air that someone's going to get injured. And like you
556 have to be able to cut the sparring short and say, we're only doing three rounds today. And the
557 guy's will be like 'no I need to do more' and I'm like 'you don't'."

558 While emphasising coaches' subjective judgements, John was the only coach to discuss objective
559 measurement of training intensity or load in their MMA technical/tactical sessions.

560 John: "A lot of fighters wear heart rate monitors in the sessions and stuff as well. But I can tell
561 when they're run down, when they're tired when they're grumpy, cranky that sort of stuff from
562 knowing them if that makes sense. I can check (HR) for a full week, how the sessions pushing
563 them, when they should be on rest days….so I'll be like, 'you look tired today' and then they
564 might turn round and go 'I didn't sleep well last night', or they might turn around and go, 'I
565 haven't eaten this morning, I was in a rush on the way out'. Or maybe they trained too hard
566 yesterday and haven't recovered or sometimes people hold themselves back because they've
567 got another training session that night. There's a multitude of reasons, but we discuss them."

568

569 In John's case, objective analysis of load was arguably conducted on a superficial level, with subjective
570 assessments based on his personal relationships with athletes taking precedence. Here, the 'coach's eye'
571 was seen to underpin the monitoring of MMA athletes and determining training practices.

572 Mark: "You'll see it when they start to spar or wrestle sometimes, and they look just a little bit
573 jaded, and then you just tell them 'you probably need a rest day'…I don't do the perceived level
574 of exertion and all that anything like that….you can just tell the guys who're putting the effort
575 in."

576 One area which may explain the coaches' preference for subjective measure is the pragmatic difficulties
577 associated with objective load management in a skill-based training environment and the fact that
578 "overtraining is difficult to gauge isn't it" as opined by Mark. When faced with the challenges of

objectively monitoring fitness in MMA, the coaches articulated a primary focus on improvements in skill. As John summarised: “Looking for improvements in fitness, is like a bit of a tricky one because that’s not what I’m really looking at. I’m looking for, number one, improvements in skill”. Observing skill improvements or decrements in MMA, is however, also difficult as detailed by Ian:

> Ian: “That is the hardest thing in MMA! I’ve thought about this a lot….you can monitor it you can track it….with a sport where you need to jump a certain distance it’s easy! Can you jump further?...How do you measure the improvement of a jab? ….At first it’s easy because, ‘can you throw a jab? No. Can you throw a jab now? Yes. Cool well that’s improvement, I can measure that. And the next step is well can you use that jab to land in a live situation? Well now yes, I can. And now you’re hitting a point with ‘Well, now how do we measure it now?’ How do we say that that’s getting better? Because now you’re in situation where it depends who you are against.”

Once more, when faced with this challenge the coaches turned to subjective measures to determine performance improvements, especially during live drills and sparring sessions.

> Steve: “So when me and {OTHER GYM COACH} watch sparring on Friday night, if there’s something that might be annoying us: ‘I just watched four MMA rounds done there, two of you shot a takedown. Right, let’s get four weeks on boxing-wrestling here, let’s get them mixing the takedowns back in’. We’ll add the takedowns back in and before you know it: ‘four of you got heelhooked this morning. Does no-one know a heelhook defence in here? Right mate bang that in the classes the next three weeks.’ So it’s very much assess on the go.”

Theoretical Sensemaking

In the face of limited formal education, and challenging economic demands, it is not surprising that these coaches did not appear to utilise sport science or sport science practitioners for advice or information regarding their specific training practices. This reflects a previous survey of MMA coaches’ limited use of sports science (Batra, 2019). This is not to say that MMA coaches are ignorant of current training methodologies. On the contrary, these ‘early explorers’ espoused using technical/tactical drills to provide progressive overload, with one participant discussing this in relation to the general physical preparation (GPP) model. The coaches also expressed knowledge of the existence and purpose of methods such as rating of perceived exertion (RPE) and wellness monitoring. Rather, coach biographies (i.e., acquiring folk pedagogies), alongside a hyper-masculine social context, economic conditions that require a focus on recreational participants, and the necessity for training camps of varied durations, means that coaches eschew the application of objective sport science in favour of a potentially more

611 pragmatic use of their own judgement and experience. In documenting this, the present study has
612 illuminated how MMA coaches' practices are primarily shaped by biographical and contextual
613 influences, rather than sport science practices, and to an extent, formal educational influences.

614 While folk pedagogies may provide contextually relevant coaching practices, it is also necessary to
615 consider the potential for circular thinking. Specifically, while reflecting upon experiences and peer
616 learning opportunities can be sources of new knowledge, without sceptical thinking it is also possible
617 that such processes reinforce rather than challenge existing beliefs and assumptions (Cushion, 2018).
618 This may become further entrenched by coaches eschewing external advice and support once they
619 become established. The danger here is that MMA coaches may be practicing within an 'echo-chamber'
620 of social norms, where there is the potential for pseudoscientific practices to be passed from coaches
621 with high perceived capital to their 'apprentices' (Whitehead & Coe, 2021)This approach may be open
622 to the circular thinking that Cushion cautions against, and may occur for two reasons. Firstly, MMA
623 can be characterised as a hyper-masculine context (Spencer, 2012). As such it may be challenging for
624 established coaches to admit deficits in their knowledge and humbly seek knowledge from peers beyond
625 their own club. Secondly, as club owners seeking to attract customers and athletes, the coaches may be
626 seen as competitors to other club owners. Such relationships may restrict peer learning and make it
627 difficult for coaches to consider 'outside' help.

628 **Conclusion**

629 MMA is a developing combat sport that has grown rapidly, now occurring in almost every
630 international and national context at elite, performance and recreational standards (Fightmatrix, 2022;
631 IMMAF, 2021). The aim of this study was to explore the biographies, social contexts and practices of
632 professional UK MMA coaches who actively prepare participants for competition. Analysis of the
633 resulting data led to the development of four themes, which provide novel evidence of an environment
634 where coaching practices and beliefs developed and coalesced at the same time as the sport itself. The
635 sustenance of this environment is dependent on paying, recreational participants, which means sessions
636 are planned often with the needs of the recreational participant in mind, which may at times, come at

637 the expense of the performance athlete. Due to MMA competition being predominantly governed by
638 independent, for-profit event promoters, time for competition preparation is often ad-hoc and beyond
639 the control of the coach. Within this environment, a lack of objective monitoring means it would be
640 difficult to plan and execute a training program in keeping with current training load theory and
641 recommendations (Kellmann et al., 2018; Turner, 2011). Rather, the coaches' tended to enact 'folk
642 pedagogies', predominantly involving imitation and instruction, informed by subjective observations
643 and their prior experiences supplemented with some practices that may be consistent with training
644 theory.

645 Based on these findings we conclude that MMA training in these cases is largely based on the
646 promulgation of folk pedagogies which are not only inherited and promoted by MMA coaches, but are
647 developed in and reinforced by the social and economic environment of the sport. These pedagogies
648 arose during MMA's nascent in the absence of formal education or external support. The calcifying of
649 MMA coaching norms over the proceeding decades may be explained by the need to have paying
650 customers as well as competitive athletes enforcing a pragmatic approach to training. This becomes
651 entrenched with a growing unwillingness on the part of the coaches to access external support.

652 This study is the first that provides a pragmatic evaluation of the UK MMA coaching and training
653 environment. The discussions presented here supplement previous quantitative work from our research
654 group and others (Kirk et al., 2021; Uddin et al., 2020) to provide a novel and significant understanding
655 of a developing sport's coaching and training culture. Future research should explore how MMA
656 coaches may be supported in the unique and challenging environment they operate within, both from a
657 sports coaching theory and sport science perspective. This may entail working with coaches to design
658 and test coaching practices for competitive athletes that would also support paying customers more
659 interested in fitness and fun. There is also the potential to examine the effectiveness of the practices
660 detailed here in terms of athlete development and recreational participation/engagement. It may be that
661 the eschewing or absence of formal education allowed the most effective coaching practices for this
662 specific context to emerge free of dogmatic approaches transported from more established sports. The

663 influences of event promoters and their impact on coaching practices are also areas for future work to
664 determine if/how coaches, athletes and paying customers may be more appropriately served. Further,
665 this work presents four themes identified from exploratory interviews. These themes cannot fully
666 elucidate the entirety of the coaches' development or practice. As such, future research should explore
667 the gaps between these themes to provide a more rounded understanding of MMA coach development
668 and practice. Finally, given MMA's position as a very young combat sport, future research could
669 examine the similarities and differences between the coaching environment and culture of this sport
670 compared to other longer established combat sports such as boxing, wrestling and judo.

671 It is also noted that this research does have its limitations. This work only deals with coaches from one
672 region, and it is recognised that the social contexts of other regions and countries may provide different
673 findings. Interviews as conducted here may also limit the data being examined. Future work may expand
674 on this via immersive techniques to add a more nuanced assessment of coaches' social environment, as
675 well as that of the MMA participants themselves. Nonetheless, this paper provides a broad introduction
676 to MMA coaching and provides a platform from which future research can build.

677 **Statements and Declarations**

678 The authors have no relevant financial or non-financial competing interests to report. For the purpose
679 of open access, the author has applied a Creative Commons Attribution (CC BY) licence to any Author
680 Accepted Manuscript version arising from this submission.

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