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UK Trainee Sport Psychologists' Perspectives on Developing Professional Judgement and Decision-Making Expertise during Training.

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1 **UK Trainee Sport Psychologists' Perspectives on Developing Professional Judgement**
2 **and Decision-Making Expertise during Training.**

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6

Abstract

7 The research team explored UK trainee sport psychologists' perspectives on developing
8 professional judgment and decision-making (PJDM) expertise during their British
9 Psychological Society (BPS) Qualification in Sport and Exercise Psychology (QSEP; Stage
10 2). An assorted analysis approach was adopted to combine an existing longitudinal qualitative
11 data set with the collection and analysis of a new qualitative data set. Participants (female, n
12 = 1; and male, $n = 6$) were interviewed 4 times over a 3-year training period, at minimum
13 yearly intervals. Interviews were transcribed verbatim, and reflexive thematic analysis
14 applied to transcripts using the theoretical concepts of PJDM. Experience, analytical
15 reasoning, and observation of other practitioners' practice was useful for developing PJDM
16 expertise. PJDM expertise might be optimised through the use of knowledge elicitation
17 principles. For example, supervisors could embed critical cues within the anecdotes they
18 share to expand the experience base that trainees can draw from when making decisions.

19

Keywords: professional training, judgement, decision-making, cognition

20 **UK Trainee Sport Psychologists' Perspectives on Developing Professional Judgement**
21 **and Decision-making Skills during Training.**

22 Professional judgement and decision-making (PJDM) is an important skill for applied sport
23 psychology (ASP) practitioners, because decisions made by the practitioner hold an
24 influential role in the selection, design, and implementation of successful interventions
25 (Martindale & Collins, 2005, 2010, 2012). For example, when assessing client needs, early
26 decisions made by a practitioner on the nature of the goal (e.g., working to improve
27 performance or well-being) will influence the type of relationship that a practitioner will elect
28 to establish with a client (Martindale & Collins, 2005; Poczwardowski, Sherman, & Ravizza,
29 2004). Inevitably, these decisions influence how the practitioner applies sport psychology
30 knowledge.

31 Although early decisions on the needs of the client are fundamental, there is a
32 requirement within ASP practice for practitioners to continue to be adaptable to the dynamic
33 and ill-structured environments in which they operate. In other words, ASP is largely a series
34 of judgments and decisions (Martindale & Collins, 2012), and practitioners are required to
35 make these judgements and decisions at multiple levels of practice (e.g., programme,
36 intervention, and session) by responding to the changing needs of a client throughout the
37 consulting process. For practitioners, professional educators, and supervisors these decision-
38 making skills, along with the professional adaptability that is required to make them, should
39 be a clear goal of professional training and development.

40 Previous training and development research in ASP has examined individual trainee
41 accounts (e.g., McCormick, 2014), supervision (e.g., Andersen, Van Raalte, & Brewer,
42 1994), reflective practice (e.g., Knowles, Gilbourne, Tomlinson, & Anderson, 2007), and
43 current learning experiences (e.g., McEwan & Tod, 2015). To understand how trainee sport

DEVELOPING DECISION-MAKING

4

44 psychologists (TSPs) develop service-delivery competence (SDC), researchers (e.g., Hutter,
45 Oldenhof-Veldman, Pijpers, & Oudejans, 2016; McEwan & Tod, 2015; Tod, Marchant, &
46 Andersen, 2007) have identified the learning experiences that are useful for elements of
47 professional development. For example, peer mentoring has been identified as an alternative
48 form of guidance (e.g., in addition to supervision) whereby feedback could be sought on
49 client cases. Research on TSP professional development continues to be useful for
50 illuminating the helpful practices that TSPs can engage with throughout the professional
51 training period. Nevertheless, to advance on these insights, there is scope to examine how
52 these practices may contribute to the cognitive development of TSPs. For example, if peer
53 mentoring offers guidance to a TSP, it may be beneficial for professional educators to
54 understand what role peer guidance might play during the decision-making process (e.g., to
55 what extent do TSPs draw on this peer guidance during their own client consultations? Do
56 TSPs understand why it may be appropriate to apply this peer guidance in one client case,
57 and not another? Does peer guidance help TSPs shape their mental representations of ASP
58 practice? Or do TSPs rigidly copy and paste this peer guidance into their own repertoire of
59 practice techniques without a critical and nuanced understanding of its application?).

60 The term macrocognition has been used when referring to the cognitive functions and
61 processes that characterize how an individual may think in naturalistic settings (e.g., outside a
62 laboratory setting, where conditions are dynamic; Crandall, Klein, & Hoffman, 2006).
63 Traditionally, macrocognition research is focused on the study of the cognitive functions and
64 processes that affect individuals who are faced with difficult scenarios, in time-pressured
65 situations (e.g., firefighters or nurses; Klein, Calderwood, & Clinton-Cirocco, 2010; Patterson
66 et al., 2016). The delivery of ASP services also has time-critical features. For example, in
67 presenting a PJDM case study of a practitioner working with an elite judo player, Martindale
68 and Collins (2012) demonstrated that although a practitioner will often have time to make

DEVELOPING DECISION-MAKING

5

69 decisions analytically during the program and intervention level of practice (e.g., decisions
70 about the direction of support provided), practitioners will also be required to respond almost
71 immediately to the changing needs of a client, on a session-by-session level. Although it is
72 clear the macrocognitive function of decision-making holds a fundamental role in ASP
73 practice, what remains less clear, is how ASP practitioners develop the cognitive skills
74 required to make these decisions in ill-structured and time-pressured client situations, along
75 with the contextual sensitivity to recognize how and when to adapt their ASP knowledge
76 during the decision-making process (Crandall et al., 2006).

77 To gain understanding of how decision-making expertise is acquired, researchers in
78 other helping profession domains (e.g., nursing) have drawn comparisons between expert and
79 novice practitioners. For example, in a review of the perceptual-cognitive skills required to
80 make effective decisions, Klein and Hoffman (1993) noted that experts can perceive things
81 that a novice may fail to identify. In other words, there are many things that an expert can
82 perceive that remain invisible to others (e.g., an expert ASP practitioner may focus on the
83 non-verbal cues of a client by observing how she interacts with others, whereas a novice
84 might find this difficult due to inward attention, or dedication to pre-defined routines).
85 Experience allows the expert to perceive when something is missing or when expectations
86 have been violated. This cognitive expertise - whereby an individual can notice cues or
87 recognize patterns, and can make perceptual discriminations - is one of the key cognitive
88 elements that distinguishes experts from novices (Patterson et al., 2016). Thus, cognitive
89 skills allow the practitioner to make sense of situations, to plan, to re-plan, and to make rapid
90 decisions in time-pressured situations.

91 Drawing from empirical findings on expert and novice differences in learning
92 strategies, Phillips, Klein, and Sieck (2004) present six goals that may be helpful for
93 developing the cognitive skills required for effective decision-making: (a) enhance perceptual

94 skills (e.g., be able to detect typicality and variability in client cases), (b) enrich mental
95 models about the domain (e.g., know how their ‘tools’ work and recognize the limitations of
96 them), (c) construct a large and varied repertoire of patterns (e.g., develop situation
97 awareness to recognize relevant cues from clients), (d) provide a larger set of routines (e.g., a
98 range of skills and techniques that can be implemented with clients), (e) provide a larger
99 experience base of instances (e.g., a range of client experiences from which a TSP may draw
100 upon), and (f) encourage an attitude of responsibility for one’s own learning (e.g., a desire to
101 engage in professional development opportunities). Phillips et al. (2004) suggest that a
102 scenario-based instructional approach that addresses these six goals in training, may be
103 beneficial for facilitating the development of decision-making expertise within a specific
104 domain, such as ASP. For example, the use of case studies, where the practitioner is
105 encouraged to review decisions made and draw lessons learned, might be helpful for
106 expanding the vicarious experience base and enriching the mental models from which they
107 may draw. Exploring how ASP practitioners develop the cognitive skills required for
108 effective decision-making may help to advance knowledge on how effectively current
109 practice addresses these six goals. The aim of this study, therefore, was explore how TSPs
110 develop decision-making expertise during their professional training qualification.

111

Method

112 Research Design

113 This study used an assorted analysis approach that combined an existing qualitative data set
114 (from previous doctoral studies) alongside the collection and analysis of a new qualitative
115 data set (the first author’s for current doctoral study; see Heaton, 2008 for more detail on
116 assorted analysis). The existing dataset used in this study was longitudinal, and involved 3
117 semi-structured interviews, exploring UK trainee sport psychologists’ development during
118 professional training. The aim of the existing dataset was to explore perceived change and

119 development as a result of learning during professional training. Participants engaged in
120 semi-structured interviews to explore broad parameters of their development as TSPs, and
121 discussions around the decision-making process that participants engaged with began to
122 emerge. The current study aimed to add a 'new conceptual focus' (Heaton, 2008), by re-
123 examining the existing dataset to distil new reflections on PJDM development. Through
124 informal data sharing, the existing data set described above was made available by the second
125 author and will now be referred to as data set A. For clarity, the steps associated with the
126 assorted analysis approach used in this study are illustrated in Figure 1.

127 **Participants**

128 Following university ethical approval, all 11 UK trainee sport psychologist
129 participants from data set A were contacted in relation to the re-analysis of their interview
130 data for the new research objectives. Participants were informed of the purpose, risks and
131 safeguards of this study. Seven (female, $n = 1$; and male, $n = 6$) of the 11 participants granted
132 permission for their data to be re-analysed, and agreed to a follow-up interview with the
133 **principal** author. Four of the 11 participants did not respond. All participants were enrolled on
134 the British Psychological Society Qualification in Sport and Exercise Psychology (QSEP;
135 Stage 2) at the time of the collection of data set A, and were either awaiting qualification or
136 were eligible for registration as a Sport and Exercise Psychologist, recognised by the Health
137 and Care Professions Council (HCPC) at the time of the follow-up interview.

138 **Procedures**

139 To be grounded in the context of training and development within the domain, the
140 **principal** author became a member of the national training and development network for sport
141 psychologists. Initially, this provided her with opportunities to listen to the training and
142 development experiences of professional educators, supervisors, qualified practitioners, and

143 trainees. Exposure to this environment provided the building blocks for the principal author
144 to familiarise herself with the vocabulary used by participants. The principal author was able
145 to build relationships with the participants through informal discussions about their training
146 experiences. Building rapport with the participants prior to the follow-up interview helped
147 create researcher-participant familiarity and led to a richer discussion at the time of the
148 follow-up interview.

149 After the analysis of data set A (described below) and before the follow-up interview,
150 the principal author captured the training journey described in data set A for each participant
151 by providing a written overview of our interpretation of their transcripts. This overview was
152 sent to each participant to facilitate reflexive elaboration (Sparkes & Smith, 2014). Although
153 none of the participants elaborated or added to what they had shared at previous interviews,
154 the overview did create a discussion point for the start of each follow-up conversation.

155 **Interview guide.** The follow-up semi-structured interview guide was developed to
156 explore areas of training specific to the development of practitioner PJDM expertise. For
157 example, to understand how participants began to recognise a typical course of action, they
158 were asked to *“tell us about a significant experience that influenced a future client session.”*
159 The interview guide was designed based on the PJDM literature and themes that were
160 developed from data set A. For example, participants from data set A referred to their
161 supervisor on multiple occasions when they discussed how and why they worked with clients
162 in particular ways. To ensure the research team understood the influence of the supervisor on
163 the development of practitioner PJDM expertise, participants were asked to *“tell us about the
164 process of supervision during training.”* To probe further, participants were asked to
165 *“describe a typical supervision meeting providing examples.”* The principal author piloted the
166 interview guide with the second author and a UK TSP. Interviews were conducted at the

167 participants' convenience via Skype, telephone, or face-to-face. The interview guide is
168 available from the **principal** author on request.

169 **Data Analysis**

170 Following the guidelines offered by Braun, Clarke, and Weate (2016), a reflexive
171 thematic analysis (TA) was performed on data set A and B (generated from the follow-up
172 interview) using a PJDM framework while drawing on the principles of abductive reasoning
173 (e.g., while the **principal** author initially looked for evidence of development towards the six
174 goals in training, she also made note of anything outside of the PJDM framework). TA
175 allowed the **principal** author to search for patterns and develop themes which provided
176 congruence with the aim of the study. The PJDM framework was initially designed based on
177 the 6 goals of expertise offered by Phillips et al. (2004) and focused on how participants (1)
178 enhanced their perceptual-cognitive skills, (2) enriched their mental models, (3) developed
179 their repertoire of patterns, (4) developed a larger set of routines, (5) enhanced the
180 meaningful experience base available to them, and (6) took responsibility for their own
181 learning. The TA aimed to capture the ways in which participants might work towards
182 achieving these goals in current training practice. For example, in data set A, participants
183 recalled how they had begun to recognise how to help the client. To understand how
184 participants developed perceptual-cognitive skills, the research team searched for training
185 practices and processes that helped TSPs to recognise practice situations as typical and
186 atypical.

187 All 28 transcripts (from dataset A & B combined) were transcribed verbatim, and read
188 and re-read while listening to the audio recordings to check for accuracy. During data
189 immersion, on-going discussions with the second author (who completed the semi-structured
190 interviews in data set A) provided an opportunity to recover the contextual features from data

191 set A that were not directly available to the **principal** author. These talks also provided an
192 opportunity to glean insight into the rapport the second author and the participants had
193 created during the collection of data set A (Szabo & Strang, 1997). Understanding the
194 relationships between the second author and the participants helped the **principal** author to
195 build on that rapport by referring to previous examples at each of the follow-up interviews.
196 Initial codes were developed to represent aspects of the data relating to the development of
197 PJDM expertise. For example, whenever a participant referred to '*understanding how a*
198 *consultation had developed into its current state*' the code '*seeing consequences*' was
199 allocated. A thematic map was created to assign each code to potential themes within the data
200 sets. Themes and sub-themes were defined to capture the essence of what each theme
201 represented in relation to the development of PJDM expertise. For example, the theme
202 '*learning and integrating new ideas*' was defined as how participants developed techniques
203 that could be integrated into their own practice.

204 **Research Credibility**

205 Guided by the work of Sparkes and Smith (2014), several principles were identified to
206 assist research credibility. The research team aimed to: (a) ensure we understood the training
207 journey of each participant, (b) demonstrate to each participant that we cared about them, (c)
208 uncover the perspectives we brought to the study, (d) capture participants' perspectives on the
209 development of their PJDM expertise, (e) provide accounts of PJDM training practice that
210 would advance knowledge, and (f) provide information that is useful for practitioners and
211 professional educators. Based on these guiding principles, and from a relativist position (see
212 Smith & McGannon, 2018), rich rigour, credibility, sincerity, resonance, and significant
213 contribution were built into our research steps. To ensure we adhered to these principles we:
214 (a) created a data set that followed participants throughout their training journey; (b) built
215 trust and rapport with each participant; (c) immersed ourselves in the participants' training

216 environment; (d) employed principles of triangulation including analyst triangulation,
217 member reflections, and audience review; (e) used *critical friends* to encourage self-
218 reflexivity; (f) presented and discussed our findings within the field with other TSPs,
219 qualified practitioners, supervisors, and professional educators; and (g) provided implications
220 for TSP learning during training.

221 **Analysis and Discussion**

222 To illuminate that data analysis and interpretation took place in unison, the analysis
223 and discussion are presented together, and **this** is congruent with how participants expressed
224 their development towards the six goals proposed by Phillips et al. (2004); e.g., as
225 participants gained experience, aspects from each of these goals developed at once leaving
226 them difficult to separate. As a result of the TA, two themes and five sub-themes were
227 developed and are supported by participant quotations. In presenting this information, we
228 identified how the findings relate to and may extend understanding of how TSPs currently
229 develop decision-making expertise during training.

230 **Theme 1: Creating a Case Library from which to Draw**

231 When participants described the initial development of PJDM skills, it stemmed from
232 previous client experience. From each consultation, participants described a desire to
233 understand why the client session had evolved in the way that it had. For example,
234 “it’s...good to get an evaluation of the session, so what went well, why did it go well, what
235 was it that I did that made it go so well...things that I need to remember...so you can use it
236 again essentially” (TSP1). Participants suggested they wanted to learn from their experience
237 to feed-forward to forthcoming client sessions, and previous experiences soon became the
238 initial reference point for future decisions.

239 The role of practical experience in the quest for the development of expertise has been
240 well researched over the years (e.g., Bjork, 2009; Davis, 2009; Ericsson, Krampe, & Tesch-
241 Römer, 1993) and at times, has been identified as a means to achieving expert performance
242 levels. Nevertheless, Klein and Hoffman (1993) and Ericsson et al. (1993) both suggest that
243 direct experience alone, is insufficient. Instead, it is the opportunity to *learn* from experience,
244 along with the degree of engagement with the task at hand, combined with the opportunity to
245 be continually challenged that stimulates growth. This view is supported by TSP8 who
246 described the benefit of reflecting on practice,

247 “I tend to go in [to a consultation] and react to situations. You do the
248 reflections...pull apart the sessions...say what worked and didn’t work, why did I do
249 that...where did it come from? ... It’s the reflection afterwards...when you unpick,
250 that helps you understand.”

251 Participants recognised that examining previous experience provided them with an
252 opportunity to draw upon their experience with clients when deciding on how to move
253 forward with new situations. This finding offers support to the claims by Cropley, Miles,
254 Hanton, and Niven (2007) that reflecting on previous client experience can generate
255 knowledge and self-awareness, and facilitated practitioner decision-making on how to
256 improve future behaviour. Similar to the findings of McEwan and Tod (2015), participants in
257 this study reported reflecting with their supervisors, with other practitioners (e.g., other
258 TSPs), and individually (e.g., on their own without others) after client consultations.

259 Learning from experience, such as in the example above, has been increasingly linked
260 to the development of perceptual-cognitive skills in a range of professions including medicine
261 (e.g., Schubert, Denmark, Crandall, Grome, & Pappas, 2013), firefighting (e.g., Klein et al.,
262 2010), and the military (e.g., Ross, Klein, Thunholm, Schmitt, & Baxter, 2004). Being able to

263 perceive and recognise what is important to derive from one situation to another has been
264 identified as a significant step in the decision-making process. For example, Klein and
265 Hoffman (1993) suggest that as perceptual-cognitive skills develop, we can expect an
266 individual to begin to judge the typicality of a situation (e.g., a practitioner seeing what goals
267 are feasible when deciding on how to proceed with a client), to see distinctions (e.g., a
268 practitioner learning to discriminate between complex client issues), and to see antecedents
269 and consequences (e.g., a practitioner visualising how a client situation has evolved into its
270 current state, and how it may continue to develop).

271 **Analytical reasoning.** For participants in this study, examining previous experience
272 was a means to engage in deliberate analytical reasoning, a process whereby practitioners
273 participate in structured, systematic contemplation of practice features, and how they relate to
274 judgement of client cases (Patterson et al., 2016). TSP2 exemplified this process,

275 “I’ll have the consultations...and I’ll...start to write reflections of ...the
276 situation...what I thought went really well and maybe...action planning for next
277 time...At that point I might keep my reflections pretty brief...and then I’ll come back
278 to them... I’ll start...an afternoon of research ...to find something out...like... ' how
279 can I add to this' ...it could be an answer that I’m looking for...That then starts a
280 process of me going out there and doing a bit of research, ...and reading some books.”

281 Until recently, little was understood about the nature of the environment in which an
282 ASP practitioner is required to make decisions. Nevertheless, in establishing theoretical
283 understanding on the development of PJDM expertise within ASP, Martindale and Collins
284 (2013) offered new insights on why the development of analytical reasoning may be of
285 benefit to the decision-making process in which an applied practitioner will engage. For
286 example, in the presentation of a PJDM case study of a practitioner working with an elite

287 judo athlete, Martindale and Collins (2012) highlighted the influence of practitioner PJDM at
288 multiple levels of practice including programme (e.g., anticipating how the theoretical
289 orientation will fit with the overall program of support), intervention (e.g., considering how
290 the direction of support will fit the design of the specific intervention) and session level
291 (responding to emerging moment-to-moment issues within a session). The authors
292 emphasized the role of analytical reasoning in both the programme and intervention level of
293 practice, where the practitioner had a considerable amount of time available to engage in the
294 decision-making process.

295 The development of analytical reasoning in the present study was facilitated through
296 the examination of previous experience (See Huntley, Cropley, Gilbourne, Sparkes, &
297 Knowles, 2014 for a review of reflective practice in sport), by consulting contemporary
298 literature, or engaging in discussion with peers or supervisors. For example, TSP1 noted the
299 benefit of discussing upcoming client sessions with a professional practice group, “[It’s]
300 really useful and that tends to be more for the trainees so ‘I’ve got this [client session]
301 upcoming and what is everyone’s ideas and opinions?’ ” Engaging in analytical reasoning
302 during training provided participants with an opportunity to consider different options that
303 could be applied to client cases, while evaluating an alternative course of action (from what
304 they had originally planned), individually or with peers and supervisors. Training, as
305 illustrated by the examples provided above, where the action is slow and allows participants
306 time to process information, may be of benefit for developing the analytical aspect of
307 reasoning that is necessary in ASP decision-making (Martindale & Collins, 2013).

308 **Situation awareness.** Experience slowly became a catalyst for participants to
309 recognise client situations. For example, TSP7 reflected on how he had developed with more
310 experience,

DEVELOPING DECISION-MAKING

15

311 “I’ve probably got a better sense of the decision making actually. I’ve got a better
312 sense of...if I do action X now, then Y results, and I’ve got a better sense of well that
313 will also result in Z and I don’t want Z, I’d rather have W so what I’ll do is this.”

314 By drawing on previous client experience, participants could recognise similar
315 situations to help them identify a typical course of action that could be used with a client.
316 According to Klein and Hoffman (1993), developing a sense of typicality, as in the example
317 described above, can help an individual to better identify what information is important to
318 derive from a situation. Participants were essentially *pattern matching* against what they had
319 already seen or done. Being able to see patterns provides an individual with an opportunity to
320 develop situation awareness, helping them to recognise relevant cues within the environment
321 (Klein, 2017). This awareness can help facilitate practitioners in using the macrocognitive
322 process of mental simulation that supports the primary functions of decision-making, sense-
323 making, and problem detection (Crandall et al., 2006). Mental simulation requires the
324 practitioner to enact a series of events, and assess them as they lead to possible outcomes
325 while anticipating difficulties (Klein, Moon, & Hoffman, 2006). For example, the participant
326 quotation above is exemplifying a variation of the recognition-primed decision model,
327 presented by Klein (2017). Here, the participant is evaluating option ‘X’ by imagining how
328 this course of action may play out with the client (e.g., ‘Y’ and possibly ‘Z’). The participant
329 anticipates problems with option ‘X’, and rejects this in favour of option ‘W’ as the
330 anticipated end result. Being able to mentally simulate a course of action is derived from
331 extensive experience where mental models are formed to develop cognitive frameworks that
332 are *immediately* available to give meaning and structure to familiar situations (Hoffman et al.,
333 2014).

334 While mental simulation is commonly associated with making decisions at speed
335 (Klein & Crandall, 1995), participants in this study continued to develop and engage in this

336 macrocognitive process in an analytical manner. For example, TSP8 reflected on his
337 approach to decision-making,

338 “...I’d...do the reading on it [client situation] and chat to other colleagues and peers
339 that I’ve got... maybe even look back at other stuff that I’ve done before and see if
340 there was any similarities or maybe another athlete has shown something similar... -
341 So how did that help them? And then decide the best way to move forward with that.”

342 Although analytical reasoning may be useful for making judgements and decisions at
343 the programme or intervention stage of practice, it might not fully prepare a practitioner with
344 the skills required to make effective decisions at a session level where the practitioner is
345 expected to respond at speed, intuitively.

346 **Vicarious experience.** Participants also referred to the experiences of other
347 practitioners as a source they could draw upon when making decisions. This experience
348 included reading, observing, and listening to the client experiences of others. For example,
349 when referring to a discussion with another practitioner, TSP7 noted,

350 “Now that I reflect on it, a lot of listening to other psychs [psychologists]; it’s
351 storytelling, and hearing their stories... Maybe the massively experienced psych of 40
352 years has... got a lot of stories, cause they’ve seen a lot of stuff... I think that’s very
353 valuable for trainees to hear those stories.”

354 When asked what he found useful about this experience, TSP7 continued:

355 I guess a part of it is hearing what the approach was, how did they go about it? ...how
356 did it [the presenting issue] come to be there in the first place? ...but also... what
357 approach did you use? ...What did the client do? How did they respond? And
358 it’s... like you get 20 sessions condensed into 2 minutes versus, you had to sit there for
359 6 months... So you... get that compression of knowledge.

DEVELOPING DECISION-MAKING

17

360 The merits of sharing experienced practitioners' accounts of practice with trainee
361 practitioners has been well-documented in other domains such as the military (Klein, Hintze,
362 & Saab, 2013), healthcare (Geis et al., 2018), and firefighting (Hintze, 2008). Often, when the
363 shared experience is vivid enough, it can add to the experience base that a practitioner may
364 draw upon when making decisions. For example, using principles of cognitive task analysis
365 (see Crandall et al., 2006 for a review), Hintze (2008) developed scenario-based training to
366 allow novice firefighters to experience the situations through the eyes of expert firefighters.
367 Hintze (2008) found that scenario-based training, where expert feedback was made available,
368 was helpful for expanding the experience base of novice firefighters, with improvements in
369 situation awareness and decision-making skills.

370 The sharing of experience was evident throughout participants' training, and was used
371 during supervision, peer discussions, and networking events. Although identified as a helpful
372 experience that often stimulated the microcognitive process of storybuilding (Crandall et al.,
373 2006), participants noted it could be unhelpful at times too. For example, TSP10 claimed,
374 “He's [his supervisor] brilliant but he'll go off on a tangent. Sometimes the meetings
375 can end up talking about one of his clients. Now he's doing it in a sense that I'll share
376 my experience and how I'm thinking about it, but sometimes...I don't know what the
377 point is here.”

378 Participants claimed at times they failed to understand the importance of the
379 experienced being shared, missing the critical cues they might learn from, and subsequently,
380 were confused by the point of the scenario. For example, TSP7 described storybuilding
381 during supervision:

382 “The [supervision] sessions were so informal but I guess those stories are...a constant.
383 You're always gonna get stories both ways [from supervisor and trainee] but it's how

384 they tell that story that will often cause a reaction...your tone of voice just changed,
385 and sometimes that can be all you need to see something is important here.”

386 Although confusing, on occasion participants could pinpoint important cues within the
387 scenario by how it was told (e.g., a change in tone). Although this strategy might be helpful
388 for alerting the practitioner to ‘something’ important, unless the practitioner can understand
389 and make sense of the situation, then the sharing of experience during training may not be
390 sufficient to act as a vicarious experience where the practitioner can use the presenting
391 information in an effective way in future client sessions (Klein, 2017).

392 **Theme 2: Developing a Repertoire of Techniques**

393 As participants developed mental models of how psychological skills and techniques
394 were supposed to work in practice, they began to shape their role as sport psychologists, and
395 practice was often changed to reflect these developments. For example, TSP4 reflected on
396 how he practiced in year 1 of training: “I was so focused on getting through those questions
397 [from a book] that I wasn’t listening properly, I was taking them [the client] to
398 places...they...had no interest in going. I was forcing them in directions...” When asked
399 how he practiced now, TSP4 responded: “It’s client-centred...I’m quite passionate about
400 getting...to that root cause.” Participants agreed that in the early stages of training, they were
401 more likely to apply and stick to a ‘recipe-like’ approach – lifting guidelines for practice from
402 a book, and applying each step in a structured manner. This finding reflects the work of Tod,
403 Andersen, and Marchant (2009) who found that TSPs adopt an external and rigid orientation
404 within their role during training. This practice approach may be a direct result of the
405 professional pressures initially placed upon the trainee practitioner to demonstrate
406 competency in areas outlined by professional bodies, and may help to explain why

DEVELOPING DECISION-MAKING

19

407 participants were reluctant to deviate from their initial plan and the decisions embedded
408 within it, in the early stages of training.

409 As participants progressed through training, the accumulation of a range of
410 experiences played a role in the development of practice models, and how skills and
411 techniques embedded within practice could be used with clients. Participants frequently noted
412 a change in their understanding of 'how things worked' and began to make changes. For
413 example, TSP5 reflected on how his understanding of listening skills was beginning to
414 change:

415 "I'm thinking...I've got to listen - not just hearing what they're saying but focusing
416 on what they are saying...I've found myself thinking what question am I going to ask
417 now and how does it fit in with my approach...before I've really finished listening to
418 what they are saying."

419 Participants agreed that their understanding of 'how things worked' developed
420 through learning from their own experience with clients, and by listening to or reading about
421 the experiences of others. For example, TSP5 described the changes he was making to his
422 practice: "I've read a book on counselling skills...learning about active listening, learning
423 about paraphrasing, summarising. But of course it's not just a series of techniques, it's more
424 the attitudes they reflect..." This cognitive representation of 'how things work' is often
425 referred to as a mental model - an internal representation of the external world. In cognitive
426 science, these mental representations are a focus of how individuals understand systems
427 (Rouse & Morris, 1986). They allow the decision-maker to describe, explain, and predict the
428 purpose, form and function of practice skills and techniques. For example, as a mental model
429 of 'listening to the client' develops, we can expect a practitioner to be able to describe the
430 purpose and form of listening (i.e., why listening skills exist, and what they look like in

431 practice), explain the function and state of listening skills (i.e., how listening to the client
432 works, and what this will achieve with a client), and predict the state of listening (i.e.,
433 foreseeing how this may influence the client session). In developing mental models of their
434 domain, participants began to create a set of skills and techniques they could draw upon when
435 working with clients.

436 **Learning and elaborating on new ideas.** Being exposed to skills, techniques, and
437 approaches used by other practitioners was identified by participants as an opportunity to
438 borrow and adapt ideas for their own practice. For example, TSP7 noted;

439 “I steal stuff...I stole one [an ice-breaker] from an Institute psych[ologist] that I use all
440 the time. It’s great but I met up with another trainee...a few months ago, and he said,
441 ‘oh I always do this’ - ...he was talking about decision-making under pressure, he’s
442 got this little game he plays and I was like oh that’s brilliant.”

443 Participants often used skills and techniques that had worked for other practitioners
444 and adapted them in a similar context within their own practice. This shows similarities to
445 earlier discussions on situations becoming familiar, in that participants may be developing an
446 ability to recognise client situations as either typical or atypical, and draw upon the action
447 they have associated with this situation (Klein, 2017).

448 Although limited during the training period, formal observation (i.e., one-to-one
449 organised observation) was a training practice that prompted participants to think about *why*
450 and *how* they could begin to adapt their own practice. For example, when discussing
451 observation, TSP1 noted,

452 “...one observation that I did of someone delivering a one-to-one...she was very
453 comfortable with silence and didn’t...feel the need to jump in...and say something,
454 and...what often happened was she'd long that silence out, and the athlete would break

455 it...cause he just had some time to think. I remember taking that from that session and
456 thinking...that's something that I need to become more comfortable with - riding out
457 the silence and giving the athlete time to think... There were loads of strategies,
458 techniques that you pick up and just seeing it...reinforced that it might be something
459 that I want to consider in my practice.”

460 Participants believed that formal observation made them think about their own
461 practice, and how they could develop it to become better practitioners. Examining experience
462 post-observation continued to provide participants with an opportunity to challenge their
463 thinking about why things worked for others, before implementing change in their own
464 practice. Modelling of performance, as in the example above, has been increasingly linked to
465 the development of perceptual-cognitive skills when observation acts as a prompt for learning
466 to occur (Klein & Hoffman, 1993). Despite what has been learnt from social psychologists
467 (i.e., people learn from watching the behaviour of others), formal observation opportunities
468 within ASP training were limited.

469 **Have I become my supervisor?** As participants reflected on how they developed
470 their practice, it became apparent that informal observation had also played a role. For
471 example, TSP7 noted:

472 “...I think questioning skills - I think that's one thing [from a supervision meeting]
473 I've always picked up informally from [my supervisor], the other thing is...listening
474 skills...I picked up quite a lot of that from him informally...Looking for entry points
475 and listening and reflecting back. These are basic day one skills and just observing
476 how well he does that, you're like 'right ok I've got a long way to go.' ”

477 Participants commented that they had integrated various skills and techniques from
478 supervision, and now adopted a similar approach to practice when deciding on how to work
479 with clients.

480 For example, TSP10 explained, “I feel through reflection that I... just embodied [his
481 supervisor], and his attitudes, and styles and mannerisms, not mannerisms per se but the way
482 he speaks, and his ideas and that makes me cringe.” Participants in this study, who all had the
483 same philosophical perspective as their supervisor, agreed that supervisors were helping in a
484 similar way in which we would expect them to work with clients. This finding offers support
485 to the ethical concerns outlined by Castillo (2014) in that models of supervision tend to
486 mirror models of therapy. Castillo outlines various other concerns with the supervisory-
487 trainee relationship including transference. Similar to Van Raalte and Andersen (2000),
488 Castillo suggests that due to the power and knowledge differential inherent in the supervisory
489 relationship, it is entirely possible that a trainee practitioner may begin to mimic a past
490 significant relationship (e.g., parent or coach). This transference could lead the trainee
491 practitioner to relate to his or her supervisor with the aim of gaining approval or recognition.

492 Findings from this study may offer support to these claims by Castillo as TSP10
493 reflected on why he adopted a similar approach to his supervisor: “So I never felt I had to, it
494 was just...what age was I? 22 - quite impressionable, still am... It’s easy then to take on the
495 beliefs of someone, I suppose in a sense you admired because of their different approach.” In
496 the early stages of training, TSPs professional identities may reflect those of their
497 supervisors. With critical reflection on their own values and worldviews, TSPs might begin to
498 develop their own approach to practice (Tod, Hutter, & Eubank, 2017).

499 The idea that supervisors hold a significant role in the development of practice
500 models, and subsequently, philosophies of practice, echoes research findings on supervision

DEVELOPING DECISION-MAKING

23

501 in sport psychology and teacher training (e.g., Van Raalte & Andersen, 2000; Walkington,
502 2005). For example, in a study where teacher supervisors were encouraged to think about
503 how the values and beliefs of trainee teachers influenced the dynamics of learning to teach,
504 Walkington (2005) emphasized the role supervisors hold in the development of a philosophy
505 of practice, and suggested that supervisors must continually encourage trainee practitioners to
506 challenge their experiences and beliefs. Without the opportunity to do this, trainee
507 practitioners will simply maintain the beliefs and behaviours of the supervisor. Findings from
508 this study may offer support to the claims by Walkington. For example, while reflecting on
509 the development of his professional philosophy, TSP10 noted that although he was always
510 encouraged to do his own reading and generate his own ideas for practice, he commented that
511 his supervisor still held an influencing role:

512 “So massive influence on it [his philosophy of practice]...when I look back to make it
513 more specific to my own experience [of training]...I’m like, where am I developing
514 though? [his supervisor], (1), you’re not giving me anything else to read, and (2), I
515 shouldn’t be expecting you to do that anyway because if you do give me anything it’s
516 all influenced by existential approaches. It’s almost like, I just want something else.
517 Something different.”

518 TSP10 continued to reflect on his approach to training and practice:

519 “I don’t know if you’ve come across Brene Brown on Vulnerability? ...I find it a
520 fascinating area, but for me I’m always looking at it from an existential perspective...
521 So it’s kind of annoying because Brene Brown didn’t write it in that context so why
522 am I then looking at it like that?”

523 These findings support Hutter (2014), who outlined ethical concerns for novice supervisors
524 on whether they were examining their own work when monitoring trainee progress. For

525 example, Hutter noted that the supervisor will advise and guide TSPs in their work with
526 clients. TSPs then absorb the supervisor's input, and (at least parts of) the input is worked
527 into their own practice. Thus, a case can be made for the influence that supervisors have on
528 TSPs in relation to professional behaviour. Although TSPs may find this imitation helpful in
529 the early stages of training where they strive to demonstrate competence, TSPs may fall short
530 when forced to make decisions in atypical client situations. In short, unless TSPs understand
531 the rationale behind their behaviour, ASP as a profession is in danger of producing
532 practitioners who know how to fit the context, but lack the skills and confidence required to
533 make effective decisions in new or unfamiliar situations.

534 **Applied Implications**

535 The current study has contributed to the literature on sport psychology training by providing
536 empirical data on UK TSPs' perspectives on developing decision-making expertise during
537 training. Findings indicate that opportunities exist to accelerate development of these
538 cognitive skills (e.g., ensuring that TSPs have a critical and nuanced understanding of why
539 skills and techniques were appropriate for application in one client case, and not another).

540 The current findings give rise to several applied implications. First, a recurrent finding
541 in the study was the development of analytical reasoning to inform decision-making. TSPs
542 frequently created practice opportunities that provided time to process information by
543 examining previous experience, by consulting contemporary literature, and through
544 discussions with peers and supervisors. For example, TSPs drew upon their previous
545 experience with clients to look for similarities across client cases while searching for
546 direction on how to move forward when selecting appropriate interventions for new client
547 situations. TSPs also noted value in discussing client situations with peers where they could
548 collaboratively explore and identify ways to move forward in future client situations.

549 Although this practice is helpful for making decisions at the programme or
550 intervention level of practice (Martindale & Collins, 2013), it may not fully prepare TSPs to
551 make decisions at a session level where the practitioner must respond to the changing needs
552 of a client, at speed. When a practitioner can see consequences at speed, it becomes a source
553 of power (Klein, 2017). In the expertise literature, this source of power is often in the form of
554 a mental simulation, allowing the practitioner to explain cues and information they have
555 received to interpret and diagnose a situation at speed (Klein, 2017; Klein & Hoffman, 1993).
556 Given that ASP practitioners are required to think both analytically and intuitively when
557 applying sport psychology knowledge (Martindale & Collins, 2013), and with findings from
558 this study suggesting that TSPs are more attentive to developing analytical reasoning, it may
559 be beneficial for professional educators and supervisors to introduce training practices that
560 require the TSP to apply mental simulation (e.g., in role-play) to a client situation where they
561 can respond to the anticipated end states, at speed.

562 Tod et al. (2007) have documented the value in gaining service-delivery experience
563 via role-plays. Role-plays were useful for practicing how to manage specific situations that
564 may arise with clients, while drawing on past experiences, as practitioners performed within a
565 replicated client experience. Building on the work of Tod et al. role-play practice that
566 prompts TSPs to use mental simulation (e.g., to enact a series of events) where they pattern
567 match from previous experience may be useful for fuelling the development of the intuitive
568 type of thinking required in ASP decision-making. The model of mental simulation proposed
569 by Klein (2017) can guide this practice. Applying mental simulation during role-play would
570 require the TSP to first identify the need (e.g., to explain the past, or project the future of a
571 client situation). The TSP would then develop a 6-phase action sequence (e.g., the set of
572 transitions that make up the simulation), before evaluating the sequence for coherence (e.g.,
573 does it make sense?), applicability (e.g., will the TSP get what they need?), and completeness

574 (e.g., does it include enough detail?). The sequence is then run to form an explanation, model,
575 or projection. If the TSP experiences difficulties with the internal evaluation, the TSP may re-
576 examine the need, and/or reconstruct the sequence before trying again.

577 Role-play with mental simulation could also *strengthen* the development of intuition.
578 For example, in clinical and counselling psychology, role-plays were identified as useful for
579 developing service-delivery knowledge through peer, actor, and supervisor feedback
580 (McEwan & Tod, 2015). Although Tod et al. (2007) reported that students felt uncomfortable
581 and fearful of their behaviour being identified as right or wrong during role-play, engaging in
582 critical discussions on decisions made during mental simulation might help to strengthen the
583 experience base that TSPs can draw from in future consultations. Pitt et al. (2015) have also
584 outlined the benefits of immediate, real-time feedback for TSPs who work in consultancy
585 teams, including opportunities to draw upon a greater depth of experience when interpreting
586 client situations, and to enhance TSP expertise in consultancy settings. Martindale and
587 Collins (2013) noted that opportunities to engage in pro-longed practice in combination with
588 real-time feedback is considered one of the conditions for the development of skilled intuition
589 in ASP. For example, if a TSP applies sport psychology knowledge that is less helpful for a
590 client, and remains unaware of this, it is likely that the TSP will reproduce this behaviour
591 from memory, creating a faulty intuition. The introduction of training practice that also
592 allows for real-time feedback, may create an opportunity to refocus aspects of training on
593 *why* we do the things that we do, creating more meaningful learning experiences for the TSP
594 (Martindale & Collins, 2010). This blended approach may be useful for fuelling development
595 of both the analytical and intuitive thinking that is a requirement of ASP decision-making.

596 Findings also indicated ways in which the experiences of other practitioners (e.g.,
597 supervisors) could be optimised for use in sport psychology training. TSPs emphasised
598 drawing upon the experiences of others when deciding how to move forward during

599 consultations, and when to develop and refine their practice models. Although the sharing of
600 scenarios from supervisor to trainee has been identified as a means to pattern match from
601 case-to-case in other domains (Patterson et al., 2016), trainees must first understand the
602 scenario being staged to use the presenting information in a meaningful way in future client
603 cases (Crandall et al., 2006). For example, TSPs in this study reported missing critical cues
604 they might learn from within a scenario (e.g., supervisor's shared experience), and at times
605 were left confused. Nevertheless, TSPs noted that on occasion, even if they failed to
606 understand, they could still pinpoint important parts of the story by a change in tone.
607 Although this shared experience might be helpful in the short term, unless TSPs can make
608 sense of the scenario being presented, and the decision-making process embedded within it
609 (e.g., what information was considered during decision-making?), it is unlikely to be helpful
610 in applied situations in the future (Klein, 2017). In other words, it would be naïve to assume
611 that TSPs could borrow and apply the work of other practitioners with the same effect, unless
612 they understand the rationale for the application (i.e., why do they do the things that they do?;
613 Martindale & Collins, 2010). One way that TSPs may gain access to this rationale, is to elicit
614 the decision-making knowledge used by domain experts (e.g., ASP supervisors) via cognitive
615 apprenticeship.

616 Cognitive apprenticeship is a model of training that helps to make thinking visible by
617 illuminating the cognitive strategies used to make decisions (Collins, Brown, & Holum,
618 1991). In contrast to traditional apprenticeship models, where the expert (e.g., the supervisor)
619 shows the trainee how to complete a task, cognitive apprenticeship provides a platform to
620 elicit how the expert thinks, what they are paying attention to, how they structure
621 information, and the strategies they are using to make decisions or detect problems (Crandall
622 & Gamblian, 1991). These knowledge elicitation principles have been applied in various
623 domains, and in various forms, to capture and disseminate the tacit knowledge used during

624 expert decision-making. For example, Crandall and Gamblian (1991) used the critical
625 decision method (CDM) to capture and communicate the perceptual skills needed by nurses
626 who were new to a neonatal ward. Patterson et al. (2016) also used the CDM to develop
627 simulation-based training that would facilitate the acquisition of expertise in the early
628 recognition of sepsis. Using applied cognitive task analysis (ACTA), Martindale, Collins, and
629 Morton (2017) ‘made thinking visible’ by capturing the decision-making thought processes
630 of expert crime scene examiners, while highlighting the cognitive demands placed upon these
631 practitioners when working in an ill-defined domain. In these studies, the tacit knowledge
632 required for expert decision-making was extracted and used to develop training material to
633 bring new practitioners up to speed. In ASP, ACTA could be applied to maximise the use of
634 shared experience between the supervisor and their TSPs. ACTA consists of three interview
635 techniques with the expert (e.g., the supervisor) to extract the cognitive demands of the
636 experience they are sharing (Militello & Hutton, 1998). The final step in ACTA is to produce
637 a cognitive demands table to consolidate the data collected during each interview technique.
638 This data could then be used to create training scenarios for TSPs where they can compare
639 their thinking (e.g., cues, projections, and anomalies) in simulated client cases, to that of the
640 expert.

641 Findings from the current study offer support to Martindale and Collins (2010)
642 suggestion that there are several benefits to exploring the metacognition behind expert
643 decision-making including uncovering another layer of understanding when disseminating
644 knowledge to the TSP. For example, instead of only explaining what the supervisor did, it
645 may be helpful for the trainee to hear *why* they recognised cues as relevant to that client
646 situation, what they anticipated would happen, or why some goals were more feasible than
647 others (Klein & Hoffman, 1993). Exposure to this type of information during training could
648 encourage a step away from traditional procedural training approaches (e.g., a copy and paste

649 approach as discussed earlier in this study) by helping trainees to recognise different options
650 that may be available to them, and why these options might be applicable in some client
651 situations and not others (Cruickshank, Martindale, & Collins, 2018). The application of
652 knowledge elicitation studies in ASP that focus specifically on decision-making have the
653 potential to produce training material that could fuel development of TSPs' ability to make
654 effective decisions in a complex and ill-structured domain, such as ASP.

655 Finally, given that supervisors have been identified to influence how TSPs make
656 decisions, it may be helpful to uncover the supervisors' perspective on the role they play in
657 developing TSP decision-making expertise during professional training. For example, TSPs
658 noted they unconsciously picked up skills and techniques that could be used with clients by
659 informally observing supervisors. Subsequently, practice models often mirrored the approach
660 adopted by the supervisor. Informal observation, where the TSP remains unchallenged on
661 why supervisors might be practicing in the way that they do, may limit the development of
662 key microcognitive functions and processes such as decision-making, sensemaking,
663 storybuilding, and problem detection. Therefore, it may be beneficial to explore the intentions
664 of training practices offered by supervisors (e.g., observation), during supervision. This line
665 of enquiry may help to illuminate new training requirements for both TSPs and supervisors,
666 while providing new training direction for professional training educators (Cruickshank et al.,
667 2018).

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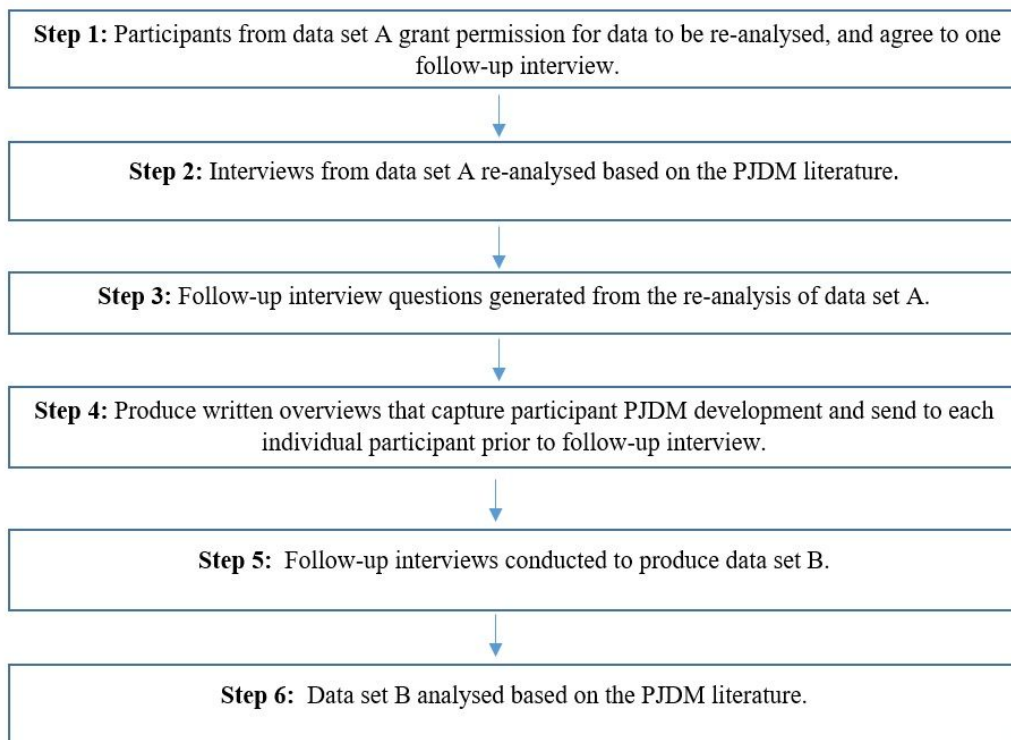


Figure 1. Assorted analysis research steps

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Review

PJDM ARTICLE – MINOR REVISIONS RESPONSE DOCUMENT (TSP)**Reviewer 1 & 2:**

Response

Thank you for the helpful comments, and for taking the time to re-read this manuscript. It really has helped to strengthen the contribution.

Associate Editor:

Response

Many thanks for your kind words regarding the revision, and again, for taking the time to re-read this manuscript. Please find below a response to each of your points.

Reviewer comments	Response	New page and line number
L. 83: should be 'he or she', not they	<they> removed, and <she> added.	Page 5, line 83.
L133, 144, 165, 168, 173, 175, 191 and 194: should be 'principal' not 'principle'	All instances of 'principle' changed to principal.	
L223: should be 'and this is...'	<this> added.	Page 11, line 223.
L293: should be 'him or her', not 'them'	<to them> removed. We feel the sentence reads better now.	
L350: should be it's	Changed to it's.	Page 16, line 350.
L526: should be supervisor's	Changed to supervisor's	Page 24, line 526.
L653: should be TSPs'	Changed to TSPs'	Page 29, line 653.

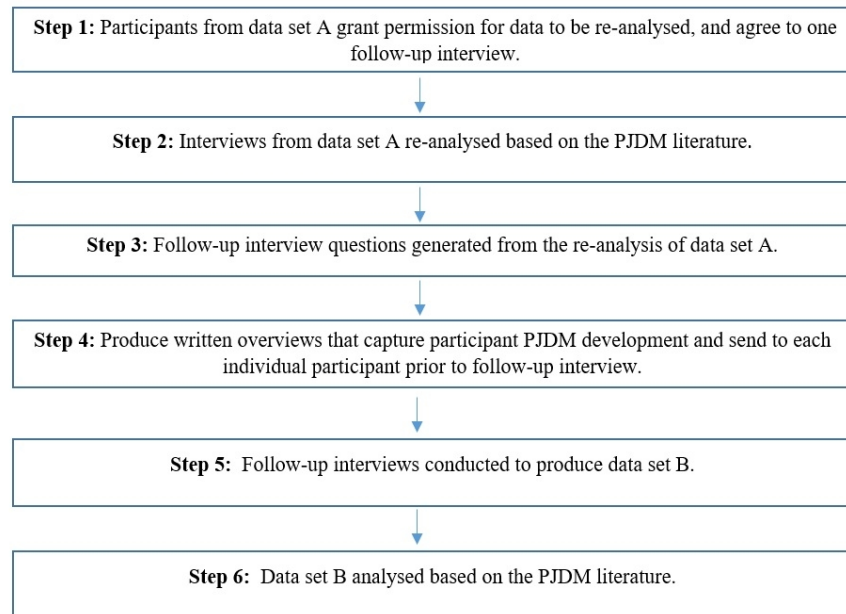


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