Sport scientists in-becoming: from fulfilling one's potential to finding our way along

1   Sport scientists *in-becoming*: From fulfilling one's potential to finding our way along

2

3   **Carl T. Woods[1]*, Keith Davids[2]**

4

5   [1]Institute for Health and Sport, Victoria University, Melbourne, Australia

6   [2]Sport and Human Performance Research Group, Sheffield Hallam University, Sheffield, UK

7

8   *Corresponding Author

9   Carl Woods, Institute for Health and Sport, Victoria University, Melbourne Australia

10   Email: carl.woods@vu.edu.au

11

12   **Abstract**

13   It is common to encourage people to envision life as a process of fulfilling their potential. But what

14   exactly does this mean? Traditionally, this question has been addressed by way of 'complementarity'*;*

15   dividing the human into biological and cultural components. Fulfilment is placed on the side of the

16   cultural; an acquisition of encoded secondary information transmitted from predecessors that

17   represents what it means 'to know'. Potential has been defined from the biological, as a suite of innate

18   capacities localised to the mind and body, passed on through a mechanism of genetic inheritance.

19   Founded upon a metaphor of *inter-generational transmission*, this perspective leads to a

20   conceptualisation of life as a progressive closure, 'filling up' the biologically innate with the culturally

21   acquired. However, despite its prominence, this static view leads to a troubling question: *with one's*

22   *potential fulfilled, where is one to go next?* In this theoretical commentary, we offer an alternate,

23   dynamical account of potential and fulfilment by leaning on Ingold's notion of *wayfaring*. From this

24   perspective, life is not a process of being 'filled up' with secondary information, but of 'opening up'

25   responsively; *corresponding* with varied experiences cast forward by others, as they to ours, situated

26   within a continually unfolding field of relations. Ontologically, this view is of 'us', not as beings, but

27   *becomings*, finding 'our' way along generative paths inhabited alongside others. Knowledge is not

28   transmitted inter-generationally, but is grown by primarily experiencing the coming-into-being of

29   things 'we' enter into correspondence with. Initiated through a prologue, these ideas are exemplified

30   in sharing our storied journey as sport scientists in-becoming, following not objects of convention, but

31   corresponding with things of curiosity.

32   **Key words:** Correspondence; Becoming; Knowing; Skill; Information; Wayfinding; Transdisciplinarity

33   "As in life, what matters is not the final destination, but all the interesting things that occur along

34   the way. For *wherever you are, there is somewhere further you can go*." – Tim Ingold (2007, p.

35   174)

36   **Prologue: Carrying on**

37   *"Why are you reading literature in anthropology?"* is a question I (the first author) am routinely asked.

38   After all, I underwent traditional training as a sport scientist. My typical response to this question is

39   *"why should I not?"*. Indeed, I did not plan or set out to be 'here'. Rather, I have been following various

40   lines of inquiry in their unfolding; lines that have ebbed and flowed in response to questions that have

41   jagged my attention along the way. These are questions which often have no answer, carrying on

42   through the various places in which they lead me. What can be said, then, about the works written

43   with colleagues in response to such fundamental questions? Adopting an Ingoldian perspective, these

44   works are not so much disciplinary articles with starts and ends, but knots entangled along a path of

45   continual growth. These knots have off-shooting ends that others may or may not want to pick up and

46   run with while moving along their path of growth (Woods & Davids, 2022). Otherwise stated, these

47   knots are *places*[1] in which I have pitched my tent, pausing to join in conversation with others, all the

48   while keeping a responsive ear and eye directed toward an undetermined future (Woods et al.,

49   2022a). Because of this, knowledge of my surrounds has not as much been acquired over the years,

50   but grows in moving from place to place (Woods et al., 2022b).

51   As implied by the opening question, I guess I now find myself rather far from 'home', dwelling where

52   many sport scientists typically might not. Recently, I have been considering what this would mean for

53   my 'potential' as a sport scientist if it were to be adjudged based on its 'fulfilment'? If I am not where

54   a sport scientist is 'supposed' to be, then some may think me considerably lost, stumbling through

55   places that are unfulfilling relative to my potential *as* a sport scientist. Needless to say, I firmly disagree

56   with such disciplinary territorialization, and feel it is an artefact of a rather archaic, superficial

---

[1] See Ingold (2011, ch. 12) for a detailed account of *places as knots*.

57 perspective of what it means to fulfill one's potential. I have never felt lost in the sense that I should

58 be moving across a pre-determined disciplinary route leading toward a defined point of fulfilment *as*

59 a sport scientist, so much as *wayfaring along an ongoing path of observation* (Ingold, 2007), following

60 the various things that spark my curiosity, weaving them together as best and as carefully as I can

61 (Woods et al., 2021). Maybe it would be better to think of such a voyage, not fulfilling my potential *as*

62 a sport scientist, but of continually finding my way. Best, then, I carry on.

63 **Introduction**

64 In many parts of society, it is common to encourage people to envision life as a sequential process of

65 fulfilling their potential. But what exactly does this mean? In Western scientific thought, such a

66 question has typically been addressed by way of 'complementarity': dividing the human into separate,

67 but complementary parts related to the biological and the cultural (cf. Ingold, 1998; 2000; 2004; 2011).

68 Potential is placed on the side of the biological: a suite of innate capacities, localised to the mind and

69 body, passed on through a mechanism of genetic inheritance (Ingold, 2000, ch. 6). Fulfillment is

70 located on the side of the cultural: pre-packaged, second-hand information transmitted into the minds

71 of others, encoded in rules, symbols, representations and systems of classification that provide

72 operational specifications for what it means 'to know' in order 'to function *as*' (Geertz, 1973; cf. Ingold,

73 1998, 2004; Sperber, 1996). Thus, fulfilling one's potential, according to the principle of

74 complementarity, is quite literally a process of 'filling up' the biologically innate with the culturally

75 acquired (Sperber, 1996).

76 Despite its prominence within various academic disciplines, such as anthropology, psychology and

77 sport science (cf. Davids & Araújo, 2010; Dawkins, 1999; Geertz, 1973; Kashima, 2008; Maslow, 1970;

78 Narvaez, 2018; Sperber, 1996; Tooby & Cosmides, 1992), this principle has not been without criticism

79 (Bouzenita & Boulanouar, 2016; Ingold, 1998, 2000, 2004; Isham & Jackson, 2022). Generally, such

80 critiques have targeted its determinist, individualist, asymmetric and reductionist undertones, leading

4

81   some toward a more relationally dynamic account of potential and fulfilment. Anthropologist Tim

82   Ingold (1998), for example, argued that:

83   "[…] the human being is not a composite entity made up of […] body, mind and culture, but rather

84   a singular locus of creative growth within a continually unfolding field of relationships" (p. 23).

85   The forthcoming conceptualisation of human behaviour, focused on potential and fulfilment, is

86   critically aligned in a similar way. In this paper, we situate 'being' within Gibsonian ecological realism

87   (Gibson, 1979; Reed, 1996), allowing us to frame it in *relation* to ongoing changes in environing

88   conditions (Heft, 2013). Gibsonian ecological realism is fundamentally anti-representational in its

89   account of behaviour, specified not indirectly by second-hand content localised to the mind (termed

90   knowledge *about* the environment), but by an embodied perceptual system attuned to the 'pick up'

91   of information that directly specifies information for affordances (opportunities for action) *with-in* a

92   richly structured environment (Gibson, 1979; Reed, 1996; Heft, 2013). This signifies that 'knowing' is

93   not a matter of a mind imposing structure on a static world, but of *actively finding* structure in a

94   dynamic, unfolding field of relations (Heft, 2013; for more details see Woods et al., 2020).

95   To elaborate on these ideas, we introduce Ingold's (2007) notion of *wayfaring*. Life, it will be

96   suggested, is not a sequential point-to-point progression of mechanistically 'filling up' innate

97   capacities with representational content transmitted by predecessors. But is an active process of

98   'opening up', finding our way along a generative path of growth by *corresponding* with the varied

99   experiences of others – as they to ours – encountered along the way (Ingold, 2000; 2011).

100   Correspondence, in the sense presented here, differs to that of interaction. According to Ingold (2016),

101   where the latter goes back and forth transversally, the former *goes along with longitudinally*.

102   Interaction, then, could be understood as the oscillation between two pre-exiting and bounded ends,

103   whilst correspondence is a multilinear binding of lines joined in the middle (Ingold, 2016). This means

104   that in correspondence, ends are not provided in advance, but emerge "only in the acknowledgement

105   of *new beginnings*" (Ingold, 2016, p. 18, emphasis added). Otherwise stated, ends are not terminals

106   or nodes in a networked connection that closes in on itself, but are moments in a meshwork that are

107   continually formed in moving from place to place (Ingold, 2007).

108   There are epistemological corollaries to the argument presented here, with clear implications for

109   understanding human potential and fulfilment. Notably, knowledge is not conceived as a corpus of

110   secondary information transmitted inter-generationally, waiting to be applied in practice. But is *grown*

111   *by way of practice*, by primarily experiencing the coming-into-being of things 'we' enter into

112   correspondence with (Ingold, 2011, ch. 12-14). Knowledge, in other words, is not tantamount to

113   concept categorisation and classification, denoted through the ascription of labels to objects, but is

114   *storied* in the tangled coming-into-being of things we go along with (Ingold, 2011, ch. 14). This

115   ecologically dynamic perspective implies that we (i.e., sport scientists) are not moving toward a pre-

116   determined point of fulfilment (i.e., 'an ends') through the consumption and application of

117   transmitted, secondary information specifying *for* us *about* what it means 'to be'. But are rather

118   *wayfaring along an ongoing path of participant observation[2], suspended in correspondence with*

119   *others*. These theoretical ideas are exemplified in the shared experiences initiated within our prologue

120   and sections thereafter. Moreover, they foreground an ontological departure from the common

121   pronominal accounts of what it means to fulfil one's potential (see Narvaez, 2018), pushing against

122   the labelling of humans 'as', in favour of one that situates 'us' in a perpetual state of *becoming-with*.

123   **Potential fulfilment and the genealogical model**

124   In the second chapter of his seminal text *The Interpretation of Cultures*, anthropologist Clifford Geertz

125   proclaimed:

126   "For man [*sic*], what are innately given are extremely general response capacities, which, although

127   they make possible far greater plasticity, complexity, and, on the scattered occasions when

---

[2] Our phrasing here can be traced to Gibson's (1979/2015) ecological approach to way-finding. "An observer who is getting around in the course of daily life", Gibson (1979/2015, p. 188, emphasis in original) argued, "sees from what I will call a *path* of observation". This 'can be thought of as a unitary movement, an excursion, a trip, a voyage that can last over short (minutes, hours) or long (days, weeks, years) periods' (Ibid., paraphrased).

128   everything works as it should, effectiveness of behaviour, leave it much less precisely regulated.

129   […] Undirected by culture patterns – organized systems of significant symbols – […] behaviour

130   would be virtually ungovernable, a mere chaos of pointless acts and exploding emotions" (1973,

131   p. 45-46)

132   This statement reflects a long-held tradition within Western scientific thought echoing that of

133   potential fulfilment. It views the human as a composite entity existing in two separate, parallel worlds:

134   the biological (emphasising "general response capacities") and the cultural (emphasising "organized

135   systems of significant symbols"). In the former, an individual is 'given' *innate* capacities by way of

136   genetic inheritance. In the latter, these capacities are 'filled' with *acquired* content passed on by

137   predecessors (Ingold, 2000). Within the corpus of acquired content are specifications for knowing how

138   to regulate behaviour effectively. Grounded in a metaphor of *inter-generational transmission* (Ingold,

139   2011; Lave, 1990), this is to posit that pre-existing biological capacities underwrite and define all

140   potential for subsequent learning and knowledge acquisition (for an overview of this in the sport

141   sciences, see Davids & Araújo, 2010).

142   Differing to the biological, the transmission of cultural content is non-genetic (Ingold, 2011; Lave,

143   1990). It is purportedly established through some type of direct instruction founded upon the

144   acquisition of rules, symbolic representations and classification systems that are stored in the mind

145   and believed to dictate the functioning of already knowledgeable others (also see Maslow, 1962, p.

146   4). This ideology reflects what Jean Lave (1990, p. 310) refers to as "the culture of acquisition", in

147   which learning is understood sequentially. First, one acquires a body of transmitted knowledge in the

148   form of rules and representations (i.e., 'culture'), and then one uses such knowledge to construct an

149   action to be 'properly' applied in practice. It is to imply that learning is context-free, internalised and

150   generalizable – or in a word, is tantamount to a process of *enculturation* (Ingold, 2000). Thus, while

151   humans supposedly exist in two parallel worlds, they enter life into a "gap", a vacuum "[b]etween

152   what our body tells us and what we have *to know* in order *to function*" (Geertz, 1973, p. 50, emphasis

153   added). What fills this gap, is the transmission of "information (or misinformation) provided by

154   culture" (Geertz, 1973, p. 50).

155   This view follows the logic of what Ingold (2000, p. 134-139) refers to as the "genealogical model"; an

156   assumption that individuals are independently pre-specified by way of their genetic and non-genetic

157   constitution. Fulfilling one's potential, in following such a model, could be surmised as a point-to-point

158   sequence of instants, starting as an innate capacious *organismic* container, whose 'being' is pre-

159   written within a genomic code; ending as a *person* filled with acquired representational content

160   specifying what it means 'to be' (Sperber, 1996). This perspective leads to an appreciation that by

161   addressing components of the biological (i.e., organismic) and cultural (i.e., person) separately, we are

162   only able to ascertain a partial view of the human individual (Ingold, 1998). To glean an account of the

163   whole, we must *add* these component parts together. It is to "assert that the human being is not

164   merely a biological organism nor merely a social person, but the compound of one thing *plus* the

165   other" (Ingold (1998, p. 24, emphasis added).

166   To exemplify, one could argue from the biological premise that all humans possess an innate

167   organismic potential 'to be' a sport scientist. But the expressive and interpretative value associated

168   with being such would reside within cultural specifications coded in the rules, representations and

169   classification systems transmitted into one's receptacle mind by governing bodies, institutions,

170   organisations, or groups of senior sport scientists themselves. These specifications, according to such

171   a transmissive model, would supposedly provide a person with the knowledge needed in order to

172   fulfill their potential *as* a sport scientist, perhaps reflected in the texts one must read, the stylistic ways

173   in which one must communicate research, the methods one must apply, the topics one is allowed to

174   explore (and by default, those which are out of bounds), and the reasoning of others which one must

175   follow. Accordingly, while the potential to be a sport scientist may be biologically universal, its

176   fulfilment is represented in the cultural specifications acquired. That is, the accumulation of secondary

177   information specifying *for* one *about* what it means 'to know' in order 'to function' *as* a sport scientist.

178 This, we suggest, is to *script one's life*; mapping where one is against prior-established conventions

179 that dictate where they (putatively) should be.

180 Though, in following this model of potential fulfilment, we quickly encounter some problematic

181 implications. The first is the presumption that human existence is founded on two parallel worlds: the

182 biological (potential / organism) and the cultural (fulfillment / person). In reality, there is only one

183 world (Ingold, 2018), and *all* inhabit it (Gibson, 1979, p. 130 ff.). This is a world co-determined by

184 actions of inhabitants, which from an ecologically dynamic rationale, are reciprocally shaped by those

185 of others (Heft, 2007; Lave, 1990; van Dijk, 2021). Indeed, we are not denying that humans inhabit a

186 world with signs, pictures, words and systems of classification. Nor that genomes circulate

187 multicellular matrices within all organic matter, including humans. Our argument is that such things

188 *do not* pre-determine, nor specify, what it means for one 'to be', as if such things are encoded with

189 information waiting to somehow be decoded by a passive recipient. Such pre-determinism disregards

190 the key idea that *context is everything* (Juarrero, 2023). Instead, human behaviour continuously

191 emerges as a relational property within the dynamic constraints of the environment and tasks people

192 undergo through the lifecourse (Juarrero, 2023). The complementary, transmissive model, thus fails

193 to account for the *ontogeny of human development* (Oyama, 1985): how humans grow in richly

194 structured environments that continually come-into-being-with-others (Ingold, 1998; 2004; 2015, ch.

195 23; Thelen, 1995). Stated differently, if life was to be lived as a progressive filling up of an 'information

196 gap' (see Geertz, 1973, p. 50), how *responsive* could one be to the varying experiences of others

197 encountered along the way? Would they not be destined 'to be' what was pre-specified for them, first

198 by way of genetic inheritance, and then by way of cultural transmission? If this were so, how would

199 one find their way through events 'off-script'? After all, as Ingold and Hallam (2007, p. 12) emphasise,

200 a system strictly bound to the execution of a pre-specified plan would be unable to *respond*, being

201 thrown off course by the slightest perturbation.

202 This points us toward the second problem of such a model: its presumption that knowledge *pre-exists*

203 its practical engagement with the world. If true, knowing would have to be tantamount to

204 *classification*; a view aligned to the *complex-structure* metaphor introduced by David Rubin (1988).

205 According to such, knowledge is viewed as the instillation of a concept or representation determined

206 prior to its application in various contexts (see Woods & Davids, 2022, p. 6). Meaning that for one 'to

207 know', they must be able to establish some type of match between the representation transmitted

208 and the object that is of concern in their surrounds. It is to imply that knowledge:

209   […] takes the form of a comprehensive configuration of mental representations that has been

210   copied [transmitted] into the mind of the individual, through some mechanism of replication, even

211   before he or she steps forth into the environment. The application of this knowledge in practice

212   is, then, a simple and straightforward process of sorting and matching, so as to establish a

213   homology between structures in the mind and structures in the world" (Ingold, 2011, p. 159, text

214   in brackets added)

215 This leads to a pre-determined view of the world, static and complete, filled with objects waiting to

216 be known about by way of classification into prior formed disciplinary frameworks or familiar classes.

217 Though, as eloquently shown by sociologist of science David Turnbull (2008), it is not enough to know

218 by applying systems of classification onto similar tasks, given changes in environing circumstances,

219 even in strictly controlled laboratory settings. Specifically, Turnbull (2008) noted the difficulty

220 scientists had in attempting to recreate the TEA laser developed by Bob Harrison in the late 1960s

221 using only published methodologies and other sources of secondary information purportedly

222 describing its procedures. This is because what had not been considered in such secondary

223 information were the effects of locally nuanced differences between distinct laboratory settings in

224 which the procedures were being applied. For this very reason, it was not enough for the scientists to

225 proclaim 'to know' simply by possessing the methodology. Doing so, according to Blumberg and

226 Wasserman (1995), would be to commit the 'nomological fallacy': believing that naming and

227   classifying something is tantamount to knowing and explaining it. Acquiring a recipe, in other words,

228   does not mean one can actually *cook* a meal, in much the same way acquiring a map does not mean

229   one actually *knows* the terrain. Such a sentiment is heeded by the words of philosopher of science

230   Joseph Rouse (1987, p. 72), who proclaimed that "[s]cience is first and foremost knowing one's way

231   about in the laboratory (or clinic, field site)". Stated differently, one has to learn to actively participate

232   within their surrounds before procedures, rules or systems of classification can be applied. Discussed

233   in the following sections, this viewpoint encourages a shift from the transmissive model of potential

234   fulfilment, toward a more generatively relational account of what it means to find our way along. To

235   start this shift, we pick up from Turnbull's observations, contending that knowing is not established

236   before we go, waiting to be applied in practice, but is grown *as* we go, in moving from place to place.

237   **To know**

238   In advocating against complementarity, Ingold (1998) introduced the principle of 'obviation'. This

239   principle, as its starting point, situates humans as *both* biological and cultural, constituting a locus of

240   ongoing growth within structured environments inhabited alongside others. Humans are not, in other

241   words, 'organism' (biological) *plus* 'person' (cultural), but are "*organism-person* within a nexus of

242   environmental relations" (Ingold, 1998, p. 26, emphasis added). By doing away with the biological and

243   cultural dichotomy associated with complementarity, the principle of obviation eschews the inter-

244   generational transmissive metaphor, as it is not the 'passing on' of innate and acquired content that

245   specifies what it means 'to be'. Rather, 'being' is ongoing and ever-emergent, resultant from complex,

246   dynamic and self-organising relations established and sustained with others (Oyama, 1985, also see

247   Ingold, 1998, p. 25). "Real people", Ingold and Hallam (2007, p. 6) contend, "continually create

248   themselves and one another, forging their histories and traditions as they go along". If anything is

249   'transmitted', it is the alignment of one's perception to the movements of a more experienced

250   companion adaptively finding their way through the ebbs and flows of various tasks. Thus, what

251   fosters one's coming-into-being is not the backward reading of a transmitted code or representation,

252   but the *forward reading of activity joined with*.

253   To exemplify, humans are indeed not born readily to be sport scientists, nor any other role. These

254   skills are continually learnt, oft under the guidance of experienced companions while situated within

255   a structured environment affording opportunities to partake in such practice. It is biological, as one's

256   actions when partaking in such practice are part of their form of life as a human. And it is cultural, not

257   because its expressive value is adjudged based on a corpus of secondary information passed on from

258   predecessors, specifying what it means 'to know *as*'. But because such practice unfolds in *response* to

259   the presence and experiences of others within dynamic environments (Woods & Davids, 2022).

260   Simply, it is not the transmission of genetic and non-genetic information that creates the essence of

261   what it means 'to be' a sport scientist, but an *ongoing co-respondence with others encountered along*

262   *the way* (Woods et al., 2022a). Following this line of thinking would mean that 'being' a sport scientist

263   has no pre-determined end, no point of fulfilled potential. It would rather *carry on*. Knowing, then,

264   would be to primarily experience things in-becoming, watching, listening, and feeling while moving

265   along, together.

266   In contrast to the *complex-structure* metaphor, this aligns to what Rubin (1988) referred to as a

267   *complex-process* metaphor. People, according to such, do not apply their knowledge in practice by

268   way of classification, so much as *know by way* of their practice, joining with the activities of more

269   experienced companions to see, feel, hear, taste and smell things for themselves[3]. In his seminal text

270   *Art as Experience*, John Dewey (1934/2005) drew similar lines. For one to *really* know that which is of

271   concern, Dewey contended, they need to "begin with it in the raw; in the events and scenes that hold

272   the attentive eye and ear […] arousing interest and enjoyment as one looks and listens" (p. 3). Dewey's

273   example was that of a plant, arguing that if one wanted to know its flowering tendencies it would not

274   be enough to simply *recognise* its features: matching what was looked at against a prior formed

275   scheme representing it. For in doing so, one would risk moving toward a narrowing point in which

---

[3] In the chapter *The Culture of Acquisition and the Practice of Understanding*, Jean Lave (1990) refers to this as "understanding in practice". Knowing, according to this perspective, occurs "in situations whose specific characteristics are part of the practice as it unfolds" (p. 19).

276 there is nowhere further to go; occupying a world of *objects* that have all been categorised away into

277 their pre-specified familial classes. The caveat to such a view is that we do not occupy a created world

278 of objects, but *inhabit a crescent world of things* (Heidegger, 1971; Ingold, 2011; 2015, ch. 3; Woods

279 & Davids, 2022). The difference between these statements is critical to our theorising, and requires

280 elaboration before carrying on.

281 First, the contrast between 'occupancy' and 'inhabitation' relates to the extent of correspondence

282 between the observer and the observed. For example, the former implies a distance, a removal in

283 which one documents and records features from afar, being careful not to engage with what the

284 observed has to say. In the sport sciences, such occupancy is common in research practices that follow

285 the hypothetico-deductive theory of scientific method, manifest in researchers focusing on data

286 collection or recorded observations used to 'prove or disprove' hypotheses determined *a priori*

287 (Woods & Davids, 2022). There is little room in such an approach to *listen* to the storied coming-into-

288 being of what is observed, viewed instead as an 'object of analysis' waiting to be classified away[4].

289 Conversely, inhabitation is deeply immersive, in which an observer actively participates within the

290 broader ecology of the observed, knowing by way of *participant observation*[5]:

291   "[…] to the *occupant* the contents of the world appear already locked into their final forms, as

292   though they had turned their backs on us. To *inhabit* the world, by contrast, is to *join in* the process

293   of formation." (Ingold, 2013, p. 89, emphasis in original and added)

294 Second, the referral to a 'created world' imbues a view of a static surround, in which everything

295 encountered is already locked into its final form, independent of its engagement with everything else.

296 This is a world of 'objects', fixed and bounded; facts waiting to explicated by way of classification. A

---

[4] This is especially noted in research that ascribes the label of 'talent' to youth sports participants based on deterministic models of 'identification' and 'development'. See Ribeiro et al. (2021) for a detailed overview of such criticisms.

[5] For a detailed overview of participant observation as a way of knowing in sport science, see Woods and Davids (2022).

297 'crescent world', however, is dynamic, suspended on the cusp of becoming. It is a world replete with

298 'things' that are "always in the making" (Jackson, 1996, p. 4):

299   "The thing about *things*, is that far from standing before us as fait accompli, complete in itself,

300   each is a 'going on' – or better, a place where several goings on become entwined […] It is a

301   gathering together of *materials in movement*." (Ingold (2011, p. 315, emphasis added)

302 How one comes to know 'things' in a 'crescent world' is not by way of classification based on a corpus

303 of transmitted secondary information, but by *directly perceiving* and *primarily experiencing* the very

304 conditions that sustain its ongoing growth; seeing, smelling, tasting, feeling and hearing what it has to

305 share (Dewey, 1934/2005; Gibson 1979/2015). It is, in other words, to join with the generative

306 conditions of life (Ingold, 2016), appreciating that every-*thing* we encounter and directly perceive, is

307 some-*thing* on its way to becoming some-*thing* else, 'us' included. A wonderful example of this in

308 science is noted in the work of biologist, Barbara McClintock[6]. By moving from an occupant with an

309 organism-centric focus, toward an inhabitant focusing at the ecological scale of the organism-

310 environment relation, McClintock made seminal, paradigm shifting discoveries in the field of biology.

311 This manifest in McClintock 'not pressing nature with leading questions, but dwelling patiently with-

312 in the complexity and variety of organisms […]. What for others was interpretation, or speculation,

313 [for McClintock], was a matter of trained *direct perception*' (Henry, 1997, p. 158, paraphrased).

314 Appreciating this, it would not be enough for a sport scientist to proclaim 'to know' by way of enacting

315 secondary information specifying *for* them *about* what it is they are *looking at*. Rather, they would

316 need to join with the broader ecology of what sparks their curiosity, following along in correspondence

317 (Camiré, 2022; Despret, 2013; Woods et al., 2022a). This process would be to grow with and into one's

318 knowledge by finding their way along a *path of participant observation*, a path that *opens up* and

---

[6] For a detailed recount of McClintock's seminal work and approach to inquiry, see Henry (1997).

319 *carries on* in response to others (Morris et al., 2022). Given this open-endedness, how would such an

320 epistemological shift implicate our understanding of potential and fulfilment?

321 **Finding our way along**

322 Recall within our prologue, I (the first author) spoke of how some within my homely discipline of sport

323 science may consider me lost, perhaps even dwelling in places that sport scientists are typically not

324 seen. To this, I responded in the negative, emphasising that I – along with colleagues – have simply

325 been following the scent of things that have sparked our curiosity, moving through the various places

326 in which they have led. Such a journey is less about fulfilling our potential *as* sport scientists, and more

327 of continually finding our way, creatively improvising a path ahead by corresponding with the coming-

328 into-being of things encountered. This is a journey captured by what Tim Ingold (2007, p. 78) refers to

329 as *wayfaring*.

330 To start, it is worth briefly contrasting wayfaring to transport, as the two are ontologically and

331 epistemologically distinct. Transport is *destination-oriented*; it starts with an end in mind (Ingold,

332 2007). The journey in-between is simply a means to an end, a mode that carries one *across* in order

333 to arrive *at*. For example, when one sits on a train to reach a destination oft established before they

334 leave the station, the journey is typically of little concern, with the train transporting the passenger

335 across the landscape on the shortest possible route to reach their destination in the fastest possible

336 time. Location, during such moments of transport, is commonly specified *for* the passenger by some

337 type of indirect, augmented information – perhaps gleaned from timetables, announcements, a map,

338 or a global positioning device – that updates them *about* their current position relative to the

339 coordinates of a pre-determined route or destination (see Gell, 1985, p. 280). Given this point-

340 indexicality (Woods, 2021), knowledge could be understood in a similar way to that denoted by the

341 *complex-structure* metaphor: knowing where one is by matching their position relative to a pre-

342 established point in space. Transport can, therefore, be epistemologically aligned to the genealogical

343 model of potential fulfilment: potential being where one starts their journey, fulfilment being the pre-

344 determined end they navigate toward by following the rules, representations and systems of

345 classification that specify *for* them *about* where they *should* be. It is a view surmised by Edwin Hutchins

346 (1995, p. 286):

> 347 "When the navigator is satisfied that he [*sic*] has arrived…he [*sic*] might look to the chart and say
>
> 348 'Ah, yes; I am here, off this point of land.' And it is in this sense that most of us feel we know where
>
> 349 we are. We feel that we have achieved reconciliation between the features we see in our world
>
> 350 and a representation of that world."

351 Wayfaring, comparatively, is *journey-oriented*; there is no end in mind, no terminus to be destinated,

352 no potential to be fulfilled. It is open-ended, with the wayfarer continually being on the move, or as

353 Ingold (2007, p. 78) eloquently surmises, they *are* their movement. Far from being a static space to be

354 transported across, the environment to the wayfarer is a dynamic place to *move along with*, sustained

355 by corresponding with that which sparks their curiosity (Ingold, 2007, p. 78). Accordingly, in contrast

356 to transportation, where location and movement are mediated indirectly, it is the attunement of the

357 wayfarer's movements in *response* to the informational ebbs and flows of events in an environment

358 that affords the opportunities for them to carry their voyage on (Ingold, 2000). There is no mentalistic

359 separation between the deeply integrated wayfarer and the environment they inhabit, which means

360 that the more dynamic and richly variegated the environment, the easier it is for the wayfarer to

361 directly perceive the changing layout and find their way through. After all, in an environment "where

362 nothing moves there is nothing to which one can *respond*" (Ingold, 2000, p. 242).

363 In contrast to the transmissive genealogical model, we propose wayfaring as an alternate description

364 of one's journey in-becoming, citing four key principles. First, it is *generative*: giving rise to form as

365 people creatively improvise a path ahead. Second, it is *relational*, sustained co-responsively with and

366 alongside others. Third, it is *temporal*: carrying on in rhythmic procession guided by the tight coupling

367 of perception and action. Fourth, it is *animated in what we 'do'*: manifest in the dexterous practice of

368   everyday tasks[7]. Each principle, discussed next, is exemplified through our journey as sport scientists

369   in-becoming.

370   *Wayfaring is generative*

371   Since it is journey-oriented, wayfaring always overshoots destinations (Ingold, 2011). In fact, as the

372   world is crescent, suspended in-becoming, destinations are somewhat indeterminable, always open

373   to possibility. Finding one's way is not a matter of passively following a script or route laid down by

374   another, but is "to advance along a line of growth, in a world which is never quite the same from one

375   moment to the next, and whose future configuration can never fully be known" (Ingold, 2000, p. 242).

376   Given this dynamism and indeterminacy, wayfaring requires "a good measure of *creative*

377   *improvisation*", forging a path ahead by attending directly to things as they occur (Ingold, 2011, p. 162,

378   emphasis added). Do not misread us here: people do follow the actions of more experience

379   companions, and they may even follow methodologies, recipes or sets of instructions when

380   attempting to learn particularly unfamiliar tasks. Our contention, though, is that it is not the passive

381   following of a script laid down by another that regulates a wayfarer's behaviour, but their ever-

382   emergent attentive responsiveness to the movements of others within dynamic environments (Woods

383   et al., 2020). Following another's movement, otherwise stated, is a way to help orient oneself toward

384   the pick-up of key specifying information, which means that the skill of the wayfarer resides not within

385   mindless autonomation, but in the actively tight coupling of perception and action (Gibson,

386   1979/2015).

387   To exemplify, I (the first author) am a less experienced academic sport scientist to that of my co-

388   author. This means I often find myself observing the ways in which they skilfully undertake various

389   tasks, like responding to reviewer comments when publishing academic works. This observation is *not*

390   an emulation or replication of 'the' way one 'must' respond, as if residing beneath what is being

---

[7] We have drawn inspiration for this section from the opening chapter of *Creativity and Cultural Improvisation*, written by Tim Ingold and Elizabeth Hallam (2007). While these authors situate 'improvisation' beneath similar principles, to us, they equally relate to wayfaring given their ecological grounding.

391　observed is a representation waiting to be decoded, specifying *for* me *about* how to undertake such a

392　task. Rather, by observing them closely in practice – seeing and hearing them work – I am educating

393　my attention[8] toward the specifying information they are attuned to, allowing me to align my

394　perception to the dynamics of the task, as they do. In this way, they are offering guidance *without*

395　specification (cf. Woods, 2021), a sentiment eloquently captured by Reed (1996):

396　　　"Our guide *does not transmit* ideas to us, nor does she impose certain ways of thinking upon us. A

397　　　good mentor helps us *learn things for ourselves*, to learn to attend to the available information"

398　　　(p. 113, emphasis added)

399　Though, just as the world is never settled, no two reviewer comments are ever the same, which means

400　that even as the task becomes more familiar to me, I still have to adaptatively find a way forward,

401　creatively improvising a path by adjusting how I respond to insights cast forward by the reviewer. This

402　is not autonomous, nor mindless, but requires a carefully attuned perceptual system trained toward

403　the 'pick up' of information that guides the way forward. Accordingly, as no two tasks, no matter how

404　similar or familiar, are ever the same, the form of things – like a reviewer response letter – emerge as

405　people creatively improvise a path ahead, guided not by a transmitted representation, but by a trained

406　perceptual system (Gibson, 1979/2015).

407　*Wayfaring is relational*

408　Following along from the above, wayfaring is not indirectly regulated by a series of transmitted

409　representations. It is achieved *directly* through the attunement of one's entire perceptual system to

410　ongoing changes in environing and task dynamics (Ingold, 2011; Gibson, 1979/2015). More

411　specifically, through *responding* to such changes, wayfarers open up the possibility of carrying on.

412　Elsewhere, we have explained this responsiveness through the intransitive verb 'commoning' (Woods

413　et al., 2022a, also see Ingold, 2018, and Menzies, 2014). People, in following this relational concept,

414　do not start life innately 'having in common'. Instead, it is an aspiration, something people continually

---

[8] See Gibson (1979/2015) and Ingold (2000).

415 strive toward through a responsiveness directed toward various experiences cast forward by others.

416 It is a process, according to Ingold (2018, p. 38, emphasis added), that entails:

417   "[…] an attentive stretch whereby every participant casts their experience forward in ways

418   they can answer to the experiences of others, and they likewise, so as to achieve a

419   *correspondence* that goes *beyond* what any of them could have imagined at the outset".

420 As implied in the above excerpt, corresponding dissolves ends into new beginnings, opening further

421 opportunities for people to carry their lives on with one another. Differing to the verticality of

422 interaction detailed earlier, correspondence follows what Ingold (2016, p. 18) refers to as a

423 longitudinal directionality. Think, for example, of people walking side-by-side while immersed in

424 conversation. The flow of this correspondence literally moves longitudinally, carrying on for as long as

425 the conversation is sustained. Indeed, such conversations do come to an end, though these ends are

426 not points of closure, but of openness. This is because the doing of a conversation always overflows,

427 in that we are a somewhat different person upon entering into the next (Dewey, 1966). Contrast this

428 to a face-to-face interaction where people talk at and to one another, as if in debate. Ends, in such

429 moments of interaction, are oft pre-established based on a pre-determined agenda (see Ingold, 2016).

430 It is best to think of correspondence more harmonically, with participants attempting to resonate with

431 one another by casting experiences forward. This means that as one makes their way through the

432 world, corresponding with the experiences of others, they actively contribute to the very conditions

433 that sustain growth by casting forward their experiences in ways that can resonate with another

434 (Woods et al., 2022a). This means that for the wayfarer, there would be nowhere further to go if there

435 was no-*thing* for them actively correspond *with*. Stated differently, in a static, homogenised

436 environment in which varied experiences remain uncast, there would be nothing to which one could

437 resonate (Ingold, 2000).

438 Take this very paper. It was not activated mechanistically, as an isolated, disciplinary idea housed to

439 my (the first author's) mind, waiting simply to be written up by a passive body. It progressively

440   emerged as *we* (both I and the co-author) conjoined our varied experiences, cast forward in responsive

441   ways over prolonged periods of correspondence. Where we find ourselves now is a place somewhat

442   unscripted and uncharted, as rather than starting with an 'end in mind' to which we navigated toward

443   through interaction, we have been following the inquiry together in its unfolding, creatively

444   improvising a path by selectively responding to the various experiences shared along the way. By

445   default, then, this paper has no start (i.e., potential), nor end (i.e., fulfillment). It is an ongoing inquiry

446   issuing forth along a line of harmonic growth that is sustained by the conjoining of experiences forged

447   in correspondence. Wayfaring, in sum, is relational, *precisely because it can only carry on in*

448   *correspondence with and alongside others.*

449   *Wayfaring is temporal*

450   In the genealogical model of potential fulfilment, life is surmised as a point-to-point sequence of

451   instants, rooted in the metaphor of inter-generational transmission. This perspective is a process of

452   replication, a backward reading of movement regulated indirectly by secondary information. Indeed,

453   there is a temporality associated with such a model, a metronomic kind where people are destined to

454   replicate that which has been transmitted to them by those gone before. The problem of

455   understanding temporality in such a way is that in a crescent world of things that are never settled

456   and always open to possibility, replication would have to be *imperfect*. "No repeating system in the

457   living world can be perfect", Ingold and Hallam (2007, p. 10, emphasis added) state, "and it is precisely

458   because imperfections in the system call for continual correction that *all repetition involves*

459   *improvisation*". For this reason, the temporality of the wayfarer is not metronomic, connecting up

460   points in a sequence of interactive transmission, but *rhythmic*, issuing forth along a line of growth in

461   which activity is harmonically read *forward* through the tight coupling of perception and action (Ingold

462   & Hallam, 2007). Following philosopher Henri Bergson (1911, p. 4-5, emphasis added), this rhythmic

463   temporality can be understood as *duration*:

464   "Our duration is not merely one instant replacing another; if it were, there would never be

465   anything but present – no prolonging of the past in the actual […] Duration is the *continuous*

466   *progress* of the past which gnaws into the future and which swells as it advances".

467   Life, for the wayfarer, is an ongoing rhythmic movement. A duration in which experiences undergone

468   are bound together while simultaneously cast out along a line of growth, directed toward an

469   undetermined future. As an aside, given its grounding in ecological realism, time for the wayfarer is

470   not directly perceived, but events and locomotions are (Gibson, 1979/2015). This perspective

471   contrasts with conventional understanding of time in the physical sciences as flowing equably,

472   independent to anything else. To the wayfarer, though, events do not occur in space, but in the

473   medium of an environment that affords varying opportunities for action (see Gibson, 1975, p. 295).

474   Events should be thought of here as 'primary realities and time as an abstraction for them, not, as

475   convention would have it, the other way around' (Gibson, 1979/2015, p. 93 paraphrased). This nuance

476   helps us to appreciate that the undergoing of events experienced *overflow*, in the sense that whatever

477   the wayfarer does next will be shaped by that which they have already undergone (Dewey, 1966).

478   Indeed, there is a repetition associated with this duration, but echoing the words of Nikolai Bernstein

479   (1967, p. 234), it is a 'repetition *without* repetition': meaning, the wayfarer's search for behavioural

480   solutions is *guided* by experiences undergone, not (pre-)determined by them. For this reason, it is

481   appropriate to say that wayfarers do not know *more* as they go, implying the storage of secondary

482   information to be rolled off in future states, but that they know *better*, manifest through an ever-

483   attuned coupling of perception and action to the informational ebbs and flows of a dynamic

484   environment that is never the same from moment to moment.

485   To exemplify, the flow of the various works cited within our prologue that 'we' (the broader authorship

486   team) have written in recent years has a temporality similar to the durational rhythmicity described

487   here. These works are not perfectly synchronised, each precisely picking up where the other left off

488   like a sequence of instants forming a pre-programmed network of literature. Rather, each are

489   imperfect knots, that when threaded together, form a broader *meshwork* of inquiries (Ingold, 2011;

490   Woods, 2021). What makes these knots imperfect is that they consist of *loose ends*, each slightly

491   different to those gone before, given the varied experiences we have undergone in their threading

492   (Woods & Davids, 2022). This imperfection, though, is not something to be artificially smoothed over,

493   nor should it be looked upon negatively, as it is precisely in these loose ends where possibilities of

494   carrying the meshwork on *open up*. After all, if these works did in fact precisely fit in place, connecting

495   up to generate a 'watertight network', then there would be nowhere further for us to go[9]. Accordingly,

496   what sustains our growth as sport scientists in-becoming, is not a metronomic sequencing of instants,

497   but a rhythmic weaving of threads; an ongoing duration that has led us to where we are now.

498   *Wayfaring is animated in what we 'do'*

499   To the wayfarer, life is unscriptable. It cannot be codified into systems of classification waiting to be

500   passed on into the receptable mind of other. This is because a hardened system of classification cannot

501   pin down a fluid reality. For the wayfarer to carry on, they have to join with these formative processes,

502   attentively responding to ongoing changes in both environing and task dynamics. Though, while life

503   may indeed be unscripted and unscriptable, it does not seem to preclude organisations, institutions

504   or governing bodies from attempting to script it through the establishment of rules, plans and

505   conventions that seek to control the functioning of others, oft in the name of efficiency (Reed, 1996).

506   Think, for example, of the common myth in sports coaching that people must learn the 'fundamentals'

507   of a game – fitting in by replicating prior-established 'ways of moving' – before they can 'efficiently'

508   and 'correctly' play it (see Rudd et al., 2021). Skilled response, though, is not attributed to the passive

509   following of rules or the rigid following of a plan. It requires a tight coupling of perception and action

510   to the most subtle of changes in task and environing conditions, a coupling that can only be learnt by

511   *doing for oneself* (Ingold, 2013, ch. 1). What distinguishes a skilful practitioner from their novice

512   counterpart, then, is not a mind filled with codified knowledge about their respective task specifying

---

[9] See Ingold (2014, p. 390) for a critique detailing the pitfalls of an "interconnected world".

513   for them about 'how to do'. But an attentiveness that sees them respond to, and join with, the

514   unfolding task dynamics with care, sensitivity, precision and dexterity.

515   This is a distinction denoted through what design theorist David Pye (1968) referred to as the

516   'workman of certainty' and the 'workman of risk'. The former is indicative of transport, in which one

517   proceeds across a pre-determined route toward a destination identified prior to departure. For the

518   workman of certainty, movements are mechanically constrained by autonomously following what has

519   been prescribed for them. This means that they "cannot alter course in mid-flow, but must stop, alter

520   the settings of the apparatus, and start again" (Ingold & Hallam, 2007, p. 13). Changes in one's

521   direction of travel can thus be surmised as a series of stop/starts: stopping to match what one is doing

522   against how it 'should' be done, adjusting what is needed, and then starting their sequence of

523   movement again. The latter, however – the workman of risk – is the way of the wayfarer. They

524   carefully respond to the unfolding ebbs and flows of a crescent world in order to keep going.

525   Importantly, this response is not just embodied, but *animated in-motion* (Sheets-Johnstone, 2010).

526   This means that the workman of risk appreciates that at any moment, their task could alter course,

527   requiring them to dexterously and adaptatively respond *as* they go (Bernstein, 1967). There is a

528   submission in this dexterous response, an appreciation that in a crescent world, perceived control is

529   a falsity, even in seemingly repetitive tasks. This is crucial for the wayfarer, as it is what keeps them

530   openly responsive to the unfolding fluctuations of the task and environment.

531   As noted within our prologue, I (the first author) did not plan or set out to be 'here'. In fact, when

532   questioned about my 'five-year research plan', I have shared feelings of unease and confinement (cf.

533   Woods et al., 2022b). This, though, should not be misconceived as aimless drifting. I do have an

534   intended direction of travel, just not a pre-determined route or an end in mind. Leaning again on the

535   process of this paper's coming-into-being, we did set out to challenge conventions related to 'potential

536   fulfillment'. We did not, however, script the paper in advance, nor collage sections together, as though

537   they were written independently waiting to be inserted in their correct place. We have been figuring

538 out conceptualisation, meaning and communication as we have gone, manifest in weaving words into

539 words, sentences into sentences, paragraphs into paragraphs. In realising these smaller-scaled

540 affordances while working, we concurrently held open the larger-scaled opportunity to keep the paper

541 going in a direction determined as we went. Perhaps it is appropriate to view the 'page' you are

542 reading, then, in its Latin origin – *pagus*; an inhabited countryside (Illich, 1991) – with our writing being

543 the tracks formed as we have found our way through. Doing so would mean that our paper has literally

544 animated its very message – navigating not toward a point of fulfilment, as though we started with it

545 already completed, but wayfaring along an undulating path formed as we have gone, established in

546 and by our *doing together*. It is only now, in looking back, that we are able to see the path left behind,

547 a path that others may or may not want to follow. Wayfaring, thus, is animated in what people 'do',

548 *precisely because what people 'do' is always open to possibility in a crescent world*.

549 **Concluding remarks**

550 Here, we set out to challenge conventional interpretations of what it means to fulfill one's potential.

551 Specifically, it was proposed that life is not a process of 'filling up' the innate with the acquired, but

552 one of 'opening up', corresponding with the coming-into-being of affordances encountered along the

553 way. Leaning on Ingold's notion of wayfaring, this idea led us to situate life as an ongoing rhythmic

554 procession, of skilfully moving through a crescent world open to possibility. It would be remiss, and

555 perhaps even contradictory, to now suggest that our paper is coming to an end. For in doing so, we

556 would risk tying off any loose ends exposed, proclaiming that this paper is 'done', 'complete', there is

557 nowhere further for it to go. The reality is that while its writing is coming to a pause, the paper is

558 positioned to now be responsively cast out into the world, waiting to be joined with by attentive others

559 who happen to stumble into it while moving along their path of growth. As Withagen and colleagues

560 (2012, p. 254) note, inhabiting a diverse affordance landscape provides multiple opportunities for

561 system trajectories with 'inviting potential', contrasted with a (de)'limited' affordance landscape,

562 replete with prescribed pathways to pre-determined outcomes. Maybe it is best to think of our paper

563   in similar terms? Not as coming to an end – a 'prescribed outcome' – but as an affordance with 'inviting

564   potential' that is on its way in becoming something else?

565   As a departing note, we wish to return to our journey as sport scientists in-becoming, following not

566   the objects of convention, but corresponding with things of curiosity. Where is this correspondence

567   to lead us next? While we have a direction of travel, this is a question we cannot answer, as where we

568   are going is somewhat uncertain, open to the possibility of what could come-into-being. There is a

569   trepidation associated with this openness and uncertainty, a risk that at any moment, our journey

570   could alter. Though, this trepidation is not because we are trying to 'stay the course', impatiently

571   moving toward a point of fulfilment *as* sport scientists. To us, such a point does not even exist. Rather,

572   our trepidation can be traced to our itchy feet, our eagerness to carry on, to pack up our tents and

573   responsively follow the scent of what comes-into-being on the horizon, guided by experiences

574   undergone. After all, in a crescent, unscripted world replete with things on the move, there are no

575   dead ends, just renewed beginnings, further opportunities to get to know that which is of interest to

576   us better than before. Echoing the eloquently inspiring words of Tim Ingold with which we opened:

577   what matters in life is not the final destination, but all the interesting things that occur along the way.

578   For *wherever you are, there is somewhere further you can go*. Best then, we carry on.

579   **Acknowledgements**

580   NA

581   **Disclosure statement**

582   No potential conflict of interest was reported by the authors.

583   **References**

584   Bergson, H. (1911). *Creative evolution* (trans A. Mitchell). Macmillian.

585   Bernstein, N. A. (1967). *The co-ordination and regulation of movements*. Pergamon Press.

586   Blumberg, M. S., & Wasserman, E. A. (1995). Animal mind and the argument from design. *American*

587   *Psychologist, 50*(3): 133-144. doi: 10.1037/0003-066X.50.3.133

588   Bouzenita, A. I., & Boulanouar, A. W. (2016). Maslow's hierarchy of needs: An Islamic critique.

589   *Intellectual Discourse, 24*(1): 59-81

590   Camiré, M. (2022). Assemblage thinking as attunement to race, gender, and sexuality. Journal of Sport

591   and Social Issues. doi: 10.1177/01937235221134611

592   Davids, K., & Araújo, D. (2010). The concept of 'organismic asymmetry' in sport science. *Journal of*

593   *Science and Medicine in Sport, 13*(6): 633-640. doi: 10.1016/j.jsams.2010.05.002

594   Dawkins, R. (1999). Forward. In S. Blackmore (Ed.), *The meme machine* (pp. vii-xx). Oxford University

595   Press.

596   Despret, V. (2013). Responding bodies and partial affinities in human-animal worlds. *Theory, Culture*

597   *& Society, 30*(7/8): 51-76. Doi: 10.1177/0263276413496852

598   Dewey, J. (1934/2005). *Art as experience*. Perigee: New York.

599   Gibson, J. J. (1975). Events are perceivable but times is not. In J.T. Fraser, N. Lawrence (Eds.), *The Study*

600   *of Time II* (pp. 295-301). Proceedings of the second conference of the international society for the

601   study of time.

602   Gibson, J. J. (1979/2015). *The ecological approach to visual perception*. Houghton Mifflin: Boston

603   Geertz, C. (1973). *The interpretation of cultures: Selected Essays*. Basic Books, Inc.: New York

604   Heft, H. (2007). The social constitution of perceiver-environment reciprocity. *Ecological Psychology,*

605   *19*(2): 85-105. doi: 10.1080/1040710701331934

606   Heft, H. (2013). An ecological approach to psychology. *Review of General Psychology, 17*(2): 162-167.

607   doi: 10.1037/a0032928

608   Heidegger, M. (1971). *Poetry, language, thought* (A. Hofstadter, Trans.). Harper and Row

609   Henry, E. (1997). Toward a "feeling for the organism". NWSA Journal, 9(3): 156-162. doi:
610   10.2979/NWS.1997.9.3.156

611   Hutchins, E. (1995). *Cognition in the wild*. MIT Press.

612   Illich, I. (1991). *In the mirror of the past: Lectures and addresses 1978-1990*. M. Boyars: London

613   Ingold, T. (1998). From complementarity to obviation: on dissolving the boundaries between social
614   and biological anthropology, archaeology and psychology. *Zeitschrift für Ethnologie. 123*(1): 21-52

615   Ingold, I. (2000). *The perception of the environment: Essays on livelihood, dwelling and skill*. Routledge:
616   London and New York.

617   Ingold, T. (2004). Two reflections on ecological knowledge. In G. Ortalli, & G. Snga (Eds.), *Nature*
618   *knowledge: ethnoscience, cognition, identity* (pp. 301-311). Berghahn, New York

619   Ingold, T. (2007). *Lines: A brief history*. Routledge: New York and London.

620   Ingold, T. (2016). On human correspondence. Journal of the Royal Anthropological Institute, (N.S.)23:
621   9-27. https://doi.org/10.1111/1467-9655.12541

622   Ingold, T. (2011). *Being alive: Essays on movement, knowledge and description*. Routledge: London
623   and New York

624   Ingold, T. (2013). *Making: Anthropology, archaeology, art and architecture*. Routledge: London and
625   New York

626   Ingold, T. (2015). *The life of lines*. Routledge: London and New York

627   Ingold, T. (2016). That's enough about ethnography! *Hau: Journal of Ethnographic Theory, 4*(1): 383-
628   395. doi: https://dx.doi.org/10.14318/hau4.1.021

629   Ingold, T. (2018). *Anthropology and/as education*. Routledge: London and New York.

630   Ingold, T. & Hallam, E. (2007). Creativity and cultural improvisation: an introduction. In E. Hallam, & T.

631   Ingold (Eds.), *Creativity and cultural improvisation* (pp. 1-24). Berg.

632   Jackson, M. (1996). *Things as they are: new directions in phenomenological anthropology*. Indiana

633   University Press.

634   Juarrero, A. (2023). *Context changes everything: How constraints create coherence*. MIT Press.

635   Kashima, Y. (2008). A social psychology of cultural dynamics: examining how cultures are formed,

636   maintained, and transformed. Social and Personality Psychology Compass 2(1): 107-120. doi:

637   10.1111/j.1751-9004.2007.00063.x

638   Lave, J. (1990). The culture of acquisition and the practice of understanding. In J. W. Stigler, R. A.

639   Shweder, & G. Herdt (Eds.), *Cultural psychology: essays on comparative human development* (pp. 309-

640   327). Cambridge University Press.

641   Maslow, A. H. (1962). *Toward a psychology of being*. D Van Nostrand

642   Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). Harper & Row.

643   McGregor, S. L. T. (2015). The Nicolescuian and Zurich approaches to transdisciplinarity. *Integral*

644   *Leadership Review, 6(*16): 1-11

645   Menzies, H. (2014). *Reclaiming the commons for the common good*. New Society Publishers.

646   Morris, C., Davids, K., & Woods, C. T. (2022). On the wisdom of *not*-knowing: Reflections of an Olympic

647   canoe slalom coach. *Sport, Education and Society*. doi: 10.1080/13573322.2022.2140135

648   Narvaez, D. (2018). *Basic needs, wellbeing and morality: fulfilling human potential*. Palgrave Pivot

649   Cham.

650   Oyama, S. (1985). *The ontogeny of information: developmental systems and evolution*. Cambridge

651   University Press.

652   Reed, E. (1996). *The necessity of experience*. Yale University Press: New Haven

653   Rouse, J. (1987). *Knowledge and power: towards a political philosophy of science*. Cornell University

654   Press: New York.

655   Rubin, D. (1988). Go for the skill. In U. Neisser & E. Winograd (Eds.), *Remembering reconsidered:*

656   *Ecological and traditional approaches to the study of memory* (pp. 374-382). Cambridge University

657   Press.

658   Rudd, J., Foulkes, J., O'Sullivan, M., & Woods, C. T. (2021). A 'fundamental' myth of movement with a

659   'functional' solution. In A. Whitehead & J. Coe (Eds.), *Myths of Sport Coaching* (pp.). Sequoia Books.

660   Sperber, D. (1996). Explaining culture: A naturalistic approach. Blackwell Publishing

661   Thelen, E, (1995). Motor development: A new synthesis. *American Psychologist, 50*(2): 79-95. doi:

662   10.1037/0003-066X.50.2.79

663   Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. H. Barkow, L. Cosmides,

664   & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 19-

665   136). Oxford University Press.

666   Turnbull, T. (2008). Knowledge systems: local knowledge. In H. Selin, (Ed.), *Encyclopaedia of the history*

667   *of science, technology, and medicine in non-western cultures* (p. 1198-203). Dordrecht: Springer.

668   van Dijk, L. (2021). Psychology in an indeterminate world. Perspectives on Psychological Science, 16(3):

669   577-589. doi: 10.1177/1745691620958005

670   Withagen, R., de Poel, H. J., Araújo, D., & Pepping, G.-J. (2012). Affordances can invite behavior:

671   Reconsidering the relationship between affordances and agency. *New Ideas in Psychology, 30*(2), 250–

672   258. doi: 10.1016/j.NEWIDEAPSYCH.2011.12.003

673   Woods, C. T. (2021). *Toward Ithaka*: hiking along paths of knowing *of/in* an ecologically dynamic world.

674   *Sport, Education and Society*. doi: 10.1080/13573322.2021.1994939

675   Woods, C. T., & Davids, K. (2022). Thinking through making and doing: sport science as an art of

676   inquiry. *Sport, Education & Society*. doi: 10.1080/13573322.2022.2054792

677   Woods, C. T., Araújo, D., & Davids K. (2022a). Joining with the conversation: Research as a sustainable

678   practice in the sport sciences. *Sports Medicine – Open, 8*(102). doi: 10.1186/s40798-022-00493-0

679   Woods, C. T., McKeown, I., Araújo, D., & Davids, K. (2022b). Wayfinding through boundaries of

680   knowing: professional development of academic sport scientists and what we could learn from an

681   ethos of amateurism. *Sport, Education & Society*. doi: 10.1080/13573322.2022.2071861

682   Woods, C. T., Rudd, J., Araújo, D., Vaughan, J., & Davids, K. (2021). *Weaving lines of inquiry*: Promoting

683   transdisciplinarity as a distinctive way of undertaking sport science research. *Sports Medicine – Open,*

684   *7(*55). doi: 10.1186/s40798-021-00347-1

685   Woods, C. T., Rudd, J., Robertson, S., & Davids, K. (2020). Wayfinding: How ecological perspectives of

686   navigating dynamic environments can enrich our understanding of the learner and the learning

687   process in sport. *Sports Medicine – Open, 6*(51). doi: 10.1186/s40798-020-00280-9