

The Hills are Alive with. . . Many Different Folk! Rationalising and Operationalising a Professional Judgment and Decision-Making Approach within Mountain Leadership

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Abstract

Growth in the adventure sector has increased the demands on adventure sport professionals. Satisfying a diverse range of participatory motivations, however, requires an adaptable and flexible workforce. In this discursive paper we suggested that a narrowing of service skills caused by commodification and sportification, are compounded by general (mis)perceptions of *who* best suits the adventure sector. Accordingly, this paper discussed two important implications for outdoor professionals to improve inclusivity standards. Specifically, using mountain leadership as an exemplar, we firstly, presented themes in connection with motivations and social dynamics. Secondly, we contextualised these themes against pertinent environmental challenges. Finally, we presented a decision-making approach and its requisite planning and reflective skill-sets, designed to assist mountaineering professionals to negotiate the complexity presented by individualised service provision. We concluded that there are no simple solutions to these complex and multiple issues. Services require better alignment between epistemology and delivery via an epistemological chain.

Keywords: hiking/hill walking; leisure; metacognition; nature sports; professional practice

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3 An important case has recently been presented for a comprehensive and nuanced
4 analysis of adventure sports, going beyond the general (mis)perception that these are
5 characterised by thrill/rush, sensation seeking attitudes (see Buckley, 2012) and/or risk taking
6 behaviours within dangerous environments (Collins & Brymer, 2020)¹; in short, what many
7 (non-participating) observers would describe as adhering to the ‘adrenaline junkie’
8 stereotype. Instead, authors have long proposed a need to focus on participants’ lived
9 experience of adventure sports (e.g., Brymer & Schweitzer, 2017; Eastabrook & Collins,
10 2019; Kelly, 1955). When defining sports (or activities) of this nature as a *personal* construct,
11 it appears that participants’ motivations are, in fact, highly varied and complex. Indeed,
12 participants engage with these, often dynamic or hyper-dynamic, environments in diverse
13 ways (e.g., Asfeldt & Hvenegaard, 2014; Ewert et al., 2013; Lipscombe, 1999; Woodman et
14 al., 2010). For some, adventure sport *is* primarily about thrill seeking, for others, control and
15 risk management. Equally, for some participants, it is an adventure tourism activity sought
16 for promoting health and wellbeing, interaction with the environment and/or social
17 interactions. Unconstrained by the rules and boundaries that must be obeyed in traditional
18 sports, participants of adventure sports are allowed the freedom to determine their
19 performance context, criteria for success and the level of challenge and approach (e.g.,
20 timescale) to achieving their goals (Collins & Brymer, 2020). As a result of an individual’s
21 relationship with the environment and the activity, *they* create sport-specific ethical codes
22 that are maintained individually and frequently shared between their respective peers and the

¹ We have chosen to use the term ‘adventure sports’ as a reflection of the aims and scope of this journal; however, we acknowledge that a range of different terms have been used (e.g., nature and action sports). Collins and Brymer (2020) provide an initial attempt to unpick the messiness of this myriad of terminology.

23 wider community of practice at, for instance, a crag, play-spot or break (Christian et al.,
24 2020). This individualised aspect means that it is nigh impossible to meaningfully
25 conceptualise adventure sports of this nature without consideration of the participant
26 involved; thus, many conceptualisations and manifestations of these types of sports exist.

27 Accepting a personally defined perspective of adventure carries with it many societal
28 (i.e., inclusivity) and practical (i.e., practitioner skill-set) implications for the adventure sport
29 professional of course, *if* effective learning and performance opportunities are to be obtained
30 (in their many personally defined ways) by their paying clients. It is towards these social and
31 practical implications for the adventure sport professional that this discursive paper aims to
32 inform more optimal service provision. Addressing the first implication is the clear
33 underpinning rationale for promoting inclusivity (Wankel & Berger, 1991) which can be
34 achieved through individualised practice. We are aware that in many domains the terms
35 ‘inclusion’ or ‘inclusive practice’ are sometimes overly-associated with a targeted group
36 within a population (e.g., based on gender, age, disability, ethnicity). In this paper, we use the
37 term inclusion to mean an all-inclusive approach without directing emphasis toward any
38 persons in particular (Paul, 2010). Secondly, as we unpack later in this paper, inclusion
39 relates to the implied pre-requisite expertise of professional practitioners in being able to
40 facilitate this. To satisfy these conditions requires an *adaptable* and *flexible* workforce,
41 underpinned by a breadth of facilitation skills which rely on awareness of individual
42 differences, situational demands and an acuity for cultural associations between the
43 participant(s), activity and environmental context (Collins & Collins, 2015). In practice, the
44 implementation of an all-inclusive approach, and the resulting avoidance of falling into the
45 trap of assuming one size fits all, presents a far more complex and difficult task for the
46 adventure professional due to a greater variety of interactions between the individual, their
47 environment and desired outcome(s).

48 Paradoxical to this desire for a flexible and adaptable workforce, reality depicts the
49 professional adventure sector as becoming increasingly ‘commodified’, ‘sportified’ and
50 ‘manufactured’ in environment to make activities more recognisable, standardised and
51 saleable (H. Brown, 2000; M. Brown & Beames, 2017; Swarbrooke et al., 2003). With a pre-
52 occupation on risk and safety management, there is a high potential to ‘de-skill’ the
53 developing workforce due to an absence of ‘tools’ to individualise their teaching and
54 leadership practice for different motivational and other pertinent needs. As such, this paper
55 focusses on reinforcing and building upon this current need.

56 We have chosen to exemplify our case through the specific domain of
57 hillwalking/hiking, which was underpinned by three main reasons. Firstly, drawing on
58 research from Collins, Carson et al. (2018) concerning the professional practice of summer
59 mountain leaders, national governing body training presents an imbalance of focus on risk
60 and safety management practices (largely through technical skills; e.g., MountainTraining,
61 2015), which is only a narrow representation of their service provision (e.g., expeditions on
62 challenging terrain and changing conditions to reach a summit). Secondly, Collins, Carson et
63 al. (2018) *also* identified judgment and decision making ability as being of perceived
64 importance for effective practice and development in the situation mentioned above by
65 summer mountain leaders, yet there was, by their self-admission, a recognised need for
66 improvement in such skills. Indeed, despite the Summer Mountain Leadership award
67 including ‘sound judgment’ as an outcome of training, this mainly refers to aspects of safety
68 and includes no information on how this outcome can be achieved, leaving trainees to
69 develop judgment in an ad hoc manner through a specified minimum number of 20 quality
70 mountain days (MountainTraining, 2015). Thirdly, with the personalised construct of
71 adventure in mind (Eastabrook & Collins, 2019), hillwalking/hiking can for some participants
72 constitute a highly emotional experience with elements of perceived high-risk involved (e.g.,

73 Coble et al., 2003). Depending on factors such as walking/hiking experience, physical
74 capability or specific sense of place, these can stimulate a range of responses/sensations, at
75 one extreme this can be nerve-wracking, exciting and perceived as high risk and at the other a
76 relaxing, tranquil and regenerative experience (Vallerand, 2004). Therefore, contextualising
77 how an approach that might assist mountain leaders to enact greater inclusivity through a
78 different (but still familiar) type of challenge was seen as serving to build upon the work of
79 Collins, Carson et al. (2018) on judgment and decision making *and* exemplify the necessary
80 adaptability recommended by Collins and Brymer (2020).

81 Therefore, in this paper, we present these ideas by firstly examining a specific subset
82 of participants, hill walkers and hikers. Empirical evidence from the leisure and tourism
83 literature is presented to exemplify the variety of personal motivations for what is often
84 considered as ‘soft’ (Beedie & Hudson, 2003) adventure within this domain. Activities
85 involved in hillwalking and hiking are not typically associated with the perceived high risks
86 commonly assumed within many adventure sports. Yet, mountain leaders are well used by
87 these participants as part of their working role and, at the same time, also being expected to
88 lead on more arduous, complicated and dangerous expeditions (e.g., International Mountain
89 Leaders being accredited across summer, winter and alpine terrains and conditions; see
90 Collins, Carson et al., 2018). Moreover, and considering the personal experience of
91 adventure, an inexperienced hiker might anticipate the challenge of a scramble to the top of a
92 moderate summit as presenting a form of rush/thrill, whereas an experienced and skilled
93 adventure participant might perceive this as low risk/low thrill. Following this, we
94 contextualise these findings against exemplar working challenges and illuminate the
95 implications for practice by summer mountain leaders. Finally, we present the nuanced
96 professional judgment and decision making (PJDM) approach and its requisite planning and
97 reflective skill-sets designed to assist mountain leaders negotiate the complexity associated

98 with individualised service provision. Note that while this paper is discursive in nature, we
99 include purposeful signposting throughout to important empirical studies and primary
100 literature as a comprehensive resource for researchers and practitioners.

101 **Understanding Hill Walkers'/Hikers' Participation within the Outdoors: Emergent** 102 **Themes from the Literature**

103 It is somewhat difficult to precisely position hill walking and hiking within this
104 domain, since these activities span from the more sedate activities such as photography and
105 foraging to exposure to mountainous conditions (Boyes et al., 2019; Brymer & Gray, 2010;
106 Crotts, 1995). However, academic literature places hill walking and hiking on the 'soft' side
107 of a soft–hard continuum, with the 'hard' side featuring more 'extreme' activities (Beedie &
108 Hudson, 2003). Perhaps more meaningful to understand is that motivational elements reveal a
109 diversity of push and pull factors for the activity and the locations sought to participate.
110 Indeed, tourism and adventure by its nature entails seeking experiences away from the norm
111 (Hammit, 2000), and thus walking activity whilst on holiday is often different from regular
112 activity (e.g., walking to get to work); although for some, seeking new recreational walking
113 routes at home is also a way of life. Walkers can, therefore, be categorised as casual or
114 serious in their participatory approach (Davies et al., 2012), which will need to be
115 accommodated for by the leader across a broad range of physical, social and psychological
116 factors.

117 One key consideration of hillwalking/hiking, therefore, is the time required relative to
118 the participants intended experience. Typically, a walk can last a full day, and for long-
119 distance trails, multiple days are taken. Notably, other than challenge walking such as Munro
120 bagging, walking is generally not dependent on being undertaken in the quickest possible
121 time. Accordingly, 'slow tourism' is increasingly discussed as a sustainable, experiential
122 niche which includes that act of savouring the moment and the environment (Dickinson &

123 Lumsdon, 2010); a probable key factor in explaining why some walks are longer in duration
124 than may be required based on physical fitness alone. In fact, ‘slow adventure tourism’ (an
125 escape from the hypermobile fast society) is also now permeating academic consciousness
126 (Varley & Semple, 2015). Crucially, with such flexibility comes a more significant
127 opportunity for inclusion, *but* also a need for effective time management in planning by the
128 mountain leader, especially in locations where conditions and weather can be highly variable.

129 For the serious walker, motivations to undertake activities across these timescales
130 may include endurance or adventure challenge (Ainslie et al., 2005; Edensor, 2000).
131 Moreover, walking in groups is increasingly seen as a social and shared experience, with
132 health and wellbeing benefits (Priest, 2007); for example, the goal of walking 10,000 steps.
133 Indeed, the role of technology has increased in facilitating walking activity, notably in
134 sharing online experiences and navigation and in doing so has altered the experience and its
135 appeal (Davies, 2016). Although health is not always the primary reason for why people
136 walk, it is, increasingly, a general motivation which is part of a more complex tapestry
137 comprising being close to nature (den Breejen, 2007), experiencing spirituality (Sharpley &
138 Jepson, 2011), rural social history and environmental education (Orion & Hofstein, 1991).
139 Clients may want a more insular experience, for example walking solo, that can involve
140 developing self-regulatory skills, overcoming fears, building resilience and resourcefulness
141 (Coble et al., 2003; cf. Collins & MacNamara, 2012); these are *also* elements the mountain
142 leader can explicitly provide support on for solo (e.g., encouraging a client to summit first) or
143 guided walks depending on the nature of the relationship sought by the participant(s). Finally,
144 wilderness experiences have been shown to provide psychological benefits to individuals in
145 nurturing self-esteem and self-awareness (Scherl, 1988). It appears that the literature on this
146 subset of participants well supports a notion of diverse activity and motivations and in doing

147 so presents a strong case for individualised service provision by professionals within the
148 domain.

149 Considering the activity itself, indeed even before the physical effort of the walk
150 commences, much of the appeal for regular participants in hiking and hill walking involves
151 the preparation which underpins the walk. ‘The journey to the summit’ begins with the maps
152 the night before, the conversation between friends in the pub the week before, or the journey
153 to the start of the walk. Accommodation and transport are an integral part of walking holidays
154 and multi-day walks, which may also be the responsibility of the leader to organise (Davies &
155 Weston, 2015). The infrastructure in the nearby villages, for example, determines the
156 experience, as does the state of footpaths and, depending on preference, the absence or
157 presence of signage, again research that could be expected from a leader (Boyes et al., 2019).
158 After the walk, memories of particular instances (‘when John fell over in the mud’ or
159 ‘remember that amazing vista when we came along the ridge’) may prolong the experience
160 and act as a useful source of feedback for the leader towards future planning. Wylie (2005)
161 argues that walks are punctuated by a series of instances, as a clock is divided by hours,
162 without the involvement of actual time. As such, and in a similar vein to the work of applied
163 sport psychologists working away at an event (Fraser & Shahvali, 2017), mountain leaders
164 must *continually* monitor to understand their group’s dynamic and its situational demands,
165 even during informal periods when they are perceived to be ‘not working’, such as when in a
166 hut or en-route to the hills. Appealing to the notions of flexibility and adaptability, and
167 depending on the context surrounding the walk, responsibilities of the walk leader are
168 diverse.

169 From this overview, it is clear that individual walkers have complex needs which are
170 shaped by previous experiences, confidence, logistics, other walkers and individual
171 preferences. Hillwalkers and hikers are therefore driven by individually constructed novel

172 experiences which are generated by engaging in activity (Lee & Crompton, 1992). A
173 challenge for managing walking and hiking experiences rests on developing an accurate
174 understanding of these circumstances and their impact on the participant(s). Failure to do so
175 risks participants disidentifying with leaders who may provide assistance to realising their
176 goals and, in turn, stifle growth and development within the sector.

177 **Mountain Leaders: Working Context and Potential Challenges**

178 Increasingly, research is highlighting the complexities associated with professional
179 practice in this sector, in large part due to the ‘open’ or ‘hyper-dynamic’ characteristic of
180 mother nature herself (Collins & Collins, 2016a). Alternatively, some have described the
181 presence of multiple interrelated factors as being ‘wicked’ (Horn & Weber, 2007).
182 Specifically, the organic evolution of interactions between the environment, the participant,
183 their aims and objectives for participation as the activity progresses, places high cognitive
184 load on the leader. The challenge is notably increased if the information is difficult to
185 decipher, for instance anticipating the environment, its impact on the participant and also
186 meeting any objectives for the activity. For example, a wicked situation might be
187 characterised by, constantly altering conditions and weather. Consequently, these place high
188 physical demands on the group and their likely ability to meet the day’s objectives. As such,
189 this complex situation might oblige the leader to change route to avoid fatigue by adjusting
190 distance covered, gradient *and/or* height gained. Therefore, wicked situations make it
191 difficult for the mountain leader to identify, or select, a single best course of action. Indeed,
192 the solution to a problem may generate other problems and challenges for the leader. For
193 instance, extending our example above, let us suppose that the leader had taken the decision
194 to ascend a peak avoiding the directly exposed (e.g., weather, height) ridgeline, instead
195 preferring a contouring path to a col and then up a short steep, but leeward, approach to the
196 summit. This decision may expend less energy overall, but take an additional hour with the

197 consequence that the descent from the peak is partially in the dark. Therefore, the leader
198 might decide to descend a less difficult and slower route but that is safer under foot. A
199 potentially additional hour and a half of walking time is thus a trade-off consequence to avoid
200 exposing the group to on the originally planned ridge. Members of the group seeking the
201 excitement of the ridge may be less enthusiastic and demotivated by the decision (although
202 hopefully sympathetic), whereas, those walking for social or health benefits, for instance,
203 may be less affected *or even* more motivated. Of course, the manner in which the leader
204 presents this change of plan to the group is critical given the interaction between motivational
205 and physiological factors on performance (Barte et al., 2019).

206 Notably, these complexities contrast to other traditional sporting situations whereby,
207 despite *some* variation, of course, activities might always be undertaken indoors, on the same
208 sized court, using the same rules and so on. To respond effectively, the leader must anticipate
209 the changing environment while accommodating the aspirations, motivations, fitness and
210 experiences of the participant(s). Crucially, however, these situational demands place further
211 pressures on the leader while also ensuring safety and enjoyment of the activity. In short,
212 leading will sensibly require adaptability and flexibility under such circumstances rather than
213 maintaining a fixed set of procedures or representing the task, environment or participant(s)
214 in an oversimplified way, which is a potential risk of the increased commodification,
215 sportification and practice within manufactured environments mentioned earlier (cf. Collins,
216 Carson et al., 2018).

217 **Addressing the Client–Context Challenge: Implementing a Professional Judgment and** 218 **Decision-Making Approach**

219 Catering for the situational demands of participant individuality and a dynamic
220 environment in combination (described above), presents a definite challenge to service
221 provision as a standardised (i.e., commodified) product. Add to this the many organisational

222 constraints such as time and equipment management, and the mental load on mountain
223 leaders can become potentially overwhelming. Therefore, to satisfy client needs mountain
224 leaders have to manage this complexity, accepting the possibility of and preparing for a
225 change in the course of action(s) as the activity unfolds. For example, accumulating physical
226 and psychological stress caused by the terrain may expose one individual within a group as
227 less than able to complete the planned route, and so a compromise decision must be made
228 regarding a route change or techniques for supervision (Boyes et al., 2019). While much
229 previous research has probed the behaviours of experienced/expert practitioners (e.g., Ford et
230 al., 2010; Schempp et al., 2004) to try and determine routine and/or specific practice that may
231 be attributed with such status, the PJDM approach *also* emphasises the importance of a
232 practitioner knowing *why* these actions were taken as a crucial factor for success. In short,
233 expert practice should not be viewed independently of a predetermined intention (Martindale
234 & Collins, 2005), especially when adaptability and flexibility are a primary characteristic of
235 the role. Through this lens, effective practice can be understood as relying heavily on good
236 judgment and decision-making skill in exercising knowledge, both declarative (‘what needs
237 to be done and why’) and procedural (‘how to do it’). Indeed, previous empirical study has
238 demonstrated skilled decision-making as being a central tenet of high-level adventure sport
239 coaches’ practice (Collins & Collins, 2016b), and identified as being valued by UK mountain
240 leaders (Collins, Carson et al., 2018). As such, the following sections address the key
241 characteristics of the PJDM approach in facilitating the flexibility and adaptability required
242 by the mountain leader.

243 **The Nature and Timing of Decisions**

244 When considering the style of decision-making necessary for mountain leaders, two
245 processes appear useful depending on the nature and context of the decision to be made (cf.
246 Shea & Frith, 2016). One, and the more traditionally researched, is a deliberate, analytical,

247 logical and consciously considered style, what is sometimes referred to as ‘classical decision
248 making’ (CDM; e.g., Thompson & Tuden, 1959). Reflecting such characteristics, CDM can
249 be typified as decisions being well thought through, and so is a viable and effective process
250 for mountain leaders to engage in during the planning process. Practitioners will seek out
251 multiple sources of information or evidence as they try to gain sufficiently deep
252 understanding of the problem and essential presenting issues (Cruickshank, 2013; Martindale
253 & Collins, 2012); for example, mountain leaders may seek out a range of different weather
254 forecasts, condition reports and assess the range of different requirements for any
255 discrepancies. As this understanding is gained, fewer factors are explored in great detail with
256 less important aspects only being considered *if* they impact on the central issues. Several
257 options for action will then be generated and the pros and cons weighed-up, where possible
258 utilising a community of practice comprising of other mountain leaders. Decision-making in
259 this sense is much a case of ‘homing in’ on a solution and then checking by moving from
260 general or broad concepts to more focussed and specific issues.

261 From the perspective of individualised practice, these options will, of course, need to
262 account for the range of factors already identified pertaining to motivations, skill level of the
263 participant(s), etcetera, and so the mountain leader will need to be aware of how these may
264 impact on the activity. An individual motivated to reach a summit will have to be
265 accommodated within a group that may also include individuals who want to find a Snowdon
266 lily. A good understanding of fundamental ‘ologies’ (e.g., pedagogy, andragogy, psychology,
267 physiology) *and* how they interact would be considered highly desirable at this stage
268 (Burwitz et al., 1994). Fortunately, some of this information should be known prior to
269 commencing the activity following consultation with the client, and therefore some planning
270 can take place in advance using this style of thinking. Given sufficient time available,
271 practitioners may even wish to consult on their plan with the client or other colleagues to

272 establish what is most realistic in meeting the desired outcomes and make any refinements as
273 necessary (Collins, Simon et al., 2018). Accordingly, mountain leaders may identify and
274 consider a broad range of aspects of the leadership activity such as predicted changes to
275 weather, anticipated or changing conditions, strategic breaks, the management of energy
276 levels (both physical and psychological), equipment and, equally as crucial, the interactive
277 style and communication with the client(s). The greater the number of clients, length of time
278 inactivity, variability of the terrain etcetera, the more complicated this task becomes. With
279 this cognitive structure (or mental model) in place, however, the mountain leader is afforded
280 greater ease in their ability to adapt the process in relation to this, or another, plan to achieve
281 the intended outcomes. Being aware of multiple possible actions in advance, through the
282 planning process, and the change in situation(s) that would deem each appropriate, makes
283 CDM in practice far more manageable. A recent study has revealed that adventure sport
284 coaches build moments into their plans, or take opportunities as they arrive, to make
285 decisions. This is achieved through manipulation of the task schedule (e.g., selecting a less
286 arduous section of route having identified fatigue within the group) or participant interaction
287 (e.g., working in pairs within a group); the result of these manipulations being a temporary
288 reduction in on-task mental load for the coach (Collins & Collins, 2015). Ultimately,
289 practitioners must account for integrating the time required to think things through and a safe
290 location to do it in. Importantly, the structured planning process provides a basis to evaluate
291 progress and largely know if, what and how any adjustments to pedagogical practices or
292 techniques need to be introduced.

293 Equally, however, there will be circumstances during the activity when a mountain
294 leader needs to make decisions within much shorter timeframes, with less comprehensive
295 information available or when pressured by emotions or the environment. In other words,
296 they may not always have the luxury of time to investigate, consult, audit and deliberate. For

297 instance, the group may face unexpected challenges such as an ice-covered path on a
298 sheltered slope aspect in early spring. Decisions under these situations will, therefore, benefit
299 from processes that are much faster or intuitive and maybe better described as ‘naturalistic
300 decision making’ (NDM; Klein, 1998), or using ‘skilled intuition’. Decisions made using this
301 style are recognised as being more automatic or subconscious in nature and rely less heavily
302 on cognitive resources. It certainly makes sense that an alternative process to CDM is used
303 sometimes to avoid mental fatigue amongst mountain leaders at the very least. For example,
304 the generation of a set of heuristics. As such, the PJDM approach can be understood in terms
305 of needing to deploy an appropriate balance of decision-making styles at different times.
306 During pre and post-activity experience, CDM will be used to a greater extent than NDM
307 (e.g., during debriefs) in planning for and checking progress against longer-term outcomes or
308 goals, whereas the prevalence of NDM will be at its most during the activity, often in
309 response to or when dealing with short-term challenges, ambiguous information and
310 environmental pressures.

311 Notably within the field of intuition research, two processes have been proposed by
312 which fast and pressured decisions are actually made. Recognition primed decision making is
313 explained following previous experience within an environment or situation (Klein et al.,
314 1989). Facilitated by an awareness of the situation and its demands, important and familiar
315 cues are firstly identified and associated with a previous experience using an analytic
316 processes akin to CDM, which, in turn, enables fast ‘intuitive’ access to knowledge stored
317 within long-term memory (Kahneman & Klein, 2009). In contrast, the notion of heuristics
318 and biases (Tversky & Kahneman, 1971) is understood to support fast decision making
319 through use of simple rules of thumb, either passed down as an aspect of ‘coaching craft’
320 (Chow & Knudson, 2011) or developed through reflection on the decision maker’s own
321 experiences. Unfortunately, use of the latter heuristics and biases approach is less likely to

322 reliably resolve complex or novel problems *if* the rule is oversimplified to the extent that
323 meaningful information about the context or outcomes are neglected (Tversky & Kahneman,
324 1974) or the decision-maker has a narrow experience to draw from. Furthermore, application
325 of this approach could possibly result in fatal consequences within the outdoor domain. When
326 such a rule of thumb is misused, it can be said to result in a heuristic trap within the decision
327 making processes and, pertinently for our purpose here, *have* been reported within the
328 mountain context (McCammon, 2004). Whether the decision is recognition primed or
329 heuristically-driven, when used effectively, these processes enable informed actions to be
330 delivered during the activity with greater immediacy and fluency.

331 **Thinking Skills to Assist the PJDM Process**

332 In implementing the PJDM approach, there is a clear need for an underpinning
333 process and mountain leaders will gain much advantage from applying structured higher-
334 order thinking skills. Indeed, these skills are what enable the leader to effectively exercise
335 their knowledge; or in other words, they facilitate effective judgment and decision-making
336 skill. Accordingly, the mountain leader will use ‘macro’ (overarching) cognition during the
337 pre-planning stage to drive the process of design and implementation of the activity. This will
338 entail a projection of future progress towards achieving the desired goal, including: the nature
339 of progress (e.g., ups and downs), what challenges are likely to be faced (i.e., the situational
340 demands; Abraham & Collins, 2011) including how these can be overcome and what can be
341 done to exploit various factors (e.g., weather, conditions, personalities, meal breaks, etc.).
342 When these are understood and contextualised by the mountain leader, it provides a sense of
343 the ‘big picture’ and, therefore an indication of the information necessary to be used from a
344 stored library of knowledge. Importantly, the ability to generate these multiple options and
345 their degree of appropriateness for the activity very much depends on the mountain leader’s
346 level of experience and situational knowledge (Collins, Collins, & Carson, 2016).

347 In enacting the necessary flexibility and adaptability, the mountain leader will deploy
 348 another high-order thinking skill, *metacognition*; defined here as ‘knowledge about and
 349 regulation of one’s cognitive activities in learning processes’ (Veenman et al., 2006, p. 3). In
 350 short, metacognitive skill refers to one’s knowledge for regulating their problem-solving and
 351 learning activities. As such, and based on the CDM process described during the pre-planning
 352 stage, a mountain leader may ensure their actions are rationally derived, as provided through
 353 structures such as:

- 354 • ‘I have decided to . . .[ascend the north ridge]’
- 355 • ‘Because . . .[this provides good views and exciting terrain]’
- 356 • ‘But I considered these options . . .[the eastern gully and the walking path]’
- 357 • ‘And would have taken this alternative if the circumstances were changed to . .
 358 .[higher winds and poorer visibility]’
- 359 • ‘I will check my decision in X months [or at X time] and, if I was right, would expect
 360 to see . . . [my group happy and communicating with each other throughout the
 361 journey]’. (Carson & Collins, 2017, p. 199)

362 In knowing that alternatives need considering and evaluating, this protects against the
 363 unquestionable use of ‘recipe approaches’ that are reported by peers to have worked for them
 364 in a particular (but not always the same) context, or the risk of falling into a heuristic trap.

365 Additionally, the mountain leader will extend the use of metacognition to during the
 366 activity itself, through several on-going reflective checks or audits (i.e., in-action, on-
 367 action/in-context; Collins & Collins, 2015; Schön, 1987). Specifically, these audits serve to
 368 monitor the decision-making process, resulting in greater internalisation of actions within the
 369 decision maker’s repertoire, and therefore ability to finely adjust the mental model as
 370 necessary. Drawing on data from adventure sport coaches, this process of building a
 371 sufficiently broad repertoire of options takes time to embed, as the following quote describes,

372 ‘it’s applying that decision-making process in lots and lots of different situations over lots
373 and lots of years in my case’ (Collins et al., 2016, p. 6). Once internalised, however, a more
374 intuitive style of effective decision making is made possible.

375 Despite the CDM style being (perhaps) the most obvious mode for metacognitive
376 activity in auditing decisions made, research now identifies the nesting (or blending;
377 Kahneman & Klein, 2009) of these decision-making styles across the entire planning,
378 delivery and auditing process involved with the activity that leads to success. Recent data
379 from adventure sport and rugby coaches demonstrate synergistic use of the two styles (CDM,
380 NDM) at times when auditing decisions in-action and on-action/in-context as part of a
381 reflective process (Collins et al., 2016). While coaches in the study by Collins and colleagues
382 may have deployed a naturalistic process during a critical incident—a result of time pressures
383 and incomplete information available—this was then followed by an audit, characterised by
384 CDM mechanisms (but not exclusively). Specifically, the audit acted as a check or way to
385 make sense of the option they had come to select, as the following quote from a rugby coach
386 explains: ‘I decide to do something, say make a substitution, but immediately I’m scanning
387 the decision to see if it feels right’ (Collins et al., 2016, p. 7). However, auditing was also
388 sometimes performed using the NDM style even when the decision process was the same, as
389 the following adventure sport coach ‘described the decisions as needing to “go with your gut”
390 (the primary, let’s retreat decision) while asking a rhetorical question of himself “does this
391 feel right”’ (p. 7). Metacognition during the activity is, therefore, not *always* characterized by
392 CDM processes, but still serves the same purpose to be aware of and check one’s own
393 thinking (cf. recognition primed decision making).

394 Finally, metacognition may also be used post-activity when considering the way in
395 which the decision-making process was carried out; for instance, to ask whether it was right
396 to go with their gut feeling (a naturalistic process) in that case? It may also be appropriate to

397 reflect (a cognitive, not metacognitive process) upon the original intention and whether these
398 objectives were suitable, realistic or flexible enough in light of unfolding events during the
399 activity itself. Thus, the mountain leader is aware of their thinking which feeds back in a
400 circular fashion into their approach to decision making in the future pre-planning, in-action
401 and on-action/in-context scenarios.

402 **Summary**

403 In summary, we have extended recent work on improving the professional practice of
404 mountain leaders to meet the needs on a specific subset of outdoor adventure, hillwalkers and
405 hikers. In doing so, we have exemplified the requirement to understand participation as a
406 personal construct across pre-, during and post-activity periods. Environmentally unclear
407 challenges, where no single best course of action is evident, were also presented and
408 suggested to compound the level of complexity when mountain leaders consider the personal
409 construct alone. Our primary focus was then to provide details on how adaptability and
410 flexibility to meet these challenges could be facilitated to enable greater inclusivity within the
411 outdoors. We have achieved this by suggesting and unpacking the PJDM approach alongside
412 its requisite planning, reflection skills, macro and metacognition. From our perspective there
413 is no simple solution to overcoming the complex issues presented. To achieve this goal, better
414 alignment is required between a sophisticated epistemology and the practical delivery; that is,
415 an epistemological chain (Collins, Collins, & Grecic, 2015). Such alignment could be
416 productively supported through the development of appropriate knowledge, practical and
417 decision making skills and quality reflection on the experience by the mountain leaders
418 (Collins, Carson, & Collins, 2016). Exploration of all these features at an organisational and
419 practitioner level would be a welcomed addition to research in this domain.

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