



## Article

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**Research and Practice in Talent Identification and Development – Some Thoughts on  
the State of Play**

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**Running Head:** The State of Play in Talent Identification and Development

17

**Abstract**

18 Although there has been considerable growth in talent identification and development  
19 research, the mixed quality and lack of applied focus means little has changed in the field.

20 We propose the Performance-Outcome-Process continuum, a structure which examines ideas  
21 based on what and how they contribute to the talent development process. Reflecting a  
22 pracademic focus we highlight the importance of understanding the processes and  
23 mechanisms of development-focused constructs to best bridge the research-practice divide.  
24 We suggest a pragmatic approach that prioritises the quality of research and the importance  
25 of applied impact; at least in research which claims to be *for* sport.

26 **Lay Summary:** To bridge the research-practice divide in Talent Identification and  
27 Development, it is important that translational and pragmatic research becomes the norm,  
28 with progression from the retrospective studies which have been typical in this domain.  
29 Focusing on the processes and mechanisms that generate *comprehensive* development would  
30 seem a logical step especially for investigations that want to make a difference in applied  
31 settings.

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35 Research and Practice in Talent Identification and Development – Some Thoughts on the  
36 State of Play

37 The last 25 years has seen a concentration of research in Talent Identification and  
38 Development (TID). Unfortunately, as we will argue, the mixed quality and unclear applied  
39 focus of much of this research, together with organisational inertia on the part of many  
40 National Governing Bodies and associated agencies, means that relatively little has changed  
41 in the TID landscape at a systems level compared to what we know on the basis of empirical  
42 evidence. Indeed, we contend that even *quality* research has found it difficult to infiltrate  
43 applied practice in sport. For example, early specialisation (Güllich, 2014; Moesch, Trier-  
44 Hauge, Wikman, & Elbe, 2013), “snapshot” talent identification protocols (Abbott, Button,  
45 Pepping, & Collins, 2005), and an emphasis on the accumulation of deliberate practice  
46 (Ericsson, Krampe, & Tesch-Romer, 1993) continue to be common approaches to TID across  
47 many sports despite the significant evidence countering these ideas (e.g., Baker, Schorer, &  
48 Wattie, 2017).

49 From a methodological viewpoint, we would suggest that the quality of some research  
50 and, particularly, the ongoing use of single methodologies explains the gap between research  
51 and practice. These methodological decisions may well be due to a *perhaps* inevitable  
52 difference between research focused primarily on application and that for more directly  
53 academic purposes: what Collins and Kamin (2012) refer to as science *for* sport as opposed to  
54 science *of or through* sport. Our point here is that, whilst certain research can be well  
55 designed and impactful in addressing its specified research questions (e.g., interview-based  
56 studies of elite performers; Hardy et al., 2017; or research examining the accumulation of  
57 deliberate practice; Ericsson et al., 1993), it may be less effective in informing practice. In  
58 this respect, it is unfortunate that the applied merit of research continues to be under-  
59 emphasised in debates on research quality. For example, whilst Levitt, Motulsky, Wertz,

60 Morrow, and Ponterotto describe integrity in qualitative research as “whether the  
61 implementation of fidelity and utility function coherently together” (p.2, 2016), their meaning  
62 of utility seems more related to research that achieves its academic goals rather than the  
63 actual applied value (another important type of utility) of these goals in the first place.  
64 Indeed, past and present discussions (e.g., Sparkes & Smith, 2009) have tended to focus on  
65 improving the *process* and *internal coherence* of research rather than improving its *purpose*  
66 and *external impact*. This difference is important, especially if work in TID is to be  
67 considered as an applied science. At the very least, the highly *individual* perspective  
68 described in autobiographical (e.g., Howell & Fletcher, 2015) and some qualitative research  
69 (e.g., Collins, MacNamara, & McCarthy, 2016; Hardy et al., 2017) would seem questionable  
70 as the *sole* basis for advising practitioners on how to work *generally* with athletes. We would  
71 also argue that TID now needs to progress from research replicating outcomes already shown  
72 in the literature (e.g., Hardy et al., 2017) towards translational work that bridges the gap  
73 between research and practice. Of course, replication focused on real, practically meaningful  
74 findings is very useful but we would argue that overcoming the methodological limitations of  
75 TID studies and identifying ways to use research to improve TID practices should be the key  
76 consideration moving forward, at least for those espousing an applied focus. Therefore, it  
77 seems timely to consider the current focus within TID research, proposing future directions,  
78 and methodological approaches to bridge the gap between research and practice in order to  
79 conduct research “that makes a difference”.

## 80 **A Structure for Ideas: The Performance - Outcome - Process (POP) Structure**

81 As a first step in addressing the research-practice divide, we would like to suggest a  
82 structure which can be applied to the myriad approaches which exist within TID and related  
83 areas. The idea being to situate findings within a structure of how they contribute to the  
84 overall process of TID, thus providing practitioners with evidence-based recommendations

85 about the processes and outcomes that lead to the desired performance. The Performance-  
86 Outcome-Process (POP) continuum looks at ideas within a hierarchy, based on what and how  
87 they contribute to the TID process. We start at the top of the continuum with performance;  
88 specifically, what the goal is when working with athletes<sup>1</sup>.

89         **Performance.** The ultimate aim of any talent pathway is to develop athletes with the  
90 ability to perform at the highest level. This focus on *eventual* performance has resulted in a  
91 body of research that has examined the multiple factors associated with successful  
92 development (e.g., Ericsson et al., 1993; Philips, Davids, Renshaw, & Portus, 2010; Tucker &  
93 Collins, 2012). In practical terms, however, such information with a developmental focus  
94 (i.e., “performance later”) is often confused with empirical findings concerned with  
95 “achievement now”. For example, coaches are often trained towards the generation of  
96 performance now (Visek et al., 2015) and such success can certainly bring some reputational  
97 capital. Being successful in front of your coaching peers is clearly important within the  
98 social structures which play such a large part in coaching communities (Jones, 2000;  
99 Stoszowski & Collins, 2012). This is to some extent understandable; the time lag between  
100 coaching a young promising athlete and his/her eventual success at senior level can be long  
101 and human nature prefers more immediate gratification. Our point here is that, for a variety  
102 of reasons, talent development (TD) requires a different mindset, approach, community and  
103 overall organisational structure than doing what most coaches are normally trained to do –  
104 WIN. Of course, some sports are recognising this through the implementation of specifically  
105 development-focused training (e.g., the FA’s Advanced Youth Award) but there is still a need  
106 for a culture change in TD circles in terms of talent. So, for the present purpose, coaches,  
107 researchers and organisations need to be very clear about what they are working to achieve.

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<sup>1</sup> For the purpose of this paper, athlete is used to cover any performer within a physical task performance pathway (e.g., sport, dance)

108 In crude terms, performance today *or* tomorrow may be the choice needed, albeit that the  
109 balance may sensibly be changed systematically as players progress up the pathway (cf.  
110 Webb et al. 2016).

111 **Outcome.** Once the exact performance target has been specified, the next challenge  
112 is to decide on the outcome deliverables which will take the athlete there. In our experience,  
113 these can be seen as falling into two groups, with some overlap between the two. The first  
114 can be thought of as taxonomies of characteristics needed for the target performance in  
115 question. Some are empirically based, such as the “11 Model” in football, developed by  
116 Jordet (2016). Others have been developed by working groups of coaches, such as the  
117 CARDS model used by the RFU (England Rugby, 2017). In such cases, the models offer an  
118 outcome-focused curriculum towards which TID coaches can work. Notably, these models  
119 often include psychological constructs; for example, coping with pressure in the 11 Model or  
120 resilience within the CARDS model. Additionally, and presumably, these characteristic  
121 taxonomy models would claim to address the essential list of “what it takes” to be successful,  
122 given that success (i.e., performance in our POP structure) is operationalised in these cases  
123 as future achievement.

124 Our suggested second category of outcome deliverables is built around specific  
125 psychological constructs, deemed causative of the target performance. Such examples  
126 include grit (Duckworth, Peterson, Matthews, & Kelly, 2007), the growth mindset (Dweck,  
127 2017), resilience (Seligman, 2011; Sarkar & Fletcher, 2016), and self-control (Toering &  
128 Jordet, 2015). The constructs in this second category often contain elements of both trait and  
129 contextual behaviour, suggesting that training may build both the tendency to habitually  
130 apply them and the skill to apply them to novel contexts. Albeit individual constructs rather  
131 than broader taxonomies, the idea is again that these outcomes allow individuals to make it to  
132 the top.

133           We would like to make two points about these outcome models and their place in the  
134 existing and emerging research picture: firstly, how they may fail to address the full picture  
135 and secondly, a consideration of ways in which these outcomes are achieved. First of all,  
136 consider the validity of the models and constructs proposed. We would suggest that, of those  
137 listed above, only the 11 Model could have some claim to represent a *comprehensive* list of  
138 the skills needed. Of course, all the models are clearly and definitely valuable, and ongoing  
139 research from a variety of sources adds to the evidence for their utility – *none of which we*  
140 *question*. But are any of them the whole or even a large part of the picture? We would  
141 suggest not. The challenges documented by pathway athletes are widely varied, suggesting  
142 that any of the aforementioned constructs would not *solely* prepare the athlete for the whole  
143 pathway.

144           Secondly, we would suggest that all the constructs will need some skills to be taught  
145 and practised before they can be relied on to work “under fire” and in response to  
146 developmental challenge – a position which is perhaps in contrast to some other work. It is  
147 true that some research suggests, or at least intimates, that development accrues *as a direct*  
148 *consequence* from challenge. In other words, if I suffer trauma then the inevitable outcome is  
149 a bunch of skills which help me make it to the top. In one such study, Van Yperen (2009)  
150 showed that footballers who eventually made it to the elite level were significantly higher in  
151 acknowledged “challenge” factors such as number of siblings, minority ethnicity and  
152 divorced parents than those who did not achieve at the highest level. Other studies have used  
153 autobiographical and biographical accounts (Fletcher & Sarkar, 2012; Sarkar & Fletcher,  
154 2014) or detailed retrospective interviews (e.g., Hardy et al., 2017) to demonstrate the role of  
155 life experiences, adversity, and trauma in particular, in the development of elite athletes. We  
156 would have to question this finding from both methodological and applied perspectives,  
157 citing the importance of what athletes *bring to* the challenges (Savage, Collins, &



158 Cruickshank, 2017), learn from prospective training (Fletcher & Sarkar, 2016), or post hoc,  
159 supportive debriefs (Joseph, Murphy & Regel, 2012). These points are important because for  
160 every one person who survives or benefits from childhood trauma, there would seem to be a  
161 lot more who crash and burn.

162 We have made these points before (Collins et al., 2016) but reiterate them here as  
163 crucial to the development of *comprehensive* skillsets in TID athletes. In short, we would  
164 suggest that no one construct or model mentioned in the Outcome section above offers either  
165 the comprehensive skillset required or enough detail on how this could and should be  
166 developed. Though undoubtedly important, being resilient, gritty, or having a growth mindset  
167 cannot therefore be the whole answer. Instead, understanding, then teaching and refining a  
168 broad range of generic skills in young people, which they can then apply to the different  
169 challenges of development, would seem a sensible way forward. Hence, we turn to the third  
170 and underpinning level of our POP structure - process.

171 **Process.** Reflecting a pracademic focus, and the need to generate effective and  
172 applicable answers to TID issues, we propose an emphasis on the mechanisms and processes  
173 that underpin the young athlete's ability to make the most of the developmental opportunities  
174 they are afforded. Extending from our arguments above, these processes must be both  
175 comprehensive (i.e., cater for the full range of challenges and contexts) and proactively  
176 developable as the athlete proceeds along the pathway. For example, incremental theories  
177 (such as growth mindset, which sees ability as something which can be grown) may be best  
178 applied through an understanding of how they operate and the processes that underpin the  
179 outcome behaviours. In this regard, growth mindset may relate to, or even be a product of,  
180 self-regulatory learning (e.g., Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013) while  
181 grit's positive effects are thought by some as attributable to perseverance, which is itself  
182 related to motivation and self-drive (Credé, Tynan, & Harms, 2017). As such, we would

183 highlight the importance of understanding the processes and underlying mechanisms of  
184 development-focused constructs to best support the integration of these ideas into applied  
185 TID procedures. In short, understanding the *skills* that athletes need to achieve a growth  
186 mindset or be gritty.

187         In regard to this skills development approach, we have tested for, refined and  
188 proposed (see Collins & MacNamara, 2017a) the systematic teaching, testing and tweaking of  
189 a set of essential skills, the Psychological Characteristics of Developing Excellence (PCDEs),  
190 as a logical way to prepare young people for the “ups and downs” of development. This set  
191 of empirically derived skills (MacNamara, Collins, & Button, 2010) are proactively  
192 developed through a teach then test and refine approach, offering young athletes a toolbox  
193 with which they have practised and are confident in using to counter a variety of challenges,  
194 both real and contrived (Collins & MacNamara, 2017b). The skill set involved has been  
195 shown to be comprehensive enough to help athletes cope with, and optimally benefit from,  
196 the range of challenge inherent in their pathway (Collins & MacNamara, 2017a). In short,  
197 focusing on the process and teaching the skills whilst building on experiences, both planned  
198 or naturally occurring, can generate growth mindset, grit, and/or resilience as the  
199 aforementioned outcome deliverables.

200         In completing the proposal of this POP structure, it is important to acknowledge that  
201 several solutions are possible. We would clearly not claim a monopoly on truth with the  
202 PCDE model; different, and more appropriate, lists for specific contexts may be proposed.  
203 Indeed, we regularly review and refine this list by, crucially, using a combination of research  
204 and in-the-field experience with athletes and TID practitioners. Consequently, the current list  
205 of PCDEs (i.e., commitment, focus and distraction control, realistic performance evaluations,  
206 self-awareness, coping with pressure, planning and self-organisation, goal-setting, quality  
207 practice, effective imagery, actively seeking social support) are the result of over 20 years of

208 research and field testing. In our (e.g., Collins & MacNamara, 2017a) and others' (e.g.,  
209 Newton & Holmes, 2017) experience, the approach works very well. We would hope that  
210 future comprehensive lists build on this rather than "reinvent the wheel". We also recognise  
211 that several of the PCDEs can be criticised as "chicken or egg" constructs. So, is resilience a  
212 crucial omission from the list or can it be achieved through using a combination of skills  
213 selected from the "hand of cards" which is how the PCDEs are taught (cf. Collins et al.,  
214 2016)? Our point here is more one of principle and reflects the POP model presented earlier.  
215 Namely, that TID research must equip practitioners with a comprehensive toolbox and the  
216 means to develop and facilitate a comprehensive skillset in athletes. Based on this  
217 philosophical but ecologically valid stance, we would see the common current practice of  
218 pursuing one or other sole construct as epistemologically flawed.

### 219 **Methodological Progressions for TID Research**

220 As our second opportunity for improvement in this "state of the nation" review, it is  
221 also important to consider the ways in which research is conducted to inform TID processes  
222 and systems. The vast majority of research in TID, at least those studies focused on the  
223 psycho-behavioural and psycho-social factors associated with development, adopt a  
224 qualitative approach (e.g., Bjorndal & Ronlan, 2017; Henriksen, Larsen, & Christensen,  
225 2014; Hill, MacNamara, & Collins, 2015). Typically, retrospective interviews are conducted  
226 with elite athletes who are asked to reflect on their career trajectory. This approach  
227 dominates since it is impossible to predict which young performer will reach the highest level  
228 in his or her activity, and therefore one can only identify outstanding athletes "after the fact"  
229 (Côté, Ericsson, & Law, 2005, p. 15). While these studies have provided a useful starting  
230 point for examining TID, there are a number of methodological limitations that must be  
231 acknowledged (e.g., self-report bias, hindsight bias; Coolican, 2004). Of most concern from  
232 the applied perspective is the accuracy and quality of data presented and then used to inform

233 TID practices. For example, when using retrospective recall, respondents are likely to recall  
234 only a small number of vivid experiences that may, but also may not, be genuinely  
235 representative of their developmental trajectory (cf. Brown & Kulik’s flashbulb memories,  
236 1977). The recall of these vivid memories is also liable to be influenced by implicitly  
237 aggregating many years of accumulated experience as well as an integration of current  
238 attitudes and behaviours (Côté et al., 2005). These limitations can be managed by concrete  
239 attempts to ensure that participants recount their experiences relevant to particular stages of  
240 development. For example, both early (MacNamara et al., 2010) and more recent (Howells  
241 & Fletcher, 2015) retrospective studies have used a graphic time-line to break down the  
242 individual’s career into stages using salient temporal boundaries. This approach  
243 notwithstanding, our main point is that the long-term memory of some individuals alone is  
244 not the most stable of data sources through which to inform general TID practices for others.  
245 Unfortunately, however, it is precisely this type of data on which many TID studies – and  
246 implications for practice – have been based.

247         Although the accuracy of recall information from personally interviewed participants,  
248 especially when conducted retrospectively and without concrete questioning and coding  
249 structures, may be relatively unreliable as a source to generalise to others, the systematic bias  
250 inherent in the recall of autobiographical information may be of even greater concern. Ross  
251 (1989) suggests that this bias is the result of reconstruction and inferences, with participants  
252 (both the performer and the researcher) relying on their current feelings, attitudes, and  
253 situations to extrapolate what they think they might have thought or experienced at earlier  
254 stages of their careers. Given these issues, it is surprising to see athlete autobiographies used  
255 as the *sole* data source in some recent studies of elite athletes (e.g., Howells & Fletcher,  
256 2015) given that “autobiographies, rather than seeking historical accuracy or objective truth,  
257 seek to offer deep insights into subjective expressions of experience . . . [and] emphasize not

258 facts, but personal experiences and personal lives as cultural constructions” (Stewart, Smith,  
259 & Sparkes, 2011 p. 583). Simply, autobiographies do not attempt to relate back to the  
260 general experience of others and therefore their purpose is more self-serving rather than  
261 science-serving. Indeed, and with reference to Levitt et al.’s (2016) assertions noted earlier,  
262 autobiographical studies may certainly yield “hi-fidelity” data but their utility to drive  
263 tomorrows’ practice must be carefully considered. In short, TID is a complex situation which  
264 is unlikely to be well addressed by reading a filtered account of an athlete’s own memories  
265 and perceived experiences (Freeman, 2001), often ghost-written to persuade the audience,  
266 raise the author’s profile and for financial gains rather than to capture the truth of the  
267 experience and inform system-level change. Of course, as some qualitative research gurus  
268 have suggested (Sparkes & Stewart, 2016), these techniques do offer an insight into the  
269 individual’s reflections on her or his experience. However, following from our earlier  
270 comments on the focus of the research (science for sport or science of, and, through sport),  
271 surely trustworthiness and generalisability are also valid issues? Furthermore, the  
272 retrospective nature of these data (i.e., retrospective interviews and autobiographical studies)  
273 means that the status of the athlete will influence their perception of the route to the top;  
274 those who do not make it to the top of their sport are likely to regard certain developmental  
275 challenges differently than their more successful counterparts. As such, the athlete’s eventual  
276 success will undoubtedly colour their perception of the pathway and this impression  
277 management and bias might be even more of a factor for athletes still involved in the sport.

278         The key point here is the need to question the use of “single” methodologies in many  
279 TID studies and go beyond post-hoc descriptions of athletic careers. We are very aware of  
280 this as a potential shortcoming having conducted studies of this nature ourselves and have  
281 subsequently stressed the need for triangulation of multiple measures across studies (Collins,  
282 MacNamara, & McCarthy, 2016; Collins & MacNamara, 2017a). In this regard, the use of

283 the transdisciplinary approach employed by Toohey, MacMahon, Weissensteiner et al.  
284 (2017), where a team of different disciplines work together on TID issues (using multiple  
285 methods across studies), would seem one obvious, if overdue, answer.

### 286 **Where Next? The Need for a New “Tolerance” in Pragmatic Research**

287 In order to close the research-practice divide in TID research, we suggest a pragmatic  
288 approach that prioritises both the quality of research and the importance of applied impact; at  
289 least in research which claims to be *for sport* (Giacobbi, Poczwardowski, & Hager, 2005).  
290 Notably, while most research appeals to markers of quality around the technical aspects of  
291 the investigative process, pragmatic research encourages this *and*, more fundamentally, a  
292 consideration of the “so what?” principle (Bryant, 2009, para. 47). In other words, what  
293 difference has the work delivered for improving the lives and actions of those studied?

294 Of course, against this applied emphasis, we are aware that there may firstly need to  
295 be a greater understanding, tolerance, or specific acceptance of pragmatic research in the TD  
296 community. More specifically, the need to better understand how phenomena and  
297 interventions really impact developing athletes should encourage researchers to acquire rich  
298 qualitative data but *in combination* with quantitative approaches that enable future,  
299 generalizable action; or, in the case of any qualitative-only work, approaches that at least  
300 generate more generalizable evidence than typical small sample and, in particular,  
301 autobiography-based work (e.g., the matched-triad design in Collins et al., 2016). Of course,  
302 any mixed methods (or “best of both worlds”) solutions will require careful design if they are  
303 to have optimal methodological integrity (Morgan, 2014). Indeed, the challenges of quality  
304 in mixed methods research must be acknowledged given previously neglected issues  
305 (Sparkes, 2015); especially as results are likely to (or *should*) play a central role in evolving  
306 structures, systems and theory. In this respect, Sparkes (2015) has already highlighted  
307 Mason’s (2006, p.3) earlier assertion that:

308 Researchers engaging in mixed methods research need to have a clear sense of the  
309 logic and purpose of their approach and of what they are trying to achieve, because  
310 this ultimately must underpin their practical strategy not only for choosing and  
311 deploying a particular mix of methods, but crucially also for linking their data  
312 analytically.

313 As well as for researchers, these points also apply to journal editors and reviewers; in short,  
314 the peer-review process must also recognize the logic and purpose of applied, mixed method  
315 studies as this perspective should ultimately underpin the *evaluation* of the described methods  
316 and analysis. Accordingly, and as further suggested by Sparkes (2015), editors and reviewers  
317 will have to judge the quality of the qualitative elements with criteria that are at least in  
318 addition to those espoused in qualitative-only research (e.g., Sparkes & Smith, 2009); in  
319 effect, criteria relating to how well the qualitative parts contribute to advancing practice in  
320 the broader, target population. Of course, pragmatic research, just like every other form of  
321 research, has received some “bad press” and some might argue that it defies principles of  
322 methodological integrity (cf. Sparkes, 2015). However, and just like these other forms of  
323 research, this bad press has not always been accurate or balanced. For example, Sparkes  
324 (2015), drawing on the arguments of Lincoln (2010) and others, has summarised that  
325 pragmatists “are not required to tell us anything about their ontological or epistemological  
326 positions” and “[may] declare that one’s philosophical belief system is irrelevant to how  
327 research gets conducted”. However, while these points might be the case for *some*  
328 pragmatists and *some* research, the pragmatic philosophy *can and does* encourage ontological  
329 and epistemological transparency, as others (e.g., Corbin & Strauss, 2008) and ourselves have  
330 previously attempted to adhere to (e.g., Savage et al., 2017).

331           Returning to the case of TID, we see it as entirely appropriate that qualitative-like  
332 approaches, in conjunction with quantitative-based measures, may therefore be used to offer a  
333 rich but generalizable and practically meaningful picture of developing groups (Johnson &  
334 Onwuegbuzie, 2004). In this regard we concur with Johnson and Onwuegbuzie’s perspective  
335 that “differences in epistemological beliefs (such as a difference in beliefs about the  
336 appropriate logic of justification) should not prevent a qualitative researcher from utilizing  
337 data collection methods more typically associated with quantitative research, and vice versa”  
338 (p. 15). One might consider this as similar to the use of a particular pan-theoretical  
339 technique in applied sport psychology. The same technique may be used by practitioners  
340 from a humanistic, cognitive behavioural or even NLP perspective. The perspective will, of  
341 course, impact on the outcome. However, the tool, whilst it should be clearly situated against  
342 a philosophical approach, can be employed across domains. Again, from a pragmatic  
343 perspective, our suggestion throughout the paper is that the most appropriate mixture of  
344 methods should be used in order to answer important research questions (Maxcy, 2003). We  
345 will examine this broader issue of pragmatic research in a future paper but, for the moment,  
346 triangulation would seem to be an important tool in the pursuit of high utility findings that are  
347 developed primarily *for* TID practice.

348



349           In terms of what pragmatic research should specifically focus on next, we urge  
350 researchers to consider what we need to know to *advance* the field. In order to advance, we  
351 suggest a need for prospective, longitudinal, multi-method, and contextually situated studies  
352 that examine performers' experiences, skills, supports, and roadblocks (a focus on *process* as  
353 defined in the POP model above). Another useful next step would focus on larger cohort  
354 studies that track individuals ("good" and "poor" developers) against group and individual  
355 profiles. For example, if sport-related challenge is an important aspect of the TID journey  
356 (and our and others' work to date suggests strongly that it is) we need to understand the  
357 mechanisms underpinning this phenomenon. The post-traumatic growth literature certainly  
358 suggests that post-event interventions that help people learn from the challenge and counter  
359 the negatives are essential in order to accrue benefits from that experience (Joseph et al.,  
360 2012). It is also important, however, that research investigates the utility of *pre-traumatic*  
361 growth. Essentially, what skills can be developed a priori so that performers can cope, learn  
362 from, and benefit as a result of developmental challenge. In this regard, we suggest a focus  
363 on examining the underlying processes and mechanisms for what is needed to generate  
364 *comprehensive* development, rather than a concentration on particular outcomes such as  
365 resilience or growth mindset. This would seem to offer the best applied information and may  
366 also provide the most parsimonious explanation across the many psychological trait/state  
367 constructs. Of course, there is a clear need to concurrently test the validity of this approach  
368 using longitudinal research designs.

369 Finally, and to address a confusion to which our own work has contributed (Collins &  
370 MacNamara, 2012), there is a need to clarify how *much* trauma is needed for such growth to  
371 occur and where it should come from. Are top performers really made by severe life trauma  
372 as suggested by some researchers (e.g., Sarkar, Fletcher, & Brown, 2015)? Or is a process of  
373 challenge, often sport-related, the best way to support development (e.g., Collins et al.,  
374 2016)? In short, an important question to which better research techniques should be applied  
375 is the extent to which life defining *trauma* or developmentally impactful, acute, and perhaps  
376 *traumatic* phases of challenge impacts development. From a pragmatic point of view we can  
377 see greater implications for practice accruing from the second position in terms of the  
378 qualitative nature of the trauma (e.g., the amount and timing of challenge on the pathway)  
379 and exploiting the pre- and post-challenge experience of the athlete in order to optimise this  
380 experience.

### 381 **In Conclusion**

382 To summarise, we see some exciting possibilities and important next steps for  
383 research, practice, and application in the TID field. In order to advance, prospective,  
384 longitudinal, multi-method, and contextually situated studies are required. Essentially, this  
385 call extends to asking for an increase in translational research – working with and for sports –  
386 that bridges the gap between research and practice, especially in cases where the  
387 investigations want to genuinely make a difference in applied settings. As explored by  
388 several researchers, this may well involve a culture change in the way research in our field is  
389 evaluated. There seems little doubt to us that the impact of “objective evaluations” such as  
390 the UK Research Excellence Framework (REF 2021) have served to change the nature of our  
391 field. The move towards genuinely impactful applied research has recently seen several  
392 institutions advertise for and appoint positions in translational research – a welcome step but  
393 one which needs to gather momentum. In the meantime, and at the other end of the

394 translational spectrum, there has been an exponential growth in blog-based opinion pieces  
395 and twitter gurus as a primary, even preferred source of information (cf. MacNamara &  
396 Collins, 2015). Importantly for the present purpose, only a few of these are active  
397 researchers. Once again, a culture change that sees primary research consumers encouraged  
398 and facilitated to be both acquisitive and critical would seem to represent an important step.  
399 We hope readers with a pracademic orientation will take this paper as both encouragement  
400 and a call to arms, so that even more translational, pragmatic, “make a difference” research  
401 impacts our field.

402

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